Complex and Controversial Causes for the 'Obesity Epidemic': The Role of Marketing Communications

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Abstract

This conceptual paper examines the current controversies surrounding the worldwide increase in obesity rates. We focus on criticisms and marketing/marketing communication activity as a factor that may affect obesity levels, and on the role marketing communication may play in strategies designed to combat obesity.

We have examined academic, practitioner and consumer literature and highlight the following:

- There is no single cause of obesity; there is therefore no single, simple solution.
- The impact of a range of factors believed to have an effect on obesity are poorly understood, with most research demonstrating, at best, some level of correlation.
- A major concern is that correlation is being mistaken for / misreported as causation, with the potential for interventions and 'reforms' to be misdirected and ineffective.
- A further major concern is poor reporting and, at times, outright distortion of research findings both by the media and by extremist lobby groups.

This paper considers all factors that are identified as affecting obesity levels including:

- Television viewing.
- Potentially misleading advertisements.
- 'Junk reporting' of 'junk science'.
- Advertising restrictions, outright bans, and excise taxes.

- Excessive fat consumption.
- The Body Mass Index.
- The role of exercise in childhood and adulthood.
- Parental and family influences.

There is a real danger that well-intended interventions may be put in place to address the obesity issue but will achieve little positive effect. There is also a strong possibility that results may be contrary to what is intended, particularly if these initiatives are put into place in an environment where conflicting messages, sensationalized reporting of pseudo science, and unwarranted accusations of blame will continue to be made. Coordinated multiple strategies are needed, with cooperation between all stakeholders and interest groups.

Introduction

> *"Obesity is not a single disorder. Individuals become obese because of a unique mixture of inherited genes that confer susceptibility and years of complex interactions with an environment that is increasingly more 'obesogenic'…. Preventing it and treating it will require persistence, patience and understanding" (Whitaker, p. 924[1]).*

There is agreement that obesity rates, and associated health problems are increasing worldwide (see, for example Danner and Molony [2]; Sibbald [3]; New Zealand Ministry of Health [4]). Ahmad [5] claims that obesity across adults and children accounts for $40 billion of total treatment costs for heart disease, diabetes, high blood pressure, gallbladder problems and some types of cancers in the USA alone.

There is however, little agreement regarding the exact causes of the growing 'obesity epidemic', although there is a growing recognition that there may be a number of inter-related genetic and environmental factors that contribute to the problem (see, for example, Ebbeling, Pawlak and Ludwig [6]). Further, the widespread assertion that obesity is responsible for a number of deaths annually (some 300,000 annually in the USA alone) may not be as clear-cut as often reported (Gaesser [7]; Kassirer and Angell [8]). However, there is a very real danger that, in criticizing the current focus on weight loss, that obesity and its associated dangers will be trivialized. Nevertheless, the body of evidence supporting the significant health risks of excess weight in the context of overall poor quality lifestyles should not be ignored (Jonas [9]). The quote below perhaps sums up some of the frustrations experienced by those searching for effective solutions.

> *"We are lazy; we overeat; we don't prioritize what is truly important to us in our lives; and we don't have a clue as to the steps involved in making proper fitness a consistent part of our daily and hectic lifestyles" (Jackowski, p.: 60 [10]).*

There is considerable debate regarding possible solutions, but minimal agreement, with calls for advertising bans, taxes on foods perceived as being of low nutrient value among the range of options put forward (Eagle and de Bruin [11]; Ahmad [5]).

This paper builds on the growing literature on the broad range of issues such as diet, exercise, sedentary pursuits such as television viewing and communication of both problems and potential solutions that could be considered by industry and consumers alike. It must be recognized that, as with the causes of obesity, there will not be one

single, simple solution and that gaining long-term attitudinal AND behavioural change is extremely difficult. Our focus is not on morbid obesity, for which the most effective treatments require specialist, often surgical, interventions (see, for example, Martin, Robinson and Moore [12]). We concentrate instead on the marketing communication implications inherent in growing calls for some 50% of populations throughout the world who are classified as overweight (see, for example, New Zealand Ministry of Health [4]) to examine their weight, fitness and overall lifestyles. We briefly examine the discussions and arguments put forward in the academic, practitioner and consumer literature, focusing on reviewing and assessing the potential efficacy of a range of solutions proposed to date. We then focus on the literature regarding the effectiveness of a range of public health communications programmes with a view to providing guidelines for the development of future communications programmes.

The literature reveals considerable speculation and numerous studies that indicate correlation of a range of factors with obesity. It also reveals how little we actually know about the relative impacts of these factors, such as genetics, family influence and lifestyle choices such as diet and physical activity levels (King and Hayes [13]; French, Story and Jeffrey [14]; Martinez [15]; Dietz & Gortmaker [16]). By focusing on one specific potential factor as a presumed 'cause', King and Hayes, p 29 [13]) warn, "We do both children and adults a disservice by presenting 'simple' solutions to these complex issues". It is probable that no single solution exists, and that no intervention will achieve major changes in behaviours in the short term.

An area that warrants further investigation is the growing recognition and debate in the literature that the focus on obesity per se, to the point of 'lipophobia', deep seated anxiety about fat and fatness (see, for example, Askegaard [17]; Tiggemann and Rothblum [18] and associated weight prejudice (Wann [19]). There appears also to be recognition that focusing efforts primarily on the goal of weight loss may be self-defeating (Ebbeling, Pawlak and Ludwig [6]; Cogan and Ernsberger [20]). There is a parallel call for recognition of more holistic approaches to healthy lifestyles and a refocusing on factors such as aerobic fitness and other lifestyle issues rather than on weight loss per se (Elks [21]).

It is of concern that many studies claim, but fail to demonstrate causality between factors studied and obesity. Such studies illustrate at best some level of correlation between such factors as amount of television viewing and body mass index, but are misinterpreted to suggest cause and effect (see, for example, Wilde [22]). Yet 'prospective analyses' that are intended to suggest research agendas that would allow the relative impact (if any) of a range of factors that may impact on obesity (see, for example Ludwig, Peterson and Gortmaker [23]) are enthusiastically embraced by lobbyists and some policy makers (see, for example, Smith [24]; Centre for Science in the Public Interest [25]). The assumptions that these groups make with regard to a demonstration of cause and effect are then used to support various 'reforms', with the danger that considerable resources may be deployed in facile activity.

A further concern in an increasingly divisive debate is the lack of rigour in reporting research findings, ranging from simplistic summaries, through extremely selective use of research, to sensationalizing, if not distorting results to support claims. This latter activity does a total disservice to the entire debate about the obesity conundrum and

potential solutions. The worst excesses in this regard are such that reports can no longer be considered 'popularist', but rather 'junk science'. The claims that fast food is addictive (Physicians for Responsible Medicine [26]) is an example of this, in that the authors of the studies that are used to 'support' the claim point out that their studies made no such assertion (Yeoman [27]).

Television Viewing: Cause or Effect?

French, Story and Jeffrey, p. 309 [14]) assert, "It is an accepted fact that the changes in eating and exercise behaviours that are driving the obesity epidemic are largely due to an environment that encourages the former and discourages the latter". Television viewing is seen as a 'pathogen' in this regard with numerous writers indicating that there is a link between the amount of television viewing and obesity prevalence (see, for example, Campbell et al. [28]). Zuppa, Morton and Mehta, p.78 [29]) suggest that the amount of advertising to which children are exposed "has the potential to influence children's health attitudes and behaviours". They then cite an Australian National Health and Medical Research Council report which suggests that "television may be more influential than families in setting children's food preferences", yet they fail to acknowledge (other than in their reference list) that this report was released in 1981 in a very different media environment. Dietz and Gortmaker [16] suggest that obesity links to hours of television viewed in the 1980s, with obesity prevalence increasing by approximately 2% for each additional hour of television watched. Although they suggest that there is a correlation between viewing and between-meal-snacking, they acknowledge that their data does not imply causation and that other unmeasured variables may be involved.

Epstein et al. [30] clarify the link by identifying a correlation, but not causation, between television viewing and obesity. They note that sedentary activities such as television viewing can be substituted for active behaviour such as physical exercise. They further observe that obese children, if given equal access to sedentary or physical activities, will choose sedentary options. Television in children's bedrooms increases the children's viewing by 38 minutes per day (Ebbeling Pawlak and Ludwig [6]). The role that such viewing may have within holistic lifestyle activities is unclear although Dietz and Gortmaker, p. 811 [16]) acknowledge, "television viewing only accounts for a small proportion of the variance of childhood obesity."

Samuelson [31] notes the increase in video (rather than television) watching and in computer related activities; especially computer games but makes no comment regarding the impact on physical activity levels. Lord [32] reports that American children are far less involved in physical activities and spend considerably more time sitting before a TV screen / watching videos (the classic 'couch potato' syndrome) or in front of a computer screen ('mouse potatoes'). This increase in sedentary rather than active pursuits, regardless of what specific electronic device they are using, should be noted. Cassidy [33] reports that American children aged 2 – 18 years spend almost 5 and a half hours per day (some 38 hours per week) watching television, playing videogames, surfing the Internet or listening to music (see also, Dietz and Gortmaker [16]).

Television viewing among children aged 5 – 14 years appears to be static, rather than increasing as some critics allege (e.g. Dietz et al. [34]). Children's use of free-to-air

(commercial) channels has actually declined over the last decade, with subscription-based channels (Sky, with more than 30 channels) increasing. The following table shows the average hours and minutes per day of all New Zealand television channels viewing for the period 1992 – 2002. It should be noted that the number of minutes of advertising available per hour has not changed in the last decade. The figures in Table 1 suggest that demonising television, as an implied cause of unhealthy lifestyles, may be erroneous.

Table 1: Hours and minutes per day of television viewing, children aged 5 – 14 years in New Zealand (Source: Nielsen Media Research [35]. Only major Sky channels are shown separately – all others amalgamated under 'Sky Network')

Year	TV ONE	TV2	TV3	TV4	Prime	Sky Movies	Sky Sport 1	Sky Sport 2	Sky 1	Sky Network	Horizon Pacific	MTV	All TV	Potential	Sample
1991	0:24	1:33	0:25	-	-	0:00	0:00	-	-	0:01	-	-	2:23	512,000	183
1992	0:24	1:17	0:24	-	-	0:01	0:00	-	-	0:01	-	-	2:06	512,000	178
1993	0:22	1:19	0:25	-	-	0:01	0:01	-	-	0:02	-	-	2:08	512,000	195
1994	0:23	1:24	0:23	-	-	0:01	0:00	-	0:00	0:02	-	-	2:12	508,000	195
1995	0:22	1:19	0:23	-	-	0:03	0:01	-	0:01	0:05	0:00	-	2:11	516,000	183
1996	0:19	1:13	0:33	-	-	0:04	0:01	-	0:01	0:06	0:00	-	2:13	524,000	179
1997	0:17	1:12	0:36	0:04	-	0:02	0:01	-	0:02	0:06	0:00	0:01	2:16	531,000	194
1998	0:17	1:05	0:32	0:05	0:00	0:05	0:02	-	0:03	0:11	0:00	0:01	2:11	561,000	195
1999	0:16	1:08	0:26	0:02	0:00	0:05	0:03	-	0:04	0:13	-	-	2:07	561,000	179
2000	0:20	1:01	0:33	0:03	0:01	0:03	0:02	0:00	0:03	0:09	-	-	2:08	569,000	182
2001	0:15	1:01	0:31	0:04	0:01	0:04	0:03	0:00	0:04	0:18	-	-	2:11	617,000	197
2002	0:15	0:58	0:31	0:03	0:02	0:02	0:03	0:00	0:02	0:17	-	-	2:05	610,000	202
2003 ytd	0:12	0:56	0:31	0:02	0:02	0:02	0:02	0:00	0:02	0:18	-	-	2:01	610,000	195

2003 ytd : Date period is from 1 January to 02 August

"-" Represents a zero

Note 1: The figures in Table 1 do not include time spent at other sedentary electronic pastimes such as computer and electronic games usage.

Note 2: These are average figures and we might expect variations of high / low no viewing amongst demographic subgroups such as socio-economic status, age (young children versus older children), family circumstances etc (this type of breakdown is not available within the current database). However, average figures indicate that there is no increase in viewing; therefore, we can surmise that there are unlikely to be any major increases in viewing habits among the subgroups themselves.

Table 2 shows that almost half of the total viewing detailed in Table 1 actually occurs in prime time where (hopefully) children are watching with older family members who may model, or give advice on, healthy eating practices. The data in Table 2 also illustrates the erroneous beliefs of lobbyists and policymakers (e.g. Toomath, cited in Smith [24]; Kedgley [36]) that children watch considerable hours of programmes aimed specifically at them, such as Saturday mornings or after school times. The data in both Table 1 and 2 suggests that, of the approximately 2 hours per day of television viewed; only slightly over one hour is spent watching non-peak time programmes.

Table 2: Average Time Spent Viewing by 5 – 14 year olds Per Day, Peak time (6pm – 10.30pm) in Hours and Minutes in New Zealand (Source: Nielsen Media Research [35])

Year	TV ONE	TV2	TV3	TV4	Prime	Sky Movies	Sky Sport 1	Sky Sport 2	Sky 1	Sky Network	Horizon Pacific	MTV	All TV	Potential	Sample
1991	0:15	0:42	0:11	-	-	0:00	0:00	0:00	-	0:00	-	-	1:08	512,000	183
1992	0:14	0:33	0:11	-	-	0:00	0:00	-	-	0:00	-	-	0:59	512,000	178
1993	0:14	0:38	0:11	-	-	0:01	0:00	-	-	0:01	-	-	1:03	512,000	195
1994	0:14	0:38	0:11	-	-	0:00	0:00	-	0:00	0:00	-	-	1:04	508,000	195
1995	0:12	0:38	0:11	-	-	0:02	0:00	0:00	0:00	0:02	0:00	-	1:03	516,000	183
1996	0:11	0:33	0:14	-	-	0:02	0:00	-	0:00	0:02	0:00	-	1:02	524,000	179
1997	0:11	0:31	0:17	0:02	-	0:01	0:00	-	0:00	0:02	0:00	0:00	1:03	531,000	194
1998	0:11	0:32	0:14	0:03	0:00	0:02	0:01	-	0:00	0:03	-	0:00	1:03	561,000	195
1999	0:11	0:32	0:11	0:01	0:00	0:02	0:01	-	0:00	0:04	-	-	0:59	561,000	179
2000	0:12	0:29	0:12	0:02	0:00	0:01	0:01	0:00	0:00	0:03	-	-	0:59	569,000	182
2001	0:09	0:28	0:12	0:02	0:00	0:01	0:02	0:00	0:01	0:06	-	-	0:58	617,000	197
2002	0:09	0:26	0:13	0:02	0:01	0:01	0:02	0:00	0:01	0:05	-	-	0:57	610,000	202
2003 ytd	0:08	0:24	0:15	0:01	0:01	0:01	0:01	0:00	0:01	0:05	-	-	0:55	610,000	195

2003 ytd : Date period is from 1 January to 02 August

"-" Represents a zero

There have also been numerous claims since the 1970s (see, for example, Goldberg, Gorn and Gibson [37]; French, Story and Jeffrey [14]) that television viewing may result in increased food intake, both by prompting eating behaviours through exposure to multiple food advertisements and as a conditioned stimulus**,** particularly if people repeatedly eat in front of their television sets. Classical conditioning theory (Hawkins, Best and Coney [38]) states that using an established relationship between a stimulus and a response can bring about the learning of the same response to a different stimulus, thus eating meals or snacks in front of the television will result in television viewing becoming associated with eating. Further, it is suggested that exposure to television advertising may not only encourage snacking but also influence viewers' food choices towards higher-fat or higher-energy food although these authors acknowledge that "few data are available to address these hypotheses"(French, Story and Jeffrey, p. 316 [14]).

Ignored in this debate are studies that indicate that the claimed link between physical activity and 'fatness', usually measured by the Body Mass Index (BMI) is not as clear-cut as proponents portray. For example, Anderson et al. [39] found a relationship between the amount of television viewing and body fat, but also found that boys who reported the highest levels of physical activity also had the highest BMI scores. Lowry et al. [40] found that, among black high school children, TV viewing was associated with *greater* participation in physical activity. The cultural dimensions of the assumed linkages between media useage, physical activity and overall health do not appear to have been systematically explored in the literature, yet, as Lowry et al. [40] caution, cultural factors must be considered when developing appropriate interventions.

What is the Role of Advertising in Promoting Food Choices?

Some critics claim that advertising manipulates consumer preferences, thereby reinforcing the biological pressures driving obesity (Anon. [41]). This type of claim is a not uncommon example of how some writers misrepresent scientific knowledge and play to audiences who may be encouraged to mistrust business motives – particularly in the light of continued exposure to sensationalized pseudo-science. The assertion noted above, of course assumes that people are easily manipulated and that advertising acts as a strongly persuasive force.

The same anonymous authors who make the above assertion (Anon. [41]) specifically blame high profile fast food brands for manipulation of consumer perceptions. They further claim that advertisers can market good taste of foods as the primary reason for purchase, while "misleading consumers about the health risks that their products pose" (Anon, p.1170 [41]). A point often lost in all the criticism is one that McDonald's itself often points out – is that the experience of McDonald's is often positive (Jeory [42]). To assert, without offering specific evidence, that food advertisers such as McDonald's deliberately mislead consumers about the health risks of their products is a disservice, if not a distortion of an important debate, especially given that the anonymous article cited above appeared in the *Harvard Law Review*.

Recent (unsuccessful) attempts in America to sue companies such as McDonald's for failing to warn consumers of health dangers claimed to be associated with consuming their food are now being acclaimed as being the drivers for the provision of better nutritional information and a change to healthier menus (Weekend Herald [43]). These claims are incorrect. Buchholz, p 21 [44] provides the following extract from the decision in a recent obesity lawsuit (Pelman v. McDonald's Corporation, 2003):

> *"The dangers of over-consumption of.... high-in-fat foods, such as butter, are well known. Thus, any liability based on over-consumption is doomed if the consequences of such over-consumption are common knowledge... Thus in order to state a claim, the Complaint must allege that either the attributes of McDonald's products are so extraordinarily unhealthy that they are outside the reasonable contemplation of the consuming public or that the products are so extraordinarily unhealthy as to be dangerous in their intended use. The Complaint – which merely alleges that the foods contain high levels of cholesterol, fat, salt and sugar, and that the foods are therefore unhealthy – fails to reach this bar"*

Buchholz [44] also notes that McDonald's readily provide information on the nutritional content of its foods - a point he observes was also made by the judge in the above case.

Advertising Bans and Sales / Excise Taxes

In spite of a growing body of evidence that banning advertising of foods perceived to be of low nutrient value and / or foods targeted at children would be both inequitable and ineffective (see, for example, Eagle, de Bruin and Bulmer [45]; Young [46]), there remain lobbyists who maintain that such bans "are central to any serious strategy to reduce the incidence of advertising-related chronic diseases such as obesity, diabetes and cardiovascular diseases" (Commercial Alert, p. 2 [47]).

This approach is typical of those who perceive that there is a direct link between advertising food products and weight gain (see, for example McLellan [48]). More seriously, the World Health Organization position appears to continue to support such a move, while acknowledging the complex causes of obesity (WHO [49]). As already noted, many critics fail to distinguish between correlation and causation, see for example Ludwig, Peterson and Gortmaker [23]; yet lobbyists and some policy makers enthusiastically embrace such assumed relationships (Jones, Williams and Buckley [50]).

In parallel with calls for advertising bans are calls for the imposition of some sort of 'sin tax' on foods deemed to be unhealthy (Ahmad [5]). The WHO's position is that, having taken expert advice, including from the World Bank, they are unlikely to recommend taxation as a solution to growing obesity rates as it would create distortions in the food market and also possibly undesirable unintended effects (Jones, Williams and Buckley [50)]. However, this has not stopped some supporters of bans continuing to push for this option (see, for example, Toomath, cited in Smith [24]). The World Federation of Advertisers, p.3 [51] adds to the warnings of unintended consequences if taxes were introduced, asserting "imposing a tax on certain types of food or food advertising would be equivalent to dictating consumer diets, by judging for them what they should and should not be eating". For an in-depth discussion of the theoretical implications of an advertising tax, see Allen, Eagle and Rose [52].

Psychological Reactance Theory

Attempting to force change through social engineering is, at best, problematic. One of the many claims made in support of legislation, such as advertising restrictions or outright bans, aimed at forcing change is that education will not work (Toomath, cited in Redwood [53]). The theory of psychological reactance (Rummel et al. [54]) states that people become motivated to assert their freedom by performing behaviour when it appears that their freedom might be threatened or restricted. Thus, parental disapproval of particular television shows or foodstuffs can be interpreted by children as threatening their freedom of choice – and may motivate them to consume more of the product disapproved of – precisely because of the disapproval. Psychological reactance theory has particular relevance in the context of proposed bans. Any attempt to regulate diets is likely to be seen "as a paternalistic infringement on their autonomy" (Anon, p.116 [41]).

Mills [55] posits that children (and perhaps adults) like unhealthy food *because* it is unhealthy or that they note some form of parental disapproval with regard to its consumption, perhaps linking to the 'forbidden fruit' hypothesis (Cantor and Nathanson [56]). It is possible, therefore, that attempted restrictions may actually encourage consumption rather than successfully limit it. Common strategies such as rewarding children with sweets or biscuits for performing desired behaviours has been shown in several studies across the last twenty years to significantly increase preferences for the 'reward' foods; conversely, where activities (such as watching television) are used contingent on eating particular foods (such as vegetables), preferences for those foods decline substantially (Birch [57]). Fisher and Birch [58] caution that restricting access to specific foods in an endeavour to encourage moderate consumption of those foods actually resulted in increased consumption once children were given free access to them. Thus, enthusiasm for making television-

viewing contingent on physical activity (Faith et al. [59]) could have the reverse effect to the intended voluntary increase in physical activity in the long term.

These experiences should be borne in mind when considering the objectives, versus the probable realities of any form of forced physical education in the hopes of instilling lifelong habits of regular exercise, or other interventions where noble objectives might be coupled with unintended reverse outcomes. As will be shown in later sections, this theory has considerable relevance in developing any public health intervention programmes.

Dieting / Weight Loss

High numbers of people diet, whether they needed to or not. Kassirer and Angell [8] provide a very broad estimate of between 15% and 35% of the population may be dieting at any one time, and suggest that the percentage figure among adolescent girls is substantially higher. Bacon et al., p.855 [60]) highlight the increase in dieting over time, citing a steady 14% of women actively dieting at any one time between 1950 – 1966; this rose to 26% in 1988 and 44% in 1996. Dieting, while the most common means of attempted weight reduction, is not the only method used. A range of means is employed from dieting, to exercise, herbal and 'alternative' remedies through to medications that are more conventional. Levitsky [61] notes an increase in 'pharmacological agents' / diet drugs with the emphasis moving from appetite suppressants to direct weight reduction (see also, Klem et al [62]; Kelner & Helmuth [63]; Cogan & Ernsberger [20]; Berg [64]; McFarlane, Polivy and McCabe [65]; Anand and Basiotis [66]; University of Pittsburgh Medical Centre [67]; Prentice and Jebb [68]; Clarke [69]; World Federation of Advertisers [51]).

A considerable amount of this effort may be in vain. For many people, permanent weight loss is difficult, perhaps impossible (Jonas [9]). Cogan & Ernsberger [20] warn that there is a considerable body of research indicating that weight loss programmes do not have long-term positive results for the majority of people. This view is supported by numerous longitudinal studies, such as Jeffrey et al. [70] who review twenty years of weight control research, noting short-term efficacy but not long-term success.

Food Technology and Cultural Changes

One of the many factors driving changes in food consumption patterns is the gradual shift in mindset from 'eating to live' to 'living to eat'. Food has taken on greater importance in modern lives as a pleasure and a recreational activity in itself. Over 40 years ago Levy, p. 119 [71] suggested, "It is increasingly fashionable to be a connoisseur or gourmet of some kind". The questions faced in the consumption of foods (and other goods and services) have changed from "do I need this?' to "do I like this?" (Levy [71]) Complex cultural changes in attitudes towards eating and the role of food in everyday life are themselves driven by a multiplicity of factors.

Affluent Western consumers have also become used to the increased availability of foods due to advances in food science and manufacturing. Improved storage technologies have lead to reasonably priced fruit and vegetables being available throughout extended periods of the year. Instead of being restricted in food options according to season, consumers are faced with a huge array of products everyday of

the year. Furthermore, foods that once were treats have become mainstream, every day foods. Breads, cakes and biscuits do not go stale within hours of baking; instant milkshakes can be bought as sweetened flavored milks from chill cabinets or in long-life forms; pasta and noodle meals can be prepared at work in a minute; crispy fried snack foods such as potato chips and pork crackling can be kept without going soft or rancid; frozen roast dinners, single serve pizzas and gourmet pies can be eaten within minutes using microwave technology. It is certainly quicker and easier than ever before to satisfy a gourmet appetite.

However, changes in technology have meant that we have made some kind of Faustian bargain. Historically, most food preservation was based on drying and the use of salt and sugar e.g. cured hams, salami, salted fish, olives, jams and fruit preserved in syrup. In moving away from the traditional technologies and the high levels of sugar and salt in part of our diet, we now potentially consume more starchy and fatty foods. In a world of choice and variety, consumers have the option to turn to sugary, salty and fatty foods out of preference. Today's consumers eat so many foods that were not available to their grandparents.

Is It Really a 'Weighty Problem'?

A somewhat simplistic commentary on what is actually a complex issue is provided by Jackowski, p. 60 [10] who contends, "a great exercise program can make up for a poor diet, but a great diet can never make up for lack of exercise". Fraser, p.7 [72] illustrates that there is not a simple relationship between weight and health risk by reporting an empirical study that found that when physical fitness was factored in "thinner men who were out of shape were nearly three times more likely to die young than the fat men who exercised regularly". His view is supported by Gaesser, p. 8 [7] who asserts, "Many of the cardiovascular and metabolic problems associated with obesity can be resolved independently of weight loss". Cogan and Ernsberger [20] note a preoccupation with weight loss; these views are echoed by Miller, p.207 [73] who cautions against measuring the effectiveness of any interventions against "medically ambiguous variables like body weight or body composition".

The Body Mass Index (BMI), although widely used, is less precise as an indicator than many of its users would suggest. It is an index number, originally devised in the nineteenth century (Bagust and Walley [74]) that shows body weight adjusted for height. It is calculated by dividing an individual's weight (in kilograms) by the square of their height (in metres). It is used for adults aged 20 years or older, and provides the following categories: underweight (BMI less than 18.5), BMI normal (between 18.5 and 25), overweight (BMI exceeds 25), or obese (BMI exceeds 30). Note: BMI for children and teens is based on gender and age specific charts (National Center for Chronic Disease Prevention and Health Promotion [75]; Friedman [76]). The NZ Ministry of Health [77] give several definitions adjusted for ethnicity: 32 for Maori and Pacific peoples are considered overweight. A BMI greater than 30 for NZ European and Other and a BMI greater than 32 for Maori and Pacific peoples is considered obese (see also Hoby [78]; Obesity, Fitness & Wellness Week [79]; Kassirer and Angell [8]). Moreover, the BMI indicators appear to have changed over time (see, for example, Berman [80]; Berndt [81]). Robinson [82] supports the move away from a predominant focus on weight and advocates the holistic view of health espoused by a growing "Health at Every Size" (HAES) approach. He provides the following comparison (Table 3).

Table 3: Comparison of Traditional Weight Loss Paradigm and Health at Every Size Paradigm

Traditional Weight Loss Paradigm	Health At Every Size
Everyone needs to be thin for good health and happiness	Thin is not intrinsically healthy and beautiful, nor is fat intrinsically unhealthy and unappealing
People who are not thin are 'overweight 'because they have no willpower, eat to much, and don't move enough	People naturally have different body shapes and sizes and different preferences for physical activity
Everyone can be thin, happy, and healthy by dieting	Dieting usually leads to weight gain, decreased self-esteem, and increased risk for disordered eating. Health and happiness involve a dynamic interaction among mental, social, spiritual, and physical considerations

Source: Chart reproduced from Healthy Weight Journal, January / February 2003, Robinson, p4 [82]

Food Pyramid

Further confusion may be due to the nature of information provided regarding what foods should be eaten in what quantity. People may in fact be misinformed about what constitutes a healthy diet. This issue is multi-faceted, and whilst the public have seemingly poor basic knowledge of how to eat well, controversy surrounds the nutritional messages being promoted to the public, particularly in regards to the Food Guide Pyramid (U.S. Department of Agriculture [83]).

The pyramid, which critics are now claiming is imperfect (Willet and Stampfer [84]; Hall [85]; Harvard Women's Health Watch [86]; Mayers [87]), lacks guidance on the specifics of each food group, when certain foods should be eaten, what other foods they should be served with and the recommended portion sizes. Willet and Stampfer [84] imply that the Food Guide Pyramid released in 1992 by the U.S Department of Agriculture (USDA), aimed at helping the American public make wise dietary choices, is in fact grossly flawed. They support this with the fact that the traditional pyramid is based on a high consumption (six-eleven servings per day) of complex carbohydrates – bread, cereal, pasta, and rice – and that scientists had found little evidence to show that a high intake of carbohydrates is beneficial. Therefore, by promoting the consumption of all complex carbohydrates and encouraging people to abstain from fats and oils the pyramid is misguiding (Willet and Stampfer [84]). However, it should be remembered that authorities have always advocated variety and balance in the diet, trying to encourage consumption of varied foods within the levels of the pyramid in order to ensure better nutrition.

Exercise

The link between physical exercise and weight change is unclear. Fortier, Katzmarzyk and Bouchard [88] review several studies and note confusion and sometimes-conflicting results, including that, in a large scale, longitudinal Canadian study, neither physical activity / aerobic fitness levels nor changes in these across the study period were predictors of changes in body mass. This perhaps illustrates the complexity of the factors underlying obesity. However, the under- recognised role of aerobic fitness (as opposed to weight reduction) as a result of exercise is well documented in longitudinal studies (see, for example, Johnson et al. [89]). Another, unexpected, benefit from aerobic fitness is that it also reduces brain tissue loss as people age! (Colcombe et al. [90]).

Conversely, while there is an increase in interest in exercise programmes, there is also a considerable body of literature documenting the tendency for many people to drop out of exercise programs. The reasons for this are undoubtedly myriad. Among the principal reasons given are highly rational ones such as lack of time and pressure of work. Kelly and Harrison [91] identify the latent motives that include the fact that their expectations from the exercise programme, such as rapid or steady weight loss were not being met. This may be due to the expectations having been unrealistic in the first place. They identify a further reason than should be of concern in developing a range of potential interventions: many people simply find exercise boring! Kilpatrick, Bartholomew and Riemer [92] caution that goal orientation in exercise may affect substantially on exercise behaviour. They caution, however, that further work is needed into factors such as exercise enjoyment (see also Hovell et al. [93]; Samuelson [31]; Wilcox et al. [94]; Gerrard [95]; Fleck [96]; Pi-Sunyer [97]; Young [46])

Whilst the benefit of planned exercise is well accepted, there are real problems in actually gaining sustained commitment to long-term regular exercise. The challenge for policy makers is to show how easily a variety of exercise options can be incorporated into existing daily lives with the minimum of equipment and cost. In addition, policy makers and planners must consider longer-term urban design factors such as the provision of safe walkways, cycle ways and park areas.

Family Environment

Southern and Gordon [98] observe that food preferences and the social context within which children associate foods (i.e. which foods are eaten at which times / occasions) are well established by the time children begin kindergarten. O'Dea [99] provides an interesting insight in that, while children understand the benefits of healthy eating, and readily acknowledge negative effects of 'junk food', they perceive many health foods as poor in taste, appearance and smell. This may indicate some post-rationalization on the part of O'Dea's study participants, but, more importantly, it also indicates yet another barrier to be overcome in terms of changing attitudes and behaviours.

Huon et al., p. 156 [100]) provide an analysis of both Australian and American children's diets, finding that:

"Some 14 to 18% of all (Australian) children did not consume any vegetables on the day of the study. Furthermore, only 56.1% of 12-year old boys and 65.5 % of 11-year-old girls consumed any fruits". ... In the US the current daily fruit and vegetable intake among children is typically half of that which is thought to be desirable for good health."

Moreover, Sullivan and Birch [101] highlight the importance of the family environment in shaping food preferences and stress that experience with a food drives preference in children (see also Campbell et al. [28]; Southern and Gordon [98]; Dietz and Gortmaker [102]; Ebbeling, Pawlak and Ludwig [6]; Samuelson [31]). Southern & Gordon [98] note that parental inactivity strongly predicts child inactivity; similarly, parental exercise patterns strongly influence their children's patterns. A further factor to be considered in child activity levels is the location of schools relative to housing. Dietz et al. [34] observe that locating new schools at the edge, rather than at the centre, of residential areas may increase the number of students who cannot, or chose not to, walk or ride bikes to school (see Ebbeling, Pawlak and Ludwig [6]; Sobal and Stunkard [103]; Jain et al. [104]

Motivation

At one level, people are aware of potential health problems relating to obesity, the lack of adequate exercise and the need to adopt healthier lifestyles. However, in terms of actual behaviour, attitudes and knowledge do not translate into sustained commitment to lifestyle changes. At one extreme, there is a tendency to post-rationalize behaviour rather than to acknowledge a lack of self-control with regard to diet, or lack of commitment to change diet or activity behaviour (Baumeister [105]). At another extreme, Barlow and Dietz [106] note a range of problems with individuals, including children and adolescents, who are identified as having, or being at high risk of developing, potentially severe health problems but who do not want to control their weight and resist any attempts to do so (see also Brouwers and Sorrentino [107]; Chew [108]; Chew et al. [109]). However, knowledge does not necessarily translate into behavioural change. There is a lack of personal relevance and widespread apathy when long-term health problems and current changes to diet and lifestyle are linked (Ruiter, Abraham and Kok [110]; Menon, Block and Ramanathan [111]; Astrom and Rise [112]).

Jayanti and Burns [113] highlight the difficulties in convincing consumers to change their lifestyles, given that unhealthy habits such as poor eating patterns and lack of exercise are firmly entrenched.

Thus, the challenge for all stakeholders grappling with these issues is to identify ways of providing a mix of education, awareness-raising and motivating factors that will be seen as being personally relevant to a wide range of people AND that can be sustained in the long-term.

Therefore, what can / should be done and by whom?

One small part of the problem is the constant barrage of often-conflicting material in the media. For example, as previously noted, the food pyramid, the Atkins diet, and the BMI have all been criticized. Consumers have every right to feel confused and

skeptical about each successive iteration of 'reports'. If behavioural change is the desired result of any future activity, then a multi-disciplinary approach has to be developed to determining what the significant influences on obesity are. This would involve policy makers, marketers, media, food stores (of all types), health and fitness industries, communities, and even schools.

The media have a responsibility to ensure that their discussion of health–related issues are not, as it is often suggested, misleading and misinforming their customers (Giles [114]). The value of the media is in "their ability to influence what the public thinks about as opposed to what to think" (Wilde, p. 990 [22]). Marketers have the responsibility to ensure that all marketing activity meets the highest ethical standards in terms of disclosure of nutritional information. In addition, given that marketing activities are the focus of much of the 'demonizing' of fast food marketers in particular, they must also be seen to be responding to legitimate concerns and cooperate with policy makers in developing strategies for communicating with all stakeholders.

Interventions: Public Health / Public Service Campaigns

The need for interventions is not in dispute. The nature of interventions likely to be effective requires careful examination (Patterson, Kristal and White [115]). Proponents of regulation rather than education claim, "Only a small group of the population would be affected by education. Lack of even the most basic nutritional knowledge means a number of parents are, in effect, incompetent and beyond education" (Toomath, cited in Redwood, p. 16 [53]). Buchholz [44] provides an interesting counter-perspective, asserting that:

> *"In fact college educated, not poorly educated people account for the most rapid growth in BMI scores between the 1970s and the 1990s – though poorly educated people still have a higher overall incidence of obesity".*

As we have already stressed, the link between knowledge, attitudes and manifest behaviour is often weak (see Wilde [22]). Bagozzi and Moore, p. 68 [116]) review theories of how public service advertisements are perceived by individuals, particularly the relative effectiveness of emotional advertising appeals. They warn that appeals that "create strong negative emotions such as fear, anger and distress. These feelings can become more intense as the ad is repeated, thus leading to early wear-out and possible negative attitudes towards the ad".

LaTour, Snipes and Bliss [117] suggest that high-anxiety messages are more effective than messages producing low levels of anxiety in health promotion activity. The relative merits of positive and negative framing in media communication should also be considered (Eagle, de Bruin and Bulmer [45]). Wilde, p.986 [22] also provides a useful summary checklist of marketing communication factors that could be considered in a media campaign:

<u>Source factors:</u>

- Source credibility, expertise and trustworthiness.
- Perceived similarity in characteristics, needs and goals between source and receiver.

Message content:

- Psychological distance between the source and recipient (finding common views / agreement on issues).
- Latitude of acceptability (how much change is advocated).
- Agreement or otherwise with the message.
- Primary effects (arguments for an issue are more effective when presented before any counter-arguments are dealt with).
- Paternalistic / lecturing approaches should be avoided.
- Concrete / specific actions should be advocated rather than general slogans.
- Targeted behaviour should be modeled (social learning theory).
- Novel stimuli should be used to catch attention.

Media

- Messages are more likely to be effective close to the time in which the behaviour advocated can actually be undertaken (principle of immediacy)..
- The range of population subgroups should be considered, together with their media usage habits.
- Opinion leaders, particularly those able to model the desired behaviours will be important.

Unintended Effects

Policy makers *and* the marketing/communications industry must take cognizance of past efforts to elicit behavioural change. Ringold [118], for example, reviews a number of studies into the effectiveness of public health interventions and intervention programmes. She notes that some have not achieved the objectives set for them but, more seriously, some have had the opposite effect from that intended. Ringold suggests that psychological reactance theory best explains this 'boomerang effect' which has been found in areas such as increased smoking among teenagers with high knowledge of warning labels on cigarette packets, i.e. the warnings and associated activity are seen as intruding into personal rights and freedom of choice. These boomerang effects have also been found in drug abuse programmes and in alcohol programmes.

Conclusions and Recommendations

Obesity incidence is increasing in many developed countries. It is a serious concern to parents, health professionals and policy makers, particularly in relation to child health and subsequent adult life quality. In the public debate surrounding this topic, the food industry and, more particularly, the marketing activities that they deploy, have attracted attention as the biggest culprit driving the so-called obesity epidemic. Whilst US based multinationals such as McDonald's are vilified, the marketing and communication activities of many other firms in the food industry are placed under the microscope. Although they are easy targets, there is little evidence to suggest that restrictions / bans on food advertising, 'sin taxes' or other punitive measures would significantly impact on the obesity problem. We suggest that many diverse issues in the modern environment occasion the swelling rise of obesity worldwide.

Evidence proving specific causes of obesity is almost non-existent. We can be relatively certain that there is no single cause of obesity and no simple solution.

The question of whether television viewing is a cause or effect, with respect to obesity, is not as clear-cut as critics might suggest. Television viewing is correlated with obesity only to the extent that viewing may replace pastimes that are more active. Sales statistics and other empirical data have demonstrated that most television advertising for foods has an influence only on individual brand preferences rather than total category sales levels. Furthermore, average viewing levels among children are not increasing as claimed and have been static, if not in slight decline, for several years. Parental/family influences on diet and exercise are stronger than many policy makers recognize.

Levels of physical activity required to conduct everyday life have fallen as fewer people walk *anywhere*. Physical activity has also declined since the advent of household labour-saving devices and electronic forms of entertainment. Exercise may now be seen as just another chore or time-consuming commitment for many adults and children. Moreover, while there is recognition that exercise is desirable as part of a healthy lifestyle, the type and amount of exercise that is beneficial is subject to considerable debate.

We propose that a range of factors be considered in designing strategies to combat obesity – or at least to stop its continued increase. Multiple initiatives and incremental steps are needed, with cooperation between parents, educators, public health professionals, sports and recreation organisations and the food industry. Clearly, a total focus on dieting and weight loss is not necessarily helpful. A key driver in personal weight reduction appears to be recognition of both rational and emotional factors that influence behaviour. Marketing communications can be used effectively to ensure that messages aimed at generating long-term behavioural change are seen as having personal relevance to the individuals targeted. Public service messages may be used to good effect with regard to eating and exercise habits.

Longer term initiatives in town planning and environmental design may be part of the solution. Safer walking routes, pedestrian access to 'car only' shopping precincts and other such measures may help reintroduce exercise into daily life.

To summarise, those who seek a revelation or blueprint to a guaranteed, successful solution to the current obesity-related problem, will be disappointed. There is no single, simple solution. The problem is complex, multi-faceted, and poorly understood. What is needed is that all stakeholders work together to develop a range of interventions that will, incrementally, achieve both attitudinal and behavioural change. This needs to be coupled with an integrated research programme that will address the multitude of gaps in knowledge and increase understanding of the impact of a range of factors potentially affecting diet, lifestyle and overall health issues.

As we have noted, the causes of obesity are complex. They are acknowledged in many studies, and the need for more research is evident. The key areas for future research need to be crystallized, most likely from a marketing and a non-marketing perspective.

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