

## Persuading Young Consumers to Make Healthy Nutritional Decisions

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## **ABSTRACT**

There is widespread concern that consumers are making inappropriate decisions about what they eat, leading to a growing incidence of obesity and chronic illness which will strain public health budgets and damage economic competitiveness. Inappropriate nutritional decisions and obesity are of particular public policy importance where young consumers are concerned. The paper investigates how consumers, particularly young consumers, can be persuaded to make better nutritional decisions voluntarily, and how government and commercial persuasive communications can be deployed to facilitate such decisions. The key conclusions are that the mass media are not a reliable vehicle for bringing about the desired behavioural changes, but that new media, such as the Internet and 'text messaging' should be used to deliver tailored messages to individuals, particularly younger consumers.

## **KEYWORDS**

Young consumers; social marketing; health; nutrition; obesity

## Introduction

In recent years the private decisions of individuals about aspects of their lifestyle, particularly concerning nutrition and exercise, have become important issues of public policy in many developed countries. For example, in the United Kingdom the government is actively involved in promoting greater consumption of fruit and vegetables and of fiber, and lower consumption of saturated fat, salt and added sugar, and the US government has undertaken a major initiative (“Healthy People 2010”) aimed at disease prevention and health promotion (UK Department of Health, 2004; US Department of Health and Human Services, 2005). These initiatives are being pursued even though there is, as yet, no evidence that the overall health of either nation is in decline; quite the contrary since according to the US National Center for Health Statistics (2005:3): ‘The health of the Nation continues to improve overall ... Life expectancy in the United States continues to show a long-term upward trend’. However, the National Center for Health Statistics (2005) argues that one of the key reasons for the continued improvement in the Nation’s health is the success of public education campaigns emphasising a healthy lifestyle, so emphasising the importance of continued support for such campaigns. There seems to be a growing political consensus that various forms of state intervention in the free market are justified in order to persuade (or possibly coerce) consumers to make healthy lifestyle choices.

The arguments for government intervention in consumer lifestyle decisions about health, diet and exercise revolve around the issues of obesity, chronic disease and population ageing. A typical example is provided by Asato (2004:7):

‘In the last ten years the number of obese children in the UK has doubled and around 10% of all children are now pronounced “officially obese”. According to a National Audit Office report, more than 31,000 people a year are dying prematurely, equaling 6% of all deaths, as a result of a lifestyle of fatty diets and lack of exercise.’

Consequently, the British government has ‘identified avoidable morbidity and mortality as a major social problem and is committed to a public health strategy to minimize such harm’ (Alaszewski, 2005:101). In the United States the ‘obesity epidemic’ is even more severe, with 31.1% of adults and 15.8% of children aged 6-11 being classified as obese based on data for the period 1999-2002 (National Center for Health Statistics, 2005). There is growing concern that high levels of obesity among the current generation of young people will cause chronic health problems in later life, just at the time when the demands on healthcare systems from ageing Baby Boomers reach their peak. Governments also fear the consequences of an ever more unhealthy population for public healthcare spending, taxes, and votes. The UK government has addressed these issues through a series of policy review and studies, most notably the Wanless Report of 2002, a Department of Health White Paper of 2004, and an independent study conducted by the National Social Marketing Centre and published in 2006 (National Social Marketing Centre, 2006; UK Department of Health, 2004; Wanless, 2002).

The concern manifested in these documents is that many consumers are poorly informed about nutritional and exercise choices, and the assumption is that if they were better informed they would be more likely to make consumption decisions that would promote their own long-term interests. However, our knowledge of what consumers know about nutrition, exercise and health is limited, and we know little about what media or what messages may influence consumer attitudes, and ultimately behaviour towards these matters. Young

consumers are a matter of particular concern; among the many stories in the mass media about the long-term health damage likely to result from poor nutrition and obesity, it is stories of childhood obesity and predictions that the life expectancy of the present generation of young people will be lower than their parents that feature most prominently (a characteristic example was the television documentary with the self-explanatory title ‘Too Fat to Toddle’, aired on the British ITV1 channel on 6<sup>th</sup> May 2008). A UK National Audit Office Report assessed the substantial economic and social damage that would arise if obesity among children and young people was not brought under control, and encouraged the UK government to set targets for the reduction of obesity rates (National Audit Office, 2006).

Media coverage can affect health-related behaviours, particularly when specific themes are repeated and when behaviour has a strong normative component (Petts & Niemeyer, 2004). For example, the use of hormone replacement therapy (HRT) declined sharply after media reports of adverse findings in a large scale HRT trial (Schwartz & Woloshin, 2004b). Media coverage of new medications and medical research has been criticised for its promotional nature, its sensationalism and the lack of critical, balanced journalism (Cassels, et al., 2003; Caulfield, 2004; Moynihan, et al., 2000; Moynihan & Sweet, 2000). Concerns have also been expressed about the way that medical research findings are reported, in particular that benefits are over-sold and risks under-stated, benefit claims confuse absolute and relative effects, and that the results of preliminary studies (such as animal studies) are given too much credence. There is evidence that patients may respond to such stories by ceasing to take an important medication or by requesting ‘new’ treatments not yet proven in human trials (Cassels, et al., 2003; Schwartz & Woloshin, 2004b; Shuchman, 2002). It has, therefore, been suggested that preliminary findings should not be reported in mass media (Schwartz & Woloshin, 2004a).

The central focus of our study is on how an understanding of consumer behaviour can assist governments and other agencies, including commercial food marketers who increasingly perceive healthy products to be a key growth market, to persuade private consumers – particularly young consumers - to make more healthy-eating choices in their day-to-day consumption choices. In the following section we present our conceptual framework in greater detail, based on the Fishbein & Cappella (2006) integrative model of behaviour change. We then move on to describe the empirical research that was undertaken among young consumers to investigate knowledge and sources of information about diet, exercise, obesity and health. Following the discussion of the results of this empirical research, we identify the key messages for policy-makers and important areas for future research that have emerged from this study.

## **Bringing about health-related behaviour change**

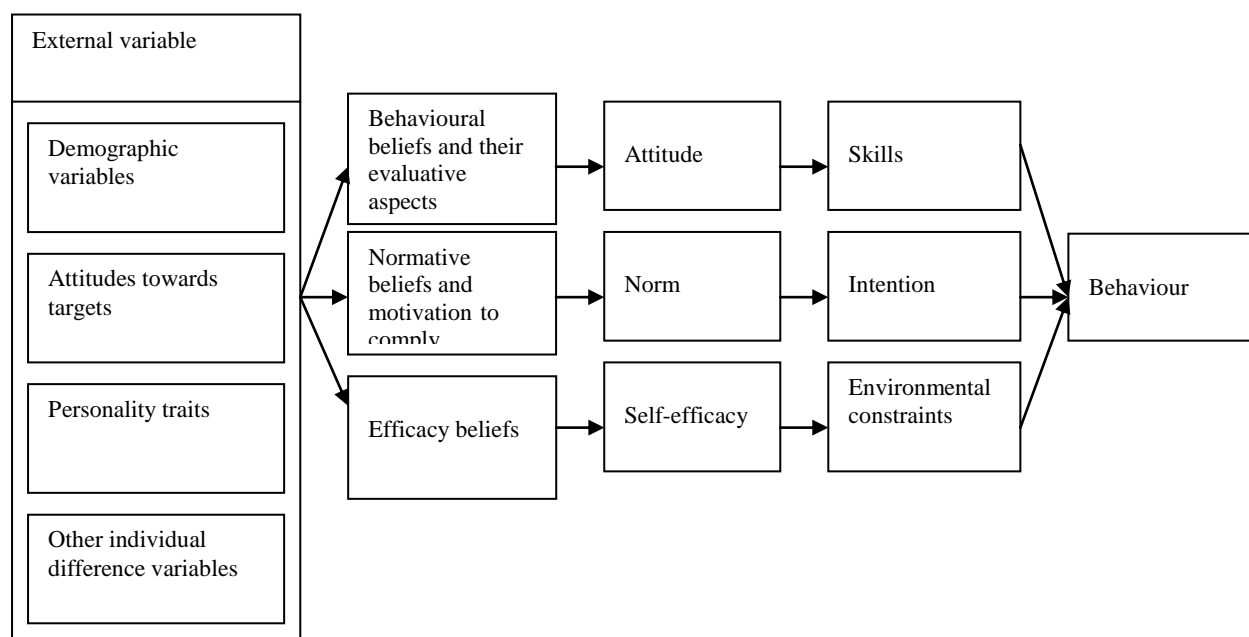
This section is largely concerned with providing the intellectual framework upon which a health-related behavioural change programme can be built. This framework is based on the attitude-intention-behaviour models associated with the Theory of Planned Behaviour (Ajzen, 1991), as applied in numerous health-related projects that we discuss below. However, before exploring this body of knowledge, it is worth examining an implicit assumption in much of the literature on health-related behavioural change, namely, that changing peoples' behaviour in order to improve their health prospects is necessarily a good thing. To the contrary, Görman (2006:15) has argued that 'focus on the quest for health may sometimes be a health problem in itself.' The terms 'healthism' and 'medicalisation' have been used to describe

social processes by which the quest for good health becomes an obsession, and experiences that were once considered to be a normal part of life are re-classified as medical conditions requiring treatment (Conrad, 1992; Crawford, 1980; Illich, 1975). A similarly sceptical point of view was championed by Skrabanek (1994), who wrote that: 'The pursuit of health is a symptom of unhealth. When this pursuit is no longer a personal yearning but part of state ideology, *healthism* for short, it becomes a symptom of political sickness.' (Skrabanek, 1994:15). Such views offer an interesting contrast to the clear assumption in reports for both the UK and US governments that states should employ a wide range of measures to persuade citizens to improve their health (UK Department of Health, 2004; US Department of Health and Human Services, 2005).

Theories of attitudes and behaviour have provided the basis for successful behaviour-change programs in a number of health-related fields (Alcalay & Bell, 2000; Brinol & Petty, 2006). Examples relevant to the present study include smoking cessation (Fishbein & Cappella, 2006), safety-belt use (Brittle & Cosgrove, 2006), HIV prevention (Fishbein, 2001), improvement of physical activity (Gardner & Hausenblas, 2004), and nutrition and other health behaviours (Ory, Jordan, & Bazzare, 2002). Attitude-intention-behaviour theories identify both the determinants of health behaviour and the beliefs underlying those determinants (Fishbein, 2001; Fishbein & Cappella, 2006). Consequently, they focus policy makers' attention on issues which are critical in devising and evaluating public health interventions (National Cancer Institute, 2005), and they 'guide researchers to routes to persuasion and to beliefs to target in persuasive efforts' (Cappella, 2006:268). Given their acknowledged value, research on health behaviour has utilised numerous theoretical models at a variety of levels, including the individual, interpersonal and community levels.

Specific behavioural models designed for particular applications have proliferated (Noar & Zimmerman, 2005). These models have had varying degrees of success in predicting behaviour in health-related settings (Fitzmaurice, 2005; Gardner & Hausenblas, 2004). Even work grounded on a theoretical or empirical comparison of various health models falls short of demonstrating the superiority of one model over another (Alcalay & Bell, 2000). In addressing this issue, Noar and Zimmerman (2005) have argued that the best way the field can move forward is through theoretical integration, where constructs from different theories are integrated to form a new theory. An example of such theoretical integration is Fishbein's (2000) model which draws on some of the most respected theoretical work on attitudes in social psychology, including the theory of reasoned action, the theory of planned behaviour, the health belief model and social cognitive theory (Fishbein & Yzer, 2003).

Figure 1: Integrative Model of Behavioural Prediction and Change (Fishbein & Cappella, 2006)





The specific model that provided the theoretical foundation for the present study was Fishbein and Cappella's (2006) integrated theory of behaviour change (see Figure 1). In this model, which is a development of earlier work on the theory of reasoned action (Ajzen & Fishbein, 1980) and the theory of planned behaviour (Ajzen, 1991), 'any given behaviour is most likely to occur if one has a strong intention to perform the behaviour, has the necessary skills and abilities required to perform the behaviour, and there are no environmental or other constraints preventing behavioural performance' (Fishbein & Cappella, 2006:52). The primary determinants of intention are the attitude towards performing the behaviour, perceived norms concerning performance of the behaviour, and self-efficacy with respect to performing the behaviour. Fishbein and Cappella (2006), in a study of adult smokers, showed that this model can be employed effectively in the analysis of persuasive communications directed at bringing about healthy behaviours. In our study we have employed the model to address the pressing issue of how to persuade young consumers to eat a healthier diet.

Support for the model and its constituent elements in predicting health intentions and behaviour is strong both in the developed and the developing world (Cappella, Romantan, & Lerman, 2002; David, Capella, & Fishbein, 2006; Fishbein, 2000, 2001; Fishbein & Yzer, 2003; Weber, Martin, & Corrigan, 2006; Zhao, et al., 2006). In the field of nutrition, in particular, several important elements of the model have been shown to affect individuals' eating choices; Gardner and Hausenblas (2004) demonstrated the importance of intentions, Wansink and Chandon (2006) and Haeran and Delvechhio (2004) the importance of literacy skills (the ability to comprehend healthy eating messages), while French et al (French, Story, & Jeffery, 2001) showed that environmental factors such as the availability of fruit and

vegetables were important. It follows that successful interventions should be based on identifying those determinants of behaviour that need to be changed.

If people have formed strong intentions to perform a behaviour (in this case, to eat a healthier diet) but are not acting on them, then behavioural change can be achieved either through building the required skills or through the elimination of environmental barriers to behavioural performance (Fishbein & Yzer, 2003). If people have not formed the desired intention, the model suggests that an intervention should be directed at changing the antecedents of behavioural intention, that is, the attitude towards performing the behaviour, perceived normative pressure and self-efficacy. The relative importance of these three determinants as predictors of intentions varies with demographic, behavioural, psychosocial and cultural factors (Fishbein, 2000, 2001). For example, some behaviours, such as marijuana use, are primarily determined by individuals' attitudes (Zhao, et al., 2006), others, such as condom use, are predominantly influenced by normative pressure (Fishbein & Yzer, 2003), while some others, including smoking cessation, are influenced by a combination of self-efficacy and peer pressure (Lee, Hubbard, O'Riordan, & Min-Sun, 2006) or a combination of self-efficacy and attitudes (Hsu, Wang, & Wen, 2006). It follows that the first step in developing communications to change intentions is to understand whether a given intention is primarily determined by attitudinal, normative or self-efficacy considerations (Fishbein and Yzer 2003). In all cases, however, individuals' underlying beliefs must be addressed because attitudes, perceived norms and self-efficacy are shaped by beliefs about the consequences of performing a given behaviour as well as evaluations of those consequences (Lee, et al., 2006). Thus, 'a fundamental strategy for behavioural change under the integrative model is to change a well selected belief or set of beliefs using persuasive messages' (Zhao, et al., 2006:188).

Finally, the model recognises that behavioural, normative and evaluative beliefs may be influenced by characteristics of a demographic, personality and attitudinal nature. Even if these variables do not directly predict the performance of a given behaviour (Cappella, et al., 2002), they are reflected in a population's social structure (Fishbein, 2001). As such, they may form useful bases for segmenting audiences for communication purposes. Indeed, matching or tailoring health communication to different aspects of an individual's personal characteristics can enhance motivation to process health information (Rimer & Kreuter, 2006) and increase its persuasive effect for a diverse range of health behaviours (Block & Keller, 1997), including decreasing physical inactivity (Bull, Kreuter, & Darcell, 1999) alcohol consumption (Agostinelli & Grube, 2002) and increasing fruit and vegetable consumption (Brinol & Petty, 2006).

## **Research methods**

The following specific research questions were addressed in this study.

How are messages about health and nutrition covered in the popular media?

How knowledgeable are young consumers about important health and nutritional concepts?

What sources of information do young consumers use to obtain health and nutritional information?

How trustworthy are those sources of information perceived to be?

The first of these research questions was investigated through a longitudinal qualitative analysis of the content of a popular daily newspaper, while the remaining three were investigated using a questionnaire survey. The logic of the research design was, first, to

investigate the general media treatment of health and nutrition issues through the content analysis of popular newspaper stories, and then to investigate the perceptions of health and nutrition issues among young consumers. The empirical data for the project were collected between June 2006 (when the initial pilot of the questionnaire was conducted) and March 2007 (when the final questionnaire was administered). The newspaper content analysis was conducted for a period of three months in the middle of this period. The rationale for this timing was, firstly, that the newspaper analysis would provide a good snapshot of the health-related issues being covered in the media generally at the time when the main empirical study was conducted and, secondly, that the period 2006-2007 coincided with the UK government's first major policy report aimed at incorporating social marketing into the national health-improvement strategy (National Social Marketing Centre, 2006).

### *Newspaper Content Analysis*

Content analysis is a well-established approach to the systematic analysis of media coverage of current affairs (Bryman, 2004; Holsti, 1969), which has been defined as 'a research technique for the objective, systematic and quantitative description of the manifest content of communication' (Berelson, 1952:18). This method has previously been successfully applied to newspaper coverage of health-related subjects, including the coverage of HIV/AIDS issues (Beharrell, 1993) and food scares (Miller & Reilly, 1995).

In order to understand the nature of the information about nutrition and health obtained by consumers from the mass media a content analysis of a mass circulation British daily newspaper (the 'Daily Mail') was conducted over three months. The Daily Mail has a circulation of over 2.3 million copies a day and over five million readers. This newspaper

was selected on the grounds that in addition to having a large, national readership, it has a readership profile that is broadly representative of the UK population – with nearly an equal number of men and women and substantial readership from all social grades (Newspaper Marketing Agency, 2006). National Readership Survey data show that the Daily Mail has an almost unique ability to reach readers across a wide range of demographic and socio-economic categories. From 2006 to 2009 the readership of the Daily Mail showed a stable readership of around five million, of which 49% male and 51% female, with an adult readership including substantial percentages from each social category, with 54% from the C1 and C2 categories (Newspaper Marketing Agency, 2009). Consequently, the Daily Mail can reasonably be regarded as the archetypal medium of ‘Middle England’. In addition, despite the readership being biased towards older people (a characteristic of newspapers in general), the Daily Mail recorded over 300,000 readers aged 15-24 during this period.

In the first stage of the analysis all articles covering health and nutrition topics published between 1<sup>st</sup> September and 30<sup>th</sup> November 2006 were classified into six categories. The categories emerged from the analysis of the data, and there was surprisingly little overlap between them, so that they can be regarded as mutually exclusive. Additionally, and perhaps surprisingly, the newspaper stories were easily allocated to one category or another, with most stories falling clearly into a single category, and those stories which addressed two or more categories having a clear focus within a predominant category, to which the story was then allocated. In all 299 articles were selected for detailed analysis, many coming from the regular Tuesday *Good Health* section of the paper.

Additional, more detailed content analysis was then conducted on the newspaper articles.

This analysis examined the nature of the source information used as the basis for the article,

the type of study (scientific approach) underlying the article, the overall tone of the article (favourable or unfavourable towards the subject matter, supportive or critical of the underlying study), and the funding source for the underlying study. Where no obvious original source was evident, but the basis of the article appeared to rest on interviews with or quotations from members of the research team, these were coded as researcher-originated. If new product or treatment information had no obvious publication source but included statements from a commercial organisation the articles were coded as industry-originated.

Finally, to measure how comprehensible to the average reader the health-related newspaper articles were, we conducted a SMOG (Simple Measure of Gobbledegook) analysis. The SMOG Index, a readability formula, was used to determine the reading level of 20%, randomly selected, of the health-related articles drawn from the *Daily Mail* for the main analysis. The SMOG index was selected because of its proven accuracy, correlation with other readability formulae and subsequent widespread use in the academic literature (Mumford, 1997; Wallace & Lemon, 2004).

The method used for the SMOG calculations followed the methodology in the literature (Aldridge, 2004; Mumford, 1997; Wallace & Lemon, 2004). The originator (McLaughlin, 1969) of the SMOG formula has also provided an internet-based version of the calculator at <http://webpages.charter.net/ghal/SMOG.html>. In order to verify that the internet calculator did, indeed, provide exactly the same results as the manual calculation of SMOG grades, we compared the results of the manual calculation (using McLaughlin's published formula) with those from the internet calculator for a random sample of 20 articles, establishing that both calculation methods gave exactly the same results. We then used the on-line version of the

Daily Mail to capture the full text of articles that had appeared in print and used the on-line SMOG calculator to determine the readability of the selected articles.

### *Questionnaire Survey*

A questionnaire was developed that was designed to test knowledge of nutrition and health and to identify the most suitable communications media for delivering nutrition and health messages to young people. A pilot study was conducted with 54 undergraduate students, following which a number of minor changes were made to the questionnaire. The principal question areas addressed in the final questionnaire were the frequency with which different sources of nutritional information were used, the perceived trustworthiness of those sources of information, respondents' preferred media for receiving health and nutritional information, and a series of questions designed to test knowledge of nutritional matters. The final questionnaire was completed by a total of 191 young people falling into three categories: 28 secondary school pupils, 96 undergraduate students, and 67 postgraduate students. Young people were selected for this study because they represent a critical age cohort in terms of diet, nutrition and the improvement of the nation's health, but are known to be relatively sceptical about mass media communications messages and therefore difficult to persuade to alter their behaviour (Beard, 2003). This is a difficult but very important target group to convince of the healthy eating message. In particular, there is evidence, in a different empirical context (sun protection behaviour), that the transition from school to university is an important time in young people's lives in terms of their responsiveness to health-related messages. Adolescents in general are the group least likely to protect themselves effectively against excessive sun exposure, and university students in particular have the highest unprotected sun exposure levels among adolescent groups (Baranowski, et al., 1997; Stanton,

Janda, Baade, & Anderson, 2004). By analogy, it seems likely that adolescents in general and those of university age in particular, may be particularly sceptical about nutrition-related health messages.

The demographic characteristics of the sample achieved in the main study are shown in Table 1. The sample is well-balanced in terms of male and female respondents. The data concerning respondent age categories is as expected for the population from which the sample was drawn. The undergraduate sample is largely ‘traditional’ students in the age range 19-24, with a minority of mature students, while the postgraduate sample shows a slightly higher age profile, including more mature students. The majority (60.3 per cent) of the undergraduates had received their prior education in the UK only, with a substantial minority (35.7 per cent) previously educated outside the UK. This pattern is reversed for the postgraduate students; in addition, postgraduates were more likely than undergraduates to have received prior education both inside and outside the UK (frequently this would be a student educated at an overseas high school who then took a first degree at a British university).

Table 1: Demographic Characteristics of the Sample

Category	Responses	Sex	Per cent	Age category	Per cent	Prior education	Per cent
School pupils	28	Male	57.1	13-14	100.0	Not asked	
		Female	42.9				
Undergraduate students	96	Male	47.9	19-21	43.4	UK	60.3
		Female	52.1	22-24	44.4	Outside UK	35.7
				25+	12.2	Both	4.0
Postgraduate students	67	Male	47.8	19-21	19.3	UK	26.9
		Female	52.2	22-24	49.4	Outside UK	55.2
				25+	31.3	Both	17.9



The questionnaire included three types of question. Scaled, pre-coded questions were used to measure frequency of media usage and perceived media trustworthiness. To measure respondent understanding of key health and nutritional terms both multiple choice questions and open-ended questions were used. For the multiple choice questions the respondents were given a selection of answers (plus a 'don't know' option) of which only one was correct. However, for a number of currently fashionable terms in food marketing - Omega 3, fatty acid, oily fish, prebiotics, probiotics and organic – the respondents were simply asked to define the term. The answers to these questions were post-coded into four categories: 'don't know', 'wrong', 'partly correct' and 'correct'.

## **Discussion of results**

### *Content Analysis of Newspaper Stories*

We identified 299 stories concerned with health and nutrition matters in a 3-month period in one publication (the *Daily Mail*) alone, suggesting that consumers are exposed to a vast amount of such information. All of the major stories in the newspaper were also covered by other mass media, including television and other newspapers, as well as featuring on internet sites. The number of articles in each of the six categories that emerged from the data is shown in table 2.

Table 2: Number of Articles by Theme September – November 2006

Theme	Number	% of total
New Treatments	127	42.5
Impact of Food / Lifestyle Choice	75	25.1
Disease / Health Risk, including Unintended Consequences	42	14.0
Foods / Vitamins as Disease Prevention	32	10.7
Food / Cosmetic / Environmental Contamination	19	6.4
Misleading Food Labelling	4	1.3
<b>Total</b>	<b>299</b>	<b>100</b>

As we explained in the Introduction, media coverage makes a real difference to consumers' health-related behaviours, and yet frequent concerns have been raised that such coverage can be sensationalist and may over-emphasise scientific results that are based on exploratory investigations. Our analysis shows that of 127 articles concerning new medical treatments 25 were based on preliminary findings. More broadly, the newspaper content analysis suggested that mass media coverage of health and nutrition matters does not discriminate sufficiently between established scientific knowledge and preliminary or speculative findings. In addition, there were clear examples where the newspaper's stance on an important health or nutritional issue ran counter to government policy. For example, in September and October 2006 the *Daily Mail* published several articles portraying the UK government's policies to improve the diet of school children in a negative light. Interestingly, the general tenor of these articles was that the government was interfering with freedom of choice – the expression 'school meal

fascists' being employed to refer to those who proposed that children should be prevented from taking unhealthy foods such as confectionery and crisps in their school lunches.

It has been suggested that a lack of understanding of science and mistrust of governmental advice lie behind people's lack of behavioural change in the face of substantial evidence regarding the effects of dietary and lifestyle issues on health and wellbeing (Sykes, 2004). However, it may be that many people do not have the capacity to understand the message owing to functional illiteracy. Most written health-related material uses wording that is too complex for many people to understand it (A. Adkins, Elkins, & Singh, 2001; Rudd, Moeykens, & Colton, 1999). The average reading skill of American adults is reported to be no better than the 8th grade (that is, pre-high school). The OECD-sponsored International Adult Literacy Survey conducted in 1996 indicates that this level is similar across most developed countries (Ministry of Education, 2004). However, most government and marketer-originated health literature is some three grades above this (Hoffman, McKenna, Worrall, & Read, 2004; Mumford, 1997; Wallace & Lemon, 2004). A considerable amount of material that has appeared in the Daily Mail is written at or above the 12<sup>th</sup> grade level (advanced high school level).

Some 20% of the UK and European populations are functionally illiterate, while a similar sized group can read at only very basic levels (Department for Education and Skills, 2003a, 2003b), so that 40% of the population are likely to struggle with many health communication messages. Similar figures are reported in America, where 21% of adult Americans do not have even elementary skills, leaving them unable to extract even simple information from printed material. A further 25% can perform basic reading tasks but cannot integrate or synthesize several facts from documents. A largely unidentified group could be classed as

'aliterate', in that they are able to read but choose not to, and rely on television rather than print media for news (Wallendorf, 2001: 506). Consumers with low literacy face considerable barriers when evaluating products and services, particularly in connection with analyzing written information such as nutritional content and claims (Ozanne, Adkins, & Sanlin, 2005). Identified coping strategies include relying on families and friends to make purchase selections, or limiting purchases to a narrow range of options with which they are familiar (N. R. Adkins & Ozanne, 2005).

Table 3 shows that of the articles analysed, most appeared to be at a level well beyond the reading ability of a major proportion of the population, indicating the potential for partial or incorrect conclusions to be taken from the material presented (the Table reports the SMOG grades, for an explanation of which please refer to the methodology section).

Table 3: Summary of SMOG Grades

<b>Number of articles at each level</b>	<b>SMOG Grades (American high school equivalent)</b>
1	18
3	15
5	14
13	13
22	12
13	11
6	10
<b>Total 63</b>	

*Questionnaire Survey*

Having examined the nature of the material that appears in the popular media concerning health and nutrition, in the questionnaire phase of the study we investigated young consumers' knowledge of and attitudes towards health and nutrition issues.

Table 4: Respondent understanding of key nutritional terms (open ended)

Concept defined	“Don’t know”		Answered wrongly		Answered correctly	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Prebiotics	179	94	9	5	3	2
Probiotics	172	90	11	6	8	4
Fatty acids	147	77	35	18	9	5
Oily fish	139	73	17	9	35	18
Omega 3	136	71	14	7	41	22
Organic food	104	54	12	6	75	40

Table 5: Respondent understanding of key health and nutritional issues (multiple choice)

Question	“Don’t know”		Answered wrongly		Answered correctly	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
‘If you have a BMI of 35, what does that mean?’	104	54	61	32	26	14
‘If you see a “reduced calorie” product, how many calories is that product allowed to have?’	100	52	54	28	37	20
‘A BMI is ...’	78	41	19	10	94	49
‘If a product is labelled “fat free” how much fat do you think can be contained in that product?’	33	17	44	23	114	60
‘A calorie is ...’	19	10	50	26	122	64
‘Roughly how many calories should you eat per day?’	15	8	50	26	126	66
‘What is the most efficient way to manage your weight long-term?’	15	8	50	26	126	66

Tables 4 and 5 show how good the respondents’ knowledge was concerning health and nutritional matters that are often discussed in the popular media. For the concepts listed in table 4 respondents were asked to define the term in their own words. The questions in table 5 were presented with multiple choice answers of which only one was correct. It is quite clear from table 4 that most respondents had very little idea of how to define a number of terms that are in common usage today in commercial and governmental nutritional communications. In each case the largest category is ‘don’t know’. The task facing the respondents for the data presented in table 5 was, of course, simplified, since they had only to tick a multiple choice answer rather than write a definition. Nevertheless, there is still a strikingly high number of ‘don’t know’ answers; for example, we were surprised that a majority of the young

consumers responding to the survey answered 'don't know' when asked a multiple choice question about the significance of a BMI of over 35 (a result associated with obesity, and a very high risk factor for type 2 diabetes, hypertension and cardio-vascular disease). Given the high priority attached to action to reduce obesity by governments in the developed world, it is a matter of concern that only 49.0% knew what a BMI (Body Mass Index) measured, and that only 14.0% knew the significance of a BMI of 35. In a separate dichotomous question 80.4% of the respondents said that they did not know their own BMI. There is evidence of considerable confusion surrounding the kind of nutritional claims made in food advertising – although a majority (60.0%) knew that a 'fat free' product contained less than 0.5% fat, only a small minority (20.0%) knew that a 'reduced calorie' product must have at least 25% fewer calories than the regular product. The general picture is one of patchy and often very poor knowledge of nutritional and health issues.

Table 6: Frequency of usage and trustworthiness of media for health/nutrition information

Medium	% using this medium DAILY or WEEKLY for diet or nutrition information	Ranking of media based on frequency of usage	Percentage finding this source of information 'TOTALLY' or 'HIGHLY' trustworthy	Ranking of media based on trustworthiness
Internet	72.8	1	30.4	5
Friends	65.4	2	53.4	2
Family	63.9	3	65.4	1
TV advertisements	60.2	4	18.3	8
TV news	58.1	5	35.1	4
Radio news	33.5	6	20.9	7
Magazine advertisements	32.5	7	17.8	9
Direct mail	29.8	8	16.2	10
Magazine editorial	28.8	9	21.5	6
Radio advertisements	28.3	10	12.6	11
TV documentaries	24.1	11	45.0	3
Cinema	12.6	12	10.5	12



The questionnaire asked respondents about their usage of media and about the perceived trustworthiness of media. Table 6 shows the percentages of respondents using 12 different sources of information ‘daily’ or ‘weekly’ for diet and nutrition information, and shows the percentages of respondents rating those sources of information as ‘highly’ or ‘totally’ trustworthy. We did not include medical professionals, such as doctors and nurses, as sources of information in the main study because we had found during the pilot study that this source was hardly used at all.

Table 6 shows the results for all respondents. Our sampling method enabled us to compare the results provided by university students (typically aged 20-24) and school pupils (aged around 14). However, there were few differences between the responses of these two sub-samples. For example, the top 5 ‘most used’ and ‘most trusted’ sources of information were the same for both groups; the Pearson rank correlation coefficient between the student rankings and the pupil rankings of all 12 information sources was 0.836 for ‘most used’ and 0.811 for ‘most trusted’ sources (both results indicate that the hypothesis that there is no underlying difference between the groups is accepted at better than the 0.1% significance level).

It is striking that four of the top five most commonly used sources of information are also in the top five most trusted sources of information: the Internet, friends, family, and TV news. While TV advertisements are the fourth most commonly used source of information, they are ranked eighth in terms of trustworthiness. In general, as might be expected, commercial sources of information (advertising and direct mail) are not regarded as highly trustworthy. TV documentaries are regarded as a highly credible source, but are used less than other media to obtain health and nutrition information.

Friends and family are used as an important source of health and nutrition information by the young people in our survey, and are also regarded as highly trustworthy. In terms of the integrative model of behavioural prediction and change (figure 1) this supports the importance of norms in formulating intentions and behaviours concerning nutrition and a healthy diet. In relatively few cases (for example, in cases where a family member is a medical professional) can family and friends be considered to be independent sources of objective health and nutrition information. The influence of family and friends is very likely normative, rather than objective. In many cases, no doubt, family and friends act as conduits for knowledge acquired from the other sources of information listed in table 6. For example, based on readership information it is very unlikely that the young people in our survey would obtain information directly from the newspaper that we used for our analysis of stories in the media, the Daily Mail. Nevertheless, it is likely that they are influenced at second hand by stories that appear in the Daily Mail, since firstly, (as we discussed above) this newspaper counts millions of middle-aged people in socio-economic categories C1 and C2 among its readers and, secondly, the survey respondents cite 'family' as the most trusted source of nutrition information.

The answers to a number of supplementary questions asked on the questionnaire suggested a degree of disinterest or complacency. About a fifth of respondents (20.2%) indicated that they were 'disinterested' in the public debate about growing levels of obesity and the majority (56.4%) had taken no action to change their diet or lifestyle because of the obesity debate. Where respondents were invited to provide any further comments, one wrote 'don't know and don't care', while another wrote 'boring – you only live once'; when they were asked to nominate their preferred method of receiving health and nutrition information over

80% indicated that they did not want any information. Of those who did specify a preference, the most popular methods to receive information were (in rank order) TV, Internet, email, and ‘personalised or customised information’.

The general picture is one of relative ignorance and a degree of disinterest in the public debate about health, nutrition and obesity. Family and friends are regarded as the best, most trusted sources of information about health and nutrition. The Internet and TV news are also regarded as important and credible sources of information – this may be a matter of concern given that many health-related Internet sites are of dubious value. However, electronic media have the potential to provide individuals with personalised health and nutritional plans based on answers to online health questionnaires. The advantages of computer-based and web-based tailored nutritional education have been demonstrated in recent studies in the Netherlands (Brug, Oenema, & Campbell, 2003; Oenema, Brug, & Lechner, 2001).

## **Conclusion, implications for policy and for research**

There is widespread concern across most of the western world that poor dietary choices have already brought about a substantial increase in obesity, and will in the future lead to higher levels of ill-health, increased public health spending, and lower life expectancy (Enns, Mickle, & Goldman, 2003; Oenema, et al., 2001; UK Department of Health, 2004; US Department of Health and Human Services, 2005). There is a growing political consensus that public policy interventions are required in order to improve the long-term health of citizens and to improve health and nutrition among young people. We agree with those who have argued that social marketing can play an important role in changing this behaviour (Andreasen, 2002; Rothschild, 1999).

If we are to bring about desired changes in food consumption, then the Fishbein and Capella (2006) integrative theory of behaviour change suggests that the three main available mechanisms are to change attitudes, to change norms, and to change self-efficacy beliefs. Our research has shown that one specific, important target group – young consumers in full-time education - is generally ignorant of and disinterested in issues to do with nutrition and health. The source of information that they rely on most, and that they trust most, is friends and family. From our investigation of the literature, we have established that, more generally, information about nutrition, diet and health – particularly in text form – has to overcome the substantial difficulty that a large proportion of consumers even in rich countries such as the USA and the UK have very limited reading skills.

Figure 2: Practical Implications of the Integrative Theory of Behaviour Change

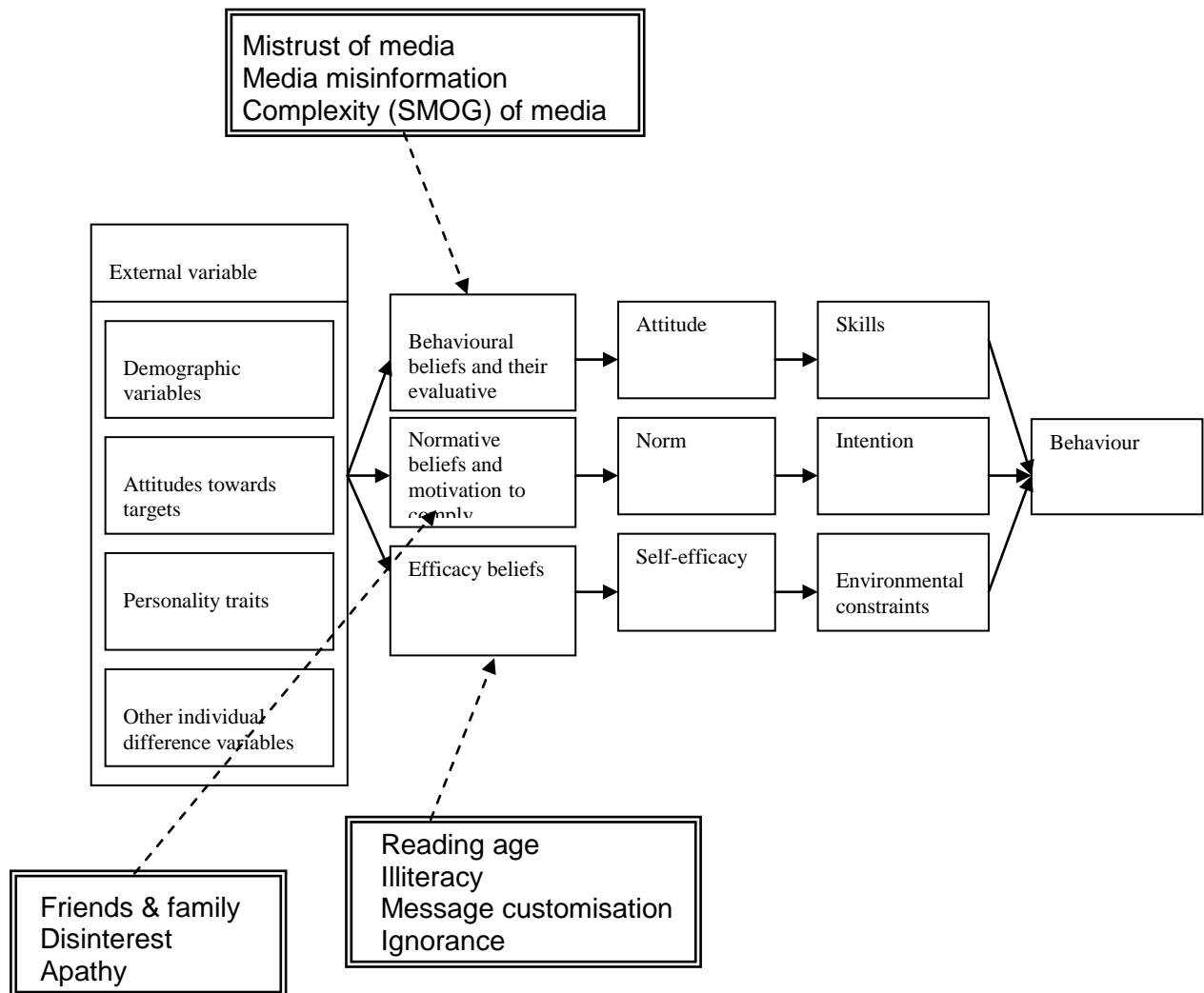


Figure 2 transfers the key findings from this study to the framework provided by the integrative theory of behaviour change. Normative beliefs about nutrition and health are heavily influenced by friends and family. Among the young consumers whom we investigated there is a substantial degree of disinterest and apathy. Even among this relatively well-educated group (our sample included 96 people studying for a first degree and 67 people for a second degree) there is grave cause for concern about their ignorance of basic nutritional and health-related information. Among the general population, the ability to respond to health and nutrition messages (efficacy) is severely constrained by high levels of illiteracy or poor reading skills. Generally, behavioural beliefs about health and nutrition are

influenced in unpredictable and not always desirable ways by the mass media. For example, the newspaper that we examined in depth often reported speculative or exploratory scientific studies as though they were ‘fact’, and in some cases took a prolonged stance that ran counter to the best available scientific evidence. The SMOG analyses suggested that in many cases the food and nutrition stories were too complex to be easily understood by the average reader.

In policy terms the key message that emerges is the need to develop initiatives that deliver personal, customised messages rather than generic communications initiatives that exhort consumers to eat healthier foods. While, in the past, tailored communications messages designed individually for millions of consumers would have been impossible, new media such as the internet and mobile telephony (including SMS messaging) and new marketing techniques such as customer relationship management (CRM) potentially provide the means to achieve mass customisation. The first step would be to provide lifestyle and nutrition diaries and calculators online, perhaps initially targeted at consumers identified by medical practitioners as ‘at risk’. These could be combined, for example, with daily SMS message ‘prompts’ to complete the daily diet and exercise diary. It is important that consumers be convinced that their individual self-interest is central to the communications program, rather than perceiving it to be part of a generalised, impersonal educational campaign (Rothschild, 1999).

SMS has been found to be successful in a variety of settings including healthy eating, medication compliance and out-patient attendance (Downer, Meara, & Da Costa, 2005; Rodgers, Corbett, & Bramley, 2005); patient response has generally been positive (Gerber, Stolley, A.L., Sharp, & Fitzgibbon, 2009). Rhee, Nyquist, Garden-Robinson and Brunt (2009) have shown that SMS delivery can be successfully augmented by online delivery.

They used a web-based class-management system (Blackboard) successfully to deliver online health messages, improve food choices and increase physical activity among students. As Tapscott (2008) has observed, members of the 'net-generation' of young adults who have grown up with the internet, often use multiple media at the same time, largely with syndicated and shared content, which is largely co-created or user created. Indeed it seems that YouTube, Facebook, MySpace and Twitter are the fastest growing sources of health information for young adults (Vance, Howe, & Dellavalle, 2009), even though much of the this user generated health information is of dubious quality, suffering from limitations such as blind authorship, lack of source citations, and the presentation of opinion as fact.

Despite their weaknesses, we contend that these new media, frequently merging mobile, internet and social networking technologies, offer a potential mechanism to spread healthy eating messages, by creating 'buzz' and engaging young people on their own terms. They are particularly useful to mix user-generated and mass-customised messages to achieve user engagement and support. An example of such usage is the commercial uses of web 2.0 technology, successfully mixing user generated content with customised support messages. For example, the Nike+ system uses a chip in a compatible shoe to send running performances for individual, subscribed runners to a Nike owned website. Users can then rapidly disseminate individual running results using RSS and API technology to their friends on other social networking sites such as Facebook, social mobile networking and blogging sites such as Twitter and even other online communities, for example fitness communities such as Dailymile. In return, users of the Nike+ system get mass customised training materials delivered through these sites, which take account of the individual training pattern and past runs, and develop an individual (or mass-customised) training plan for each runner. Further, users can take part in virtual running groups, exchange information about nutrition,

health or arrange real-life running partnerships. Similarly, friends (or perfect strangers) of the users can further encourage the runners by send them virtual cheers, challenging them to runs or, in the simplest form simply by ‘liking’ their update. Equally, through the rapid dissemination to the many contacts a net-generation citizen may have, awareness is raised about the achievements, which then may prompt nudges and discussions in the real world. For example, people who are losing weight using one of the many Twitter tools available for the purpose may encourage real-life contacts to comment on the weight loss information that has been disseminated on Twitter, providing additional support and encouragement. Although formal research is as yet sparse, observations made at websites such as Twitter and Nike suggest that young people use mobile, internet and social networking technologies to gain access to health and fitness information, to exchange information, to generate their own content, and to receive feedback and encouragement, and that this results in behavioural change. Consequently we argue that in trying to communicate healthy-eating messages to young people governments and other interested parties will need to use the media that young people themselves use.

The study that we have described in this paper lends itself to extension in a number of directions. First, we believe that it is important to extend the study to other age cohorts, particularly to younger schoolchildren and their parents. Today’s schoolchildren are the age cohort over which the greatest concern has been expressed by policy-makers, and we have seen that their parents represent an important normative influence on their behaviour. Second, longitudinal replication of this study will be important to track consumer health and nutritional knowledge and attitudes as government policies are implemented to try to improve consumers’ nutritional choices. Thirdly, we would suggest that in-depth research techniques with individual consumers are necessary to establish how personalised nutrition and health



messages can best be prepared and delivered, and how their effects can be measured. In the present study we have not directly investigated young people's perceptions of the content of the health messages which they encounter (for example, their degree of scepticism), nor the effect on those messages of being transmitted to young people via family and peer-group members (for example, the extent to which messages are distorted by this process). These are important areas for further research.

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