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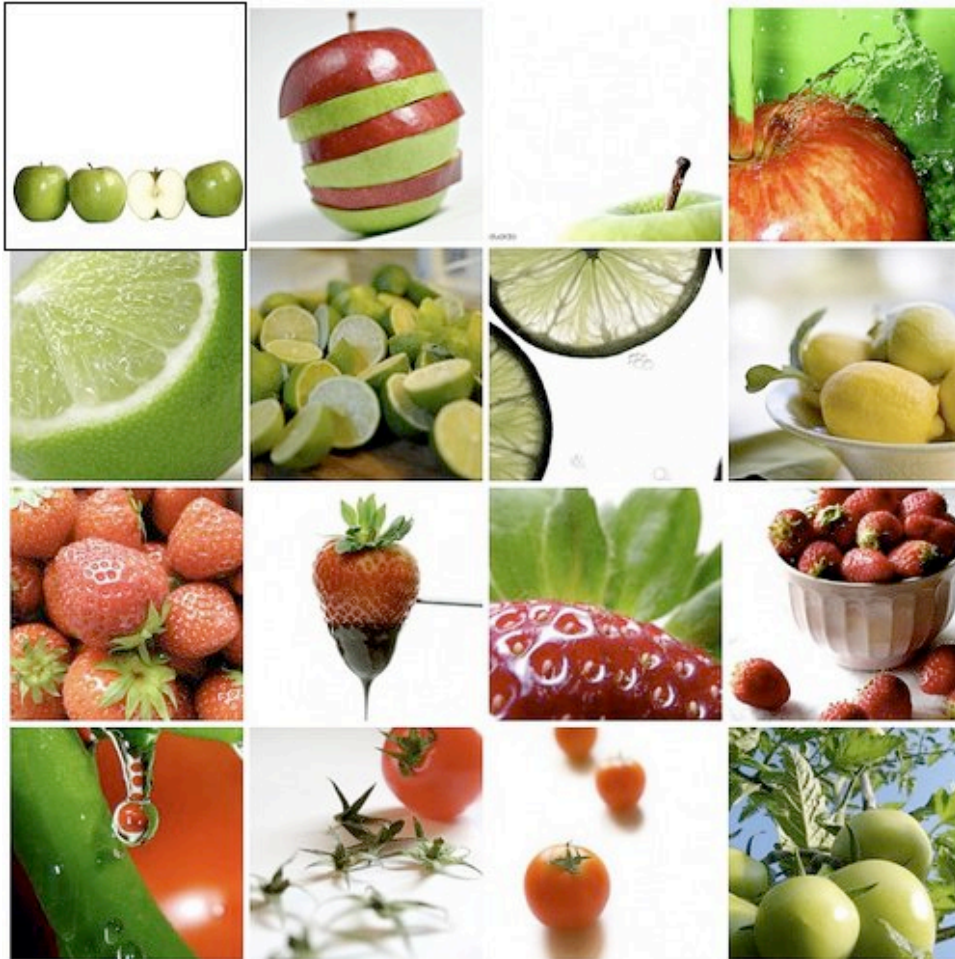
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# Encouraging healthy eating behaviours through healthy eating environments. Case of Durham University



**Iliana Velinova**  
**Master of Arts by Research**  
**Durham University**

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## **Abstract**

The aim of the study was to perform a formative research by exploring, describing and evaluating at the same time on various factors that influence eating behaviours on campus. The study looks at the situation of Durham University's college catering system and students' eating practices, needs, barriers to eat healthy, and explores how the upstream social marketing approach could be advantageous in creating healthy eating environments.

The report notes inconsistencies in strategy implementation within Durham University's catering initiative to provide students with nutritionally balanced meals and nutritional information, ultimately trying to promote healthy intakes. Great number of students suggested that meal offering was a barrier to making healthy choice. Most students were not generally aware of their personal nutritional requirements, indicating a knowledge gap, even for those who considered healthy eating important.

Findings, confirmed through the research, indicate that a considerable element in the creation of healthy eating environments at Durham University's colleges lies within the provision of nutritionally balanced meals and the adoption of more effective means of communicating nutritional information to students and encouraging them to make healthy choices.

# CHAPTER 1 INTRODUCTION

## ***OVERVIEW***

The introduction starts by engaging in an explicit discussion of healthy diet prevalence, the scope of the problem and consequences of unhealthy eating behaviours and their economic costs. The report goes on to review common governmental policies and practices aimed at solving the health problem. The degrees of implementation and coverage of those initiatives, their success, as well as common problems associated with their implementation, are discussed briefly to allow the full examination of the current situation within the health promotion and social marketing domains. This research project ultimately addresses the prevailing pattern of unhealthy eating among college students at Durham University.

A century ago, people were more concerned about ensuring caloric sufficiency to meet their energy expenditure needs. Nowadays, people are still confronted with under nutrition, but of a different type. Increasingly, people all over the world are shifting towards the so-called Western diet. Statistics of obesity rates show that occurrence has increased proportionally with dietary fat as a percentage of our calories having increased proportionally with the growth of obesity. Longitudinal studies show with certainty that a high percentage of dietary fat in the human diet leads to numerous degenerative diseases including obesity, diabetes, different types of cancers, and diseases of the heart are among the most prevalent. As a society, we have moved well beyond the era when our dietary focus was on ensuring caloric sufficiency to meet basic metabolic needs. We are now confronted with nutritional inadequacy of a different sort. Diets that are high in calories and other nutrients such as saturated fats and low in certain nutrients are putting adolescents and young adults at risk of diseases later in life, such as heart disease, stroke, circulatory problems, cancers, diabetes and osteoporosis. Parents, communities, the government, public sector, health care systems and private enterprise all face significant challenges to create an environment for the whole population that turns the course and



enhances their prospects for healthier lives.

One of the leading experts in the psychology of eating and Director of the Food and Brand Lab at Cornell University, Dr Brian Wansink, claims that “people consume with their eyes not with their stomachs” (Wansink & Sobal, 2007 p.112) and that we are much more influenced by external factors like smell, look and taste, rather than internal cues like hunger and thirst. The greatest influencers to our behaviour and a major hindrance of performing healthy behaviour are external stimuli (Wansink, 1996, 2004, 2005, 2006). Behavioural research (Kahneman, 2003; Koster, 2003; Wansink, 2004 McKinnon et al., 2009; Kremers & Bruijn, 2007; shows that triggers from the environment influence human actions, even when they are inconsistent with the individuals’ intentions and planned actions towards the behaviour (de Ridder et al., 2009). Wansink adds that in today’s cluttered food environment, with cheap food being on offer everywhere, we have to make over 200 decisions a day related to food. In addition to that, with so many decisions taken every day, the possibility to make mistakes, or literally give in to temptation, increases every time we have to make a decision. So each time one experiences a food cue in some form, whether it be the tempting smell of freshly baked baguettes when you pass by a bakery, people make unconscious choices whether to grab it or pass it. This ready availability of highly palatable but unhealthy foods means that if people are attempting to eat healthily, they must constantly balance between effortfully enacting their healthy intentions and effortlessly indulging in palatable but unhealthy snack foods.

## **1.1 WHAT IS HEALTHY EATING?**

### **Healthy Diet Defined**

The term “healthy eating” has been defined by researching the term and its meaning in papers of medical and health organizations. Below are the sources where the term healthy diet was defined.

*Health and Safety Executive’s (HSE) <http://www.hse.gov.uk/>*

*Food Standards Agency (FSA) <http://www.food.gov.uk/>*

*British Heart Foundation (BHF) <http://www.bhf.org.uk/>*

*World Health Organization (WHO) <http://www.who.int/>*

Healthy eating can be summarised by the following: consuming a diet that promotes health and prevents disease (HSE 2006, FSA, 2006; BHF, 2008; WHO, 2004, WHO 2008). This means an intake comprising adequate amounts of vitamins, minerals, fibre, and a balanced supply of carbohydrates, proteins and fat (WHO, 2004, WHO 2008). In addition, healthy diets are naturally low in sugar and salt; balance is key to the definition of eating well (HSE 2006, FSA, 2006; BHF, 2008; WHO, 2004, WHO 2008).

“NHS defines a balanced diet as maintaining healthy weight and avoiding health problems:

- eat plenty of carbohydrates
- eat at least five portions of fruit and vegetables every day
- cut down on the amount of fat, sugar and salt in your diet
- eat enough vitamins and minerals
- drink enough fluids” (NHS, 2009)

According to the latest dietary recommendations for intake of dietary nutrients, dietary fat should not exceed 25-30 % of total calories (See Appendix: Dietary Guidelines).

## **1.2 THE HEALTH BURDEN OF UNHEALTHY EATING**

Maintaining healthy eating lifestyles has been a profoundly researched topic in dietetics, nutritional and food sciences, as well as public health research and a variety of governmental and internationally recognized health organizations. They have all been single-minded on one thing: that the foundations of long-term wellbeing for humans lies in healthy eating principles maintained throughout life (WHO 2004, ADA 2004, DPAS, WHO, 2008).

Healthy diets, high in whole grains, fruit and vegetables have also been shown to promote protection from various degenerative diseases (Campbell, 1998; World Cancer Research Fund, 1997; Jacobs, 1998; Potter, 1996; Cummings, Bingham, 1998; Armstrong, Doll 1975; American Institute for Cancer Research, 1997). What is more a number of research

bodies suggest that lifestyles factors alone can prevent and treat chronic diseases (McCarty, 1999; Craig B. Sommers, 2006; Jenkins et al., 1997; HSE 2006; WHO, 2008; Mokdad et al., 2004, 2005). These widespread diseases include most types of cancers, heart disease, diabetes and other diseases that affect later quality of life and decrease life expectancy.

Every year in Europe about 86% of premature deaths are due to one of the top four killer non-communicable diseases: heart conditions, obesity, type 2 diabetes and cancers, all positively associated with lifestyle and mainly dietary behaviours (HSE, 2006; Rayner & Scarborough, 2005). This increased occurrence of obesity amplifies the risk of today's young adults developing various types of nutrition related diseases, which they would face later in life (Mathers & Loncar, 2006). Dietary behaviours have been proven to play a critical role in the long-term, to influence the quality of life and health of individuals (WHO, 2004, 2008). A number of studies have estimated that 80% of all chronic diseases, a leading cause of death today, could have been avoided through change in lifestyle and in particular through healthy eating, which alone has 35% influence over individuals' long-term well-being (HSE 2006; DPAS, WHO, 2004; Rayner & Scarborough, 2005; White, 2003).

What is disturbing is that deaths caused by chronic diseases are expected to increase by 17% between 2006 and 2015, accounting for nearly 70% of global deaths by 2030 (Mathers and Loncar, 2006). In a study sponsored by the World Health Organization (WHO), Mathers and Loncar (2006) project that non-communicable diseases will be the leading causes of ill health by 2030. Diseases like cancers, cardiovascular disease and diabetes are going to further increase as a leading cause of death. Even according to their most optimistic predictions non-communicable diseases will remain the leading cause of poor health (Mathers and Loncar, 2006).

Despite longitudinal public health campaigns targeting improving individuals' health by reducing occurrence of high cholesterol levels, diabetes, heart disease and high blood pressure, results have been limited. For example, programmes targeting reduction of risk

factors associated with heart disease had limited results (Schwab and Syme, 1997; Farquhar et al., 1990); high blood pressure occurrence has actually increased from 21.7% 1988-1994 to 27.5% in 1999-2000 (NCHS, 2004); obesity conditions actually have increased from 23.3% to 31.1% (NCHS, 2004).

### **1.3 OBESITY**

Obesity conditions have been directly linked to a wide spectrum of diseases, and more specifically to heart conditions, type-2-diabetes, some cancers, musculoskeletal disorders and disorders due to quality of life such as arthritis, respiratory difficulties, skin problems, sleep apnea, infertility and more (WHO, 2000). Being overweight or obese increases an individual's risk of developing additional complications of an already existing illness (Ernersson, 2010), as well as a variety of psychosocial problems (Ernersson, 2010) including self-esteem disturbances, eating disorder development and depressive conditions (Friedman, 1995; Wadden, 1993 & 2002; Ernersson, 2010), including employment discrimination and academic discrimination (AOA, 2005). According to NHS data, 25% of mortality rates over the past 30 years were due to obesity complications. Since then obesity rates have tripled in occurrence and the current trend is that they will continue to increase year-by-year at least by 2030 according to Wild et al. (2004). In 2007, the overweight population in the UK accounted for 61% and the obese for 22.7% according to the WHO Health Survey for England and those numbers are expected to rise further.

Promoting healthy eating choices is of primary importance for society's longevity and wellbeing, especially when we have the knowledge and resources to achieve this attainable goal. Science-based dietary guidelines have been established by a number of industrialized countries (see for example DHHS & USDA, 2005; Health Canada, 2007) and internationally by the World Health Organization (WHO, 2004) in order to provide guidance to consumers on the composition of a healthy diet. It is recognized, however, that many consumers struggle to align their diets with these recommendations (Blaylock, Smallwood, Kassel, Variyam, & Aldrich, 1999; Kumanyika et al., 2000; Pronk et al.,

2004; Shepherd, 2006; Srinivasan, 2007). Healthy choices are often difficult for anyone to make, but where people do not feel in control of their environment or their personal circumstances, the task can be more challenging. What is more, it is important to note that individual behaviours do not occur in isolation to historical context, social conditions and social policies, as well as economic conditions and economic policies (Lantz et al., 1998; Adler et al., 1997; Berkman, 1984; Berkman and Breslow, 1983). Behaviours are determined by the factors from the individuals' environment. A number of studies have demonstrated the link between poor food choices and social, economic, legal, and policy factors (Popkin, Duffey and Gordon-Larsen, 2005), including physical surroundings, time, location and history (Devine, 2005), ambience factors (Stroebele, De Castro, 2004).

## **1.4 POLICY ISSUES**

The dramatic rise in the proportion of the UK population who are obese, have type 2 diabetes, and are in risk of developing obesity and related chronic diseases, is a matter of national concern (Moon et al., 2007; HSE, 2006; Hossain, Kavar & Nahas, 2007; Wild et al., 2004; WHO, 2004, 2008). Increasingly attention has been put on creating healthy eating environments in schools. Dietary patterns shape the health profiles of not only British students but students from more than a hundred different nations. There are indications from various groups for the pressing need for change in eating behaviours. However, the efforts have been considered limited in terms of “(1) inadequate emphasis on the advocacy role in public health, (2) limited expertise in advocacy skills among current health practitioners, and (3) lack of training of public health students and practitioners in advocacy skills”(p. 39). In addition, public health programmes face “a hostile public health marketing environment” (Siegel & Lotenberg, 2007, p.39), where commercial spending on advertising products harmful for individual's health significantly outnumbers health improvement programmes.

Recently policy changes regarding food served in public institutions have also taken place (FSA, 2009). Those regulations have been set only as recommendations for most public institutions. The only exception, where these regulations were set as obligatory, is

for meals served in primary and secondary educational institutions. Therefore, meals served in higher educational institutions have to follow the suggested recommendations (FSA, 2010), and confirmed by the Food Standard Agency (FSA) (2010)., The FSA, which deals with protecting health and consumer interests in relation to food, has created the Eatwell Plate to provide guidance for the general population on what they should consume in order to maintain a balanced diet. The Eatwell Plate represents the proportion of foods that constitute an overall healthy diet. However, the Eatwell Plate provides only general guidelines, and does not provide quantifiable information about how much of what should be consumed. This issue can prove to be problematic, according to experts (Wansink, 2009; Nestle, 2004; Contenton, 2007; Ammerman et al., 2002), in the sense that even if you eat according to those recommendations you can still end up getting more calories and increase weight and increase chances for developing health complications thus diminishing the quality of later life. A rough estimation is that just an extra 50 calories a day could make a profound increase in weight in the long run (Wansink & Huckabee, 2005).

Policy reforms aims to improve the health and wellbeing of the population by promoting healthy eating lifestyles by setting guidelines on food preparation and nutrient content, which help the customer to make informed food choices. However, there were some controversial findings by Aron, Evans & Mela (1995) that people do not always choose the healthy alternative when provided with nutritional information. These are rather guided by various other factors (Elaine, 1999; Kahneman & Tversky, 1983; Koster, 2009). Therefore, more than ever policy has paid attention to improving health education and reversing obesity in adolescents and young adults. Efforts by governmental and non-governmental organizations are targeting young people, who have the greatest likelihood of learning about healthy eating principles, acting upon them and sustaining them in the long run (Koster, 2009).

## **1.5 THE ECONOMIC ARGUMENT**

Along this initiative sits the economic argument that changing behaviour is more cost effective than treating the long-term effects of unhealthy eating behaviours. Increased health care costs are a main concern for government officials because of the treatments associated with long-term health conditions. Thus, chronic diseases worldwide are increasingly seen as both a public health and an economic issue (Cash et al., 2006). The UK's government spending has increased more than ninefold from 1981 to 2011. In addition, indirect economic costs in terms of the workforce, more sick days, absenteeism, and decreased productivity add further complications to the problem, and require urgent governmental actions. The cost of obesity to society is still not clearly defined. However, there are a number of studies that have attempted to produce a monetary estimate.

The primary reason to put a cost on obesity is to assist policy makers in conducting cost-benefit analysis of potential and current prevention policies. These policies are mainly based on the assumption that obesity is the consequence of bad lifestyle and nutrition choices and it leads to bad health, which in turn generates costs to individuals and society in general. However, Oliver (2006) argues that bad nutrition choices generate bad health but obesity is not necessarily the missing link.

The cost of obesity to society can be estimated through a quantification of its direct and indirect costs. The direct cost of obesity is estimated as the total incurred expenses by the health care system while the indirect cost is attributed to lost productivity among the workforce.

According to a study by the National Audit Office (2001) in the UK the medical (direct) costs of overweight and obesity are estimated to be £500 million (\$1 billion). 50% of this cost is attributed to prescriptions, 40% to hospital costs, and 10% to GP services. A more recent estimate from the UK government Foresight Report (McPherson et al., 2007) sets the medical cost of obesity and overweight at £1 billion (\$2 billion). The study even goes further by producing an estimate of the direct costs up to 2050. Assuming that the current trends continue the bill should go up to £7.1 billion. This means that the proportion of

health care cost attributed to obesity and overweight will rise from 1.4% to 10.1%. Currently, these medical costs represent less than 0.5% of GDP (McPherson et al., 2007).

Popkin et al. (2006) allow dietary factors to have direct impact on health in addition to the indirect effects caused by obesity. The study estimates that in China the combined direct and indirect effects of diet contribute \$3.9 billion to medical costs. Popkin and his colleagues conclude that diet-related costs represent about 0.3% of GDP.

Critics to the above studies point out that measuring lifetime medical cost rather than annual medical costs is more appropriate. A recent study conducted in the Netherlands supports this argument. Van Baal et al. (2008) discovered that cumulative medical costs from age 20 onwards are higher for those of normal weight compared to obese and overweight people.

The UK National Audit Office (2001) study also estimates the indirect cost of obesity. The study attributes 6% of deaths to obesity-related causes from which more than a third occurred before retirement age. The estimated lost earnings resulting from that amount to £827 million (1998) in addition to the £1.3 billion for days missed from work related to obesity. The total amount represents 0.2% of GDP which equals the cost assigned to health care. However, McPherson et al. (2007) argue that there is little certainty about this figure which could be in excess of £10 billion per year.

## **1.6 FOOD ENVIRONMENT**

Today's industrialized food production made possible the abundance of cheap calories everywhere at any time. Processed foods, a result of industrialized food production, made possible the creation of cheap and tasty foods. Those foods offered convenience and immediate satisfaction of hunger. What has changed in 50 years is that we are now constantly being stimulated to consume. While these quick, cheap and convenient solutions, temporarily satisfy our calorie needs and hunger, these high calorie alternatives to nutritious meals have been regarded as "junk" food. "Junk foods" was a term first used by Michael Jacobson (1972), since they do not have nutritional value, rather they provide



only empty calories. They are also considered unhealthy because they do not provide any health benefit but provide an excess of calories, saturated fats and sugar. Examples of those foods include: hamburgers, crisps, French fries, pizza, cakes, confectioneries, chocolate and others. Consumption of junk foods in rats has shown that it triggers reward homeostasis, similar to the addictive effect of cocaine and heroine on the brain (Johnson & Kenny, 2010). Authors of same study claim that overconsumption of such foods “produces addiction-like neuroadaptive responses in the brain reward circuits and drives the development of compulsive eating.” These characteristics are often associated with people eating unhealthy, craving food and not getting satiated (Roefs et al., 2006). Moreover, what Johnson and Kenny (2010) found was that after the fast-food diet, when rats were introduced to the healthy food, they refused to eat it and even starved for two whole weeks. This provides a partial explanation why some people cannot eat healthily despite the great efforts they make; high-fat and hi-sugar foods are so stimulating that people do not want to replace them with anything else.

Moreover, marketing efforts to promote these foods have further complicated the issue. According to experts, “we are now more than ever before bombarded with food marketing messages which present additional stimulus for the brains” (Pollan, 2007). Those marketing efforts have been mainly targeted to the youngest part of the audience, aiming to establishing a life-long loyalty to their brands, as well as leveraging the youngsters’ influence on the purchasing behaviour of their parents (McNeal, 1999). It has been widely recognized that since an early age children recognize fast-food brands (Fisher et al., 1991; Henke, 1995), while having difficulty recognizing common fruit and vegetables (Jamie Oliver’s Show, 2009). Marion Nestle (2002) comments that what is even more interesting is that spending on food advertising has been unproportionally distributed compared with the generally accepted guidelines for healthy eating. She estimated that around 70% of advertising on food is spent on “convenience foods, candy, snacks, alcoholic beverages, soft drinks and desserts” (p.22).

## **1.7 REASONS FOR STUDYING STUDENT POPULATIONS AT COLLEGE**

So why would we target the student population at large? There are several reasons. Firstly, today's young adults are future leaders shaping the future of the society; they are also tomorrow's workforce. They are tomorrow's parents, who will have greatest influence over their kinds of eating choices (Kral & Rauh, 2010). Moreover, in their study of generation Y-ers, Yarrow and O'Donnell (2009) bring out some interesting findings about that generation of today's teens, 'tweens' and twenty-somethings. This generation of pre-teens to young adults, born between the late 1970s and 2000, are regarded as the most "influential generation", "most educated", "non-susceptible to marketing tactics" informed by the internet and respecting honest brands (Yarrow & O'Donnell, 2009, p.27). They are also proactive and an information empowered generation, making them an attainable target of messages, they listen and think over and process information like no previous generation. A potential, drawback, however, is that generation Y-ers have short attention spans and seek immediate gratification. They even have influence over older generations, whether it is their parents, whose eating behaviours and habits, including food preferences, are generally difficult to change. These findings create an opportunity to influence simultaneously not only the Generation Y themselves, but their parents as well as their own kids. Moreover, generation Y-ers behaviours are particularly modifiable (Steptoe et al., 2002) compared to those of older populations' eating behaviours, considered especially difficult to change (Hare, et al., 1999; Wadołowska et al., 2009). These factors present an opportunity for public health marketers, like never before, taking advantage of the thirsty for information and ready to change generation Y-ers. Another reason that this report targets student populations is the infamous quality of student diet on campus. Entering college is generally a key transitional period for young adults as they face challenges adjusting to new surroundings, workloads, experiencing of stress (Dodd et al., 2010; Economos CD, Hildebrandt MPH, Raymond, 2008; Pliner P, Saunders T. 2008) and many will have greater lifestyle freedom than before (Arnett, 2000). Often these changes are associated with weight gain (Racette et al., 2005; Levitsky, 2004; Anderson, Shapiro and Lundgren,

2003; Racette et al., 2003) and low intake of fruit and vegetables and unhealthy eating (Dodd, 2010; Dinger, 1999). An increased consumption of food and beverage products among student populations in particular has been shown to be high in total calories, sugar, salt, fat and low in nutrients (Steptoe, Wardle, 2001), (Steptoe et al., 2002), (Dodd et al., 2010). A study on European health and behaviours has estimated that students' fruit consumption has decreased between the years 1990 and 2000 (Steptoe et al., 2002, Steptoe and Wardle 2001), which is quite disturbing bearing in mind the well documented evidence of benefits associated with fruit and vegetable consumption (WHO 2003, FSA 2005). In other studies, students report consuming too much dietary fat and processed carbohydrates (Kristin et al., 2009; Morse and Driskell, 2009; Dinger, 1999). Such dietary behaviour can cause of a number of adverse consequences on the development and sustainment of unhealthy dietary habits (Koster, 2007). Established dietary behaviours are more difficult to influence in individuals who have been on an unhealthy diet for long periods (Hare, et al., 1999). These people also they experience greater difficulties in sustaining healthy eating patterns because of the already established habits. Therefore, it can be concluded that the sooner people are primed to eat a healthy diet, the easier it would be for them to make the transition to a healthy diet and the higher success dietary interventions would have. A number of studies have shown that dietary intakes influence students' performance (Florence, Asbridge and Veugelers, 2008; Kleinman et al., 2002; Simontacchi, 2000). Professor Philip James, from the London School of Hygiene and Tropical Medicine, in his speech in front of the American Association for the Advancement of Science (AAAS) referred to today's young adults as "disadvantaged from birth, their academic achievement is impaired, their earning power is diminished, and they almost certainly have a life expectancy which is less than that of their parents" in response to current nutritional trends (Briggs, 2008). According to him, nutritional "deficiencies" will not be solved by minor changes in people's behaviour; rather policy and regulatory actions targeting the food and drink industry are necessary.

Studies on students' diets also found that they experience significant difficulties in eating healthily in college (Cluskey & Grobe, 2009). Also, despite students being generally familiar with the health-related consequences of unhealthy eating behaviour (Steptoe and

Wardle, 2001), they still fail to comply with them (Kolodinsky et al., 2007). There is a need for healthy eating education and interpretation of nutritional labelling (Misra, 2007). Explanations for the gap between nutritional knowledge and actual behaviour have been grouped into several distinctive categories. Greaney et al. (2009) and Nelson et al. (2009) have found similar factors that act as barriers to students in executing their healthy eating. These include intrapersonal, related to experiencing difficulty controlling own eating behaviour, interpersonal, being influenced by social situations, and environmental, time and food availability. Understanding the complexity of those factors, however, creates an opportunity for public health experts in that it allows them to plan and put into practice such programmes that specifically take into consideration healthy eating enablers.

## **1.8 THE SOCIAL MARKETING INITIATIVE**

The topic of the dissertation, “Encouraging healthy eating behaviours through creating healthy eating environments”, rests in the field of Social Marketing. Social marketing was established as a distinct discipline when Philip Kotler and Gerald Hastings realised that marketing principles could be applied to individual behaviours that would benefit the individual or the society at large and was termed by Kotler and Andreasen as “seeking to influence social behaviours not to benefit the marketer, but to benefit the target audience and the general society.” (Kotler et al., 2002, p.394) In contrast to traditional marketing, it does not aim to benefit the marketer. Social marketing has evolved through the years. From purely advertising messages, that inform about the benefits or hazards associated with certain behaviours, to more sophisticated ones that help facilitate behaviour change initiatives.

Social Marketing utilizes the four core features of conventional marketing, which include “product”, “price”, “place”, “promotion” (Siegel and Lotenberg, 2007). However, in social marketing, the “product”, usually refers to particular behaviours that are either promoted or discouraged among certain groups of the population. In the present study, for example, the “product” would be the practice of “healthy eating choices”. The “place” would be Durham University’s college dining halls, the “price” would be the “perceived difficulties” that students face in practising healthy eating, and the “promotion” element

would be the provision of nutritionally balanced meals as well as the establishment of effective communication channels to promote and encourage informed food choices.

In recent years, social marketers have made use of sophisticated formative research methods to investigate the populations at risk, environments where behaviours take place as well as other influential variables when designing social marketing programmes. Rothschild (1999), Andreasen (2006), and Siegel & Lotenberg (2007) conceptualise three distinctive domains of research application as effective social marketing programmes to three distinctive domains: education, marketing and law.

The education domain: “messages of any type that attempt to inform and/or persuade a target to behave voluntarily in a particular manner but do not provide, on their own, direct and/or immediate reward or punishment” (Siegel & Lotenberg, 2007, p.25). Education makes use of messages that inform the public but does not inform explicitly about consequences of behaviour; rather it raises awareness to persuade individuals to engage in these behaviours. The target audience is expected to self-engage rather than be presented with the benefits of behaviour exchange, as communicated explicitly in marketing messages. Education messages are essential to integrated social marketing campaigns and often utilised as reminders (Tobias, 2009) to perform specific behaviours. Example of such are: “Eat your 5 a day” (NHS, 2010) or Eat Your Greens (BHF, 2009). These messages emphasize scientific findings and the recommendations communicate these results (Fitzgibbon et al., 2007).

The legislative domain: “the use of coercion to achieve behaviour in a voluntary manner or to threaten with punishment for noncompliance or inappropriate behaviour” (p.25). Andreasen (2006) refers to these regulatory bodies as an “upstream approach” (p.7), which has the potential to impact target populations at risk by demanding individuals’ compliance. This “upstream” perspective has been embraced by a number of scholars in the social marketing arena including Gerald Hastings, who is head of the Institute of Social Marketing, Alan Andreasen, Executive Director of the Social Marketing Institute, Michael Siegel and Lyne Lotenberg, authors of the book “Marketing Public Health:

Strategies to Promote Social Change”, Philip Kotler, and Nancy Lee; they are among the many social marketing experts who support the concept. More is discussed about the upstream application in the following section,

The marketing domain: “attempts to change behaviour by offering reinforcing incentives and/or consequences in an environment that invites voluntary change. The environment is made favourable for appropriate behaviour through the development of choices with comparative advantage (product and service), favourable cost-benefit relationships (pricing), and time and place utility enhancement (channels of distribution). Positive reinforcement is provided when a transaction is completed” (Siegel & Lotenberg, 2007, p.25). However, due to the widespread association of social marketing with social communications, Kotler and Zaltman (1971) caution marketers about the exclusive utilization of social advertising, that fails to address essential marketing elements. They define social marketing as “the design, implementation, and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communication, distribution and marketing research”(Kotler & Zaltman, 1971 p.10). Rothschild (1999) also notes that most behaviour change campaigns make use primarily of education and law while failing to address the marketing aspect of exchange. Siegel & Lotenberg (2007), Bennett & Sargeant (2005) Andreasen (2002) defined several essential marketing concepts and their application in health promotion campaigns. These concepts are: exchange, self-interest, behaviour change, competition and audience and segmentation, the marketing mix-product, price, place and promotion, and last but not least, building relationships.

## **1.9 CONCLUSION**

Healthy eating environments, considered of primary importance in guiding optimal food choices (Sallis & Glanz, 2010). It has been suggested by a number of studies (Wansink, 2004, 2006; Wansink et al., 2004) that aspects of our physical surroundings, like availability of healthy foods, palatability of food and visual presentation are shaping our decisions of what, how much and when to consume. Upstream social marketing, targeting the environment that surrounds the individual and shapes his choice has been regarded as one of the “greatest areas for prevention and treatment actions potential” (OSG, 2001; Andreasen, 2004, 2009; Kahneman, 2010). Therefore, strategies should be focused on multiple levels (Nelson et al., 2009), with a focus on healthy eating environments having exceptional significance in the execution of healthy eating behaviours (Nestle and Woolf, 2008).

# CHAPTER 2 LITERATURE REVIEW

## **OVERVIEW**

This literature review integrates broad themes and provides a framework of the research problems on the subject of healthy eating. It reviews eating behaviours, how they were traditionally studied and the physiological, psychological and environmental powers that influenced them. Illustrated are internal and external factors and their role in influencing our eating behaviours.

Firstly, the literature review concentrates on the background of healthy eating and the effect of everyday food choices to our health and well-being, the economic, social and environmental determinants and factors that have influenced our food choices and how. Reviewed are descriptive studies on dietary intakes, trends and various influences- individual, social, economic, environmental and others.

Theories in behaviour change are mainly discussed with a reference to Ajzen, Fishbein (1980, 2010) and Baranowski (2003) and Koster's (2003, 2004, 2009) work on consumer behaviour prediction. Those models help health professionals understand motives and enhance understanding of behaviours, to tailor programmes specifically targeted at that audience. Providing a multi-layered understanding of consumption behavioural choices improves the chances of creating successful social marketing campaigns, which raise awareness, provide information, build relevance and create credibility. Ajzen and Fishbein's approach to behaviour change defines the regularities of consumer decision-making but it has been highly criticized by Koster and colleagues.

Reviews of health promotion campaigns included were not limited to topics on improving nutrition beliefs – decisions, practices, and outcomes for young adults are also included to provide understanding of the existing status of efforts aimed at bringing eating behaviours up to date. Nutritional status and trends for young adults, the diversity of



factors that have considerable influence on their food choices, the broad and developed food and beverage environment, and policy actions used to improve nutritional status are included. Important and relevant results are distributed throughout the body of the text. A full list of the findings is provided in the final chapter, together with the general conclusions and recommendations.

Also, traditional qualitative methods used to investigate the research problem were studied and their constructive criticisms, providing a guidance for the construction of more reliable methods of inquiry that allow capture of behavioural accounts, their analysis and improved prediction to create even more successful plans for interventions. The literature review provides a framework on how the problem of promoting healthy eating has been approached by researchers. Significant findings from the eating behaviours and the decision making process were found in journals of health psychology, public health, marketing, health psychology, and behavioural economics sciences. Findings from these areas, frequently regarded as distinct, were integrated to produce a comprehensive review of how healthy eating promotion efforts can be further improved in terms of their effectiveness and long-term value to the public.

The external, contextual factors have often been ignored or left unexamined in development of healthy eating communication programmes. The food environment in colleges is a factor of primary importance in the decision-making processes regarding consumption behaviours (Wansink, 2005, 2006). Those seemingly simple food choices and how they occur are discussed below. The enhanced understanding of those environments allows for the creation of healthy eating environments, which can significantly improve and rebuild healthy eating behaviours among populations at risk. Some of the traditional ways of coping with overweight, obesity and healthy eating issues among students eating at colleges are challenged. Those campaigns are commonly called social marketing campaigns that promote behaviours that benefit the individual and the society. In order to be effective, such campaigns usually involve certain behaviours, which usually are very difficult to achieve because modification of the existing behaviour and creating a new behaviour turns out to be a problematic issue both for those promoting

it and those trying to adopt it. Ways in which these can be used to construct and help sustain long-term healthy eating behaviours are demonstrated.

## ***2.1 Utilization Of Behavioural Theories In Social Marketing Initiatives***

Eating behaviours change with age and keep changing and adjusting depending on various social, cultural, environmental and economic factors (Provencher et al., 2009; Young & Nestle, 2002; Birch, 1999). Eating behaviours are complex and influenced by a variety of factors and their interplay (Koster, 2007; Elaine, 1999; Wansink 1996, 2007, 2010; Wansink & Chardon, 2006; Wansink & Sobal, 2007). Various research fields have investigated eating and drinking behaviours and how they occur as choices, however, because of their complexity, development of interdisciplinary approaches to investigating them are necessary (Ibid.). Most research on consumption behaviours has been focused on a single aspect of eating determinants (Koster, 2009).

Behavioural theories are essential since they provide constructs of human decision-making and the variables and factors which provide explanations of human eating behaviours (Baranowski, 2006; Hastings et al., 2000; Andreasen, 2006; Wardle, 2006; Baranowski et al., 1999). Behavioural models provide frameworks in which application is studied in various settings, social situations and specific populations. In this way, behavioural theories evolve and are useful in behaviour change initiatives (Baranowski et al., 1997).

The primary focus of behaviour change theories is the consideration of factors that decisively influence individuals' behaviour (Glanz & Rimer, 2002; Randolph & Viswanath, 2004). Baranowski (2006) suggests that behavioural theories are helpful in that they investigate the mediating variables associated with behavioural decision-making. These can be variables from the environment that actually act as mediators to influence behaviours. Such interventions do not directly influence individuals to change their behaviours; instead they change the variables associated with behaviour change.

These changes in the mediating variables change the individuals' behaviours. The greater the causal relationship between mediating variables of behaviour, the greater the changes in behaviour that will occur. For example, providing a predominantly healthy nutritious lunch offering in a cafeteria makes it much more likely that a greater proportion of people eating there will choose a healthy meal. In contrast, providing few healthy options and having the same amount of high fat and high calorie options would have quite different results. People in both cases had the opportunity to make the choice themselves rather than complying with a healthy eating recommendation of any kind. However, if the effectiveness of the variables is compromised, even the most powerful mediators will not be successful in influencing behaviours. Fishbein and colleagues summarize common themes from most behavioural theories related to the behaviour change concept in social marketing campaigns, noting "one or more of these conditions must be true for a person to perform a given behaviour:

- “1. The person has formed a strong positive intention (or made a commitment) to perform the behaviour.
2. There are no environmental constraints that make it impossible for the behaviour to occur.
3. The person has the skills necessary to perform the behaviour.
4. The person believes the advantages (benefits, anticipated positive outcomes) of performing the behaviour outweigh the disadvantages (costs, anticipated negative outcomes).
5. The person perceives more social pressure to perform the behaviour than to not perform the behaviour.
6. The person perceives that the behaviour is consistent with their self-image and does not violate their personal standards.
7. The person's emotional reaction to performing the behaviour is more positive than negative.
8. The person believes (has confidence) that they can execute the behaviour under a number of different circumstances (i.e., the person has the perceived self-efficacy to execute the behaviour).” (Fishbein et al. 1991)

### **2.1.1 Emphasis on the Behaviour Change Concept**

Behaviour change is an essential ingredient in social marketing campaigns. Kotler and Andreasen (1996) say that, “This is an absolutely crucial point. Some non-profit marketers may think they are in the ‘business’ of changing ideas, but it can legitimately be asked why they should bother if such changes do not lead to action” (p.110). Therefore promotion campaigns that persuade individuals to improve their eating choices require marketing efforts to focus on the behaviour change concept. Educating and relating the information to the individuals’ perceptions of negative and positive consequences of behaviour or other motivational influences are of foremost importance. For that reason, powerful salient motivation techniques and strategies are needed to make individuals take action. However, the essential function of knowledge and positive attitude formation campaigns, and even their successful implementation, are rarely sufficient on their own to persuade individuals to act upon them. In this sense individuals’ voluntary behaviour change has proven to be challenging to influence (Baranowski, 1997; Koster, 2006). Moreover, despite individuals’ positive attitudes towards healthy eating practices and intentions to comply with them, they are still insufficient and not enough to reflect the complexity of variables that seem to influence these seemingly simple behaviours (Siegel and Lotenberg, 2007).

Perceived barriers for behaviour change in social marketing are usually psychological or physiological, like time, pleasure, taste, feeling, effort or a mixture of these. Individuals perceive cost as a barrier to hedonic experiences and even infringement in their personal freedom to choose and/or exercise authority over their volition. Rothschild (1979) feels very strongly about the idea that sometimes the behaviour change we are after is perceived as greater than the monetary costs by consumers (Rothschild (1979) in Siegel & Lotenberg, 2007). Therefore in order to overcome the high-costs associated with the exchange, health practitioners need to perform thorough formative research in order to establish values that are more salient and relate to their target audience. Moreover, these costs can be further reduced through partnerships that can make the behaviour less challenging to perform and maintain. Public and private organizations can be valuable

facilitators of discounting the cost associated with behaviour change; these are described as ‘partners’. Partners usually discount the ‘cost’ by harmonizing environments, adjusting regulations, providing support and making it generally appear discounted. Healthy eating campaigns, despite having existed for a long time, have had limited success. A number of behavioural experts have reached the conclusion that people tend to seek immediate gratification, rather than long-term benefits associated with the desired behaviour (Baranowski et al., 2002; Kahneman, 2003). Therefore, explicitly communicating the immediate benefits associated with the behaviour change as well as the establishment of partnerships should be combined in order to develop efficient social marketing programmes.

Strand, Rothschild and Nevin ((2004) in Siegel and Lotenberg, 2007) observe that “depending upon how environments are constructed, distribution channels can allow marketers to lower an audience’s barriers to access, increase utility, or deliver a bundle of benefits to the target audience”. The ‘place’ in social marketing campaigns is considered as the hardest element to conceptualise, requiring greatest efforts and planning to exercise control over it (Andreasen, 2006). Therefore healthy eating interventions would be considering where these behaviours and decisions occur, and considering possible threats in this same area, and how these can act as hindrances to behaviour change efforts. Profound analysis on behavioural influences suggests that settings and places are primary factors that shape decision-making processes (Wansink, 2004, 2006; Seymour et al., 2004). Therefore, depending on the characteristics of the places, where intended behaviours take place, very different decisions can be made as a result. Social marketers should pay close attention to this component in their strategies. Failing to contemplate the place where the behaviours occur can seriously compromise their efforts (Siegel & Lotenberg, 2007).

### **2.1.2 Challenging Issues within Behavioural Frameworks**

Cultural and environmental contexts shape the routines (Koster, 2009). People’s thoughts, tastes and behaviours are reflected by routines. The way they perform over time is a result of the culture and also the social structures in which they evolve (Koster, 2009;

Elaine, 1999). This is relevant to the way that people take measures concerning food, eating as a whole (Elaine, 1999) and time (Wardle, 1999; Jastran et al., 2009). It is extremely difficult and complex to establish a routine that meets ideals in eating. People need to invest time and attention in order to find the best solution. Having an established eating routine provides you with comfort (Jastran et al., 2009)..

These observations related to unconscious elements in decision-making certainly have implications for health marketers who are increasingly targeting consumer behaviours that require individuals' conscious deliberation. This realization and the implications it brings are, however, opportunities to find ways of improving health programmes by supplementing them with methodologies that are better aligned with the current development in consumer research techniques. Koster (2006) points out that most important findings from physiology and psychology – suggesting that human behaviours are predominantly influenced by intuitive rationalization processes (Shafir & LeBoeuf, 2002) – have not been investigated in areas such as sensory and consumer research. Recent studies in sensory research confirm that role in our everyday consumption decisions (Koster, 2006; Wansink & Sobal, 2007; Wansink, 1996).

That the awareness of eating choices is guided primarily by non-rational decision making processes (Hamlin, 2010; Cusick & William, 2009) means that the use of research methods used in consumer research should be reconsidered. Koster (2006) advocates the use of complex methods that allow the observation of behaviours in their natural environment, making use of “situational analysis, observational methods and memory and expectation research”. A number of behavioural researchers (Ibid, 2006; Meiselman, 1995) argue that these methods have the benefit of analysing behavioural determinants within their natural context rather than isolating individual aspects and analysing them. “Even after decades of research, neither personality nor cognitive factors have been shown to influence behaviour in the absence of situational continuity that is maximally conducive to high correspondence between measures of latent and action variables (e.g. Ajzen, 1985; Foxall, 1983 in Foxall & Bhate 1993, pp. 34-35).

The utilization of behavioural theories in health promotion campaigns has been debated by experts for several reasons. First, behaviour change theories like the Theory of

Planned Behaviour are entirely built on correlational measures (Koster & Mojet, 2007a). The correlational measures predict attitudes and intentions to perform this behaviour (Ajzen, 1991), which is more closely correlated to past behaviours, as pointed out earlier (Wilson, 2002). Moreover environmental and social factors (Wansink, 2004, 2006), habits (Jastran et al., 2009), emotions (Berridge & Winkielman, 2003), and incidental learning significantly determine behaviour. Therefore, the applications of these theories have been widely criticized (Hamlin, 2010; Koster & Mojet, 2007a; Koster, 2009) because of their low predictive value (Koster, 2009) and limited and short-term effectiveness (WHO, 2008).

The deductionists avoid this problem because they pursue a totally different approach. The situational factors have high influence on making your choice of food or drink. In different situations, the same people appreciate one and the same food in a different way. It is of major importance to get away from research concerning sensory consumers, because there the consumer is classified as a unitary person. In an alternative way, a consumer has to be seen as a mixture of personalities who in different situations has different reactions. It will be more useful and effective not to segment people, but to position meaningful eating and drinking situations that consumers ultimately share (Koster, 1996, 2009).

Methodological drawbacks of behavioural theories are the extensive usage of questionnaires, interviews and focus group techniques in consumer research. Techniques extensively relying on consumer accounts should be reconsidered in the future. The methodological drawbacks of theoretically based behavioural research are in that they rely on constructs of attitudes and intentions, rather than more reliable predictors like past behaviour, hedonic preferences, eating routines and other cues from the environment (Koster, 2006). Therefore findings from such studies should be used cautiously, since they do not correspond to actual motives for human decisions (Koster, 2006). Maybe that is why very few of behaviour change initiatives have resulted in actual change in behaviours (Ammerman et al., 2001). Possibly in most cases the interventions did not influence half of the mediating variables on which the investigators designed their

programmes (Baranowski et al., 1997). This inconsistency of the success in behaviour changes and poor productiveness suggests the problems in understanding dietary behaviour and its change are much more complex (Baranowski, 2006).

Buchanan (2004) argues that scientific methods should be reconsidered, as like observational and co-relational research, they are recognised as unreliable and are often used in exploratory stage. Buchanan (2004) argues that in order to really understand behaviours like overeating, a development of a 'humanistic model' is necessary (p. 146). He remarks, however, that developing causal relationships in human behaviours is unrealistic since it does not follow specific patterns, and individuals take very different decisions in similar situations (Koster, 1996). According to Marsh, Hicks, and Hancock ((1998) in Tobias (2009)) one of the most common explanations for intended behaviour executions not being performed is because we deliberately make such decisions. These are often due to unfeasible execution or the presence of more valuable alternatives.

### **2.1.3 The Exchange Concept**

Central to behaviour change initiatives, the concept of exchange requires an individual to realize the benefits of initiating a behaviour, and this realization allows him to make a decision whether to act upon it or not (Kotler, 2000). Moreover, there is a recognized benefit from the exchange, where at least two parties engage, and are able to communicate and deliver the behaviour. Healthy eating messages usually require the exchange of food choices, usually swapping high fat options with low fat ones, or encouraging the consumption of five servings of fruit and vegetables a day or decreasing the consumption of certain food products. In order for the exchange to happen, there should be a conscious analysis of behavioural costs and perceived benefits. Consciously perceived benefits of healthy eating behaviours play a tremendous role in behaviour attitude formation (Baranowski et al., 1997; Ajzen, 1991; Rosenstock, 1974), which has been linked to the motivation and subsequent execution of healthy eating choices (Ogden et al., 2007; Kotler & Lee, 2008). However, some recent findings in behavioural research point out that human behaviours are largely influenced by unconscious decision-making



(Bargh et al., 1999; Damasio, 1996). On the other hand, Koster et al. (2009) maintain that the exchange concept can still work if more enjoyable and simultaneously healthy behaviours are suggested, rather than only providing individuals with knowledge of the benefits or desired behaviours. Implications still exist for behaviours and or habits that have been maintained for extended periods of time like food habits acquired in the early stages of development. On the other hand, to counteract these Tobias (2009) suggests the adoption of various strategies that remind individuals of the execution or not of these particular behaviours.

#### **2.1.4 Habit Modification Strategies**

The traditional justification for people's failure to keep up with desired behaviours, despite believing in their positive outcome and seeing them as socially desirable, is the explanation about existing behaviours and their strengths. No behaviours were actually developed to sustain the new behaviour. Tobias (2009) explains that hindrances for behavioural change are usually existing habits, which should be replaced by creating new sustainable habits which will help us maintain the desired behaviours. He proposes a strategy opposite to the common assumption that habits are hindrances to behaviour change efforts (Koster, 2009; Jastran et al., 2009). On the contrary, he considers them from their facilitative standpoint in planned behaviours. Tobias argues that habits influence behaviour through automatic triggers, affected by situational cues, and are executed, unless consciously controlled, by individuals. The assumption is that habits work by enhancing the recall of repeated behaviour. Consequently, modifying a habit is related to the ability to recall. Therefore, in order for positive habits to become more easily performed by people, and later on become habitual behaviours, reminders should be established. Concluding that initial difficulty to memorise new behaviour can be enhanced by developing reminders. The decline of reminder effect in the long run, however, is compensated for by the development of the new habit (Tobias, 2009).

### **2.1.5 Cue-Based Decision Making**

In recent years, environmental factors such as food availability, perceived effort, hedonic preferences, as well as visual presentation, size of serving dishes, variety of food, social and atmospheric factors such as the number of people eating together, and other variables have been shown to be of great significance when it comes to making a meal choice. Moreover, human decision-making has been guided by a number of unconscious instincts that are difficult for us to control, making adherence to any particular eating plan a challenging task.

Those important findings can be used as a powerful instrument that looks after individuals' health by creating a healthy eating environment where students would be provided with the opportunity to eat nutritious balanced meals that are essential to their best physical wellbeing. The environmental approach to healthy eating programmes does not leave the individual feel deprived of choice or to make a sacrifice in terms of his own self-interest, as most healthy eating programmes do taking the behaviour change approach. Therefore, we are employing the same environmental factors that lead us to overeat but in the opposite direction to create healthy eating environments while keeping the variety of food choices. Findings from behavioural economics show that if desserts were to be purchased separately, rather than being offered à-la-carte, consumption decreases substantially.

Tversky and Kahneman (1973, 1974) were the first to document that people's decisions are positively influenced by availability heuristics because it costs less effort to process. According to health experts (WHO, 2008), behaviour change is of principal importance for improving the long-term quality of life of individuals, society and when coping with global health issues. Tobias (2009) summarises the three most common global approaches to changing individual behaviours. The first principle is to create an environment predisposing the individual to perform the desired behaviours or make it difficult to perform undesired ones. The second is the profound belief of the individual to perform the desired behaviours (Mosler et al., 2001 in Tobias, 2009). The third

significant factor is the social environment (Moss & Wilson, 2010; Levitsky et al., Shepherd, 1999; Bargh & Chartrand, 1999) of the individual. We are social creatures, so we act according to how we are expected to act and according to what is acceptable or desired by the society or the group to which we belong.

Moreover, Wansink claims that “people consume with their eyes not with their stomachs” and that we are much more influenced by external factors like smell, look and taste, rather than internal cues like hunger and thirst. So each time one experiences a food cue in some form, would it be the tempting smell of freshly baked baguettes when you pass by a Subway restaurant or the view of a succulent McDonald’s menu on the bus stop, people make unconscious choices whether to grab it or pass it. This ready availability of highly palatable, but unhealthy foods means that if a person is attempting to eat healthily, he must constantly balance.

In the article De-marketing Obesity, Brian Wansink and Mike Huckabee propose the Drivers of Consumption model where two principles influence the consumption and the acquisition of food: the law of least effort and the nutrition tradeoffs. The first balances between convenience and cost of products. But actually most consumers try to find products with greater convenience at a lower price. The market is the major driver of the food distribution system and the major reason for people with weak will power living in a high fat access environment. “Convenient, easy to open packaging, vending machines, drive-through restaurants, free pizza delivery” (Wansink & Huckabee, 2005, p.3) increases access level to unhealthy food. Another factor is the access to “ready-to-eat food”, which makes the choice for self-preparation quite difficult. The second principle explains how the choice of what to consume is influenced after we evaluate our personal decision between what we should eat and what we want to eat. People experience three major tastes for food: fat, salt and sugar. From these derive a variety of wishes as to what kind of food we want to eat. Our ancestors used to assume that the more salty, sweet and fatty the food is the more likely it is for them to survive. But nowadays the more salty, sweet and fatty, the more unhealthy food is. These two principles have been influencing consumers’ “hunting and gathering tendencies” (ibid, p5) for decades.

Convenience, the 'driver' of obesity, has one guiding principle, the easier it is to obtain, the more of it we would consume. Even increases in prices of unhealthy food do not always motivate choosing healthier options. Therefore, decrease of serving sizes or making the unhealthy foods more difficult to obtain can have profound effects on calorie reduction if implemented in college environments.

The second implication is that the non-negotiable concession on taste can be moderated by changing the ingredients and/or preparation methods while perceived tastes stay the same. The taste of food is important because it depends on whether the food would be liked and consumed, however, it does not influence significantly how much would be eaten, because individuals would eat as much as they would normally. What is important in this principle is that the amount of fat used to cook the food should be replaced with something with lower caloric or/and fat values.

### **2.1.6 The Self-Interest Concept**

Self-interest is a driving force of every human individual. The objectives of social marketers differ from their commercial counterparts, in that they aspire to produce a need rather than to find such in the target audience. The reason is that audiences' present demand is rather opposed to the one that is pursued by social marketers. Therefore, social marketing's task is significantly more complex. Also, more often than not, individuals are persuaded not to perform behaviours that bring them some kind of utility, satisfaction or pleasure (Wallis & Hetherington, 2009; Rozin et al., 2006). As Rotshchild (1999) describes in healthy eating campaigns, people are actually discouraged to consume food that they find attractive and/or for which they have developed a liking. This makes the effective demonstration of benefits associated with health behaviours more complex because it requires that individuals give up desired behaviours. Rotshchild reaffirms that by stating "People choose to eat junk food, not exercise, smoke and drink to excess... because they have evaluated their own situation and environment and made a self-interested decision to behave as they do." (Rotshchild, 1999, p.26). "Therefore, the marketing process aiming to change eating habits extensively should employ formative research to learn about the audiences' current eating habits, and explore the attitudes

towards the costs and benefits associated with performing the healthy eating behaviours. After performing formative research, a social marketing campaign could be developed to meet the target population's characteristics found through the formative research, and is ready for execution" (Siegel & Lotenberg, 2007, p.25). Still, marketers have difficulty in portraying the explicit benefits of behaviour change in social marketing initiatives to the individual (Grier & Bryant, 2005). One commonly adopted strategy to promote healthy eating behaviours is through the use of communicating the long-term benefits associated with the behaviour. However, despite everyone's desire to be healthy, there are more salient needs that every individual holds (Siegel & Lotenberg, 2007). A number of explanations have suggested that public health messages do not work because the messages in them sell health, which is not a primary salient value to most individuals. Therefore health sold as a product is not appealing to individuals. Fawcett (2000) found that for adolescents healthy eating messages even create some form of rebellious behaviours, opposite to the health messages. What is more, most people are aware of the difference between healthy and unhealthy behaviours. However, they deliberately choose to perform the unhealthy behaviours that they feel have a stronger value for them. For example, smoking, widely recognized for its deleterious effects on individuals' health, appeals to firmly held values on individuality, freedom and rebellion (Siegel & Lotenberg, 2007).

Therefore, scholars advise that social marketers should provide immediate benefits so that individuals would perceive them as more attractive (Sustein & Thaler, 2008; Rothschild (1999). As Rothschild (1999) states: "In most situations, people act primarily out of self-interest", however, in public health and social marketing campaigns individuals are asked to perform behaviours that are opposite to their self-interest. For example the obesity prevention campaign VERB had adopted a rather different approach to conventional public health campaigns and has been very successful in motivating young people into adopting new healthy behaviours (Huhman et al., 2005). VERB, rather than using prevention messages, has marketed physical activity as *socially desirable behaviour*. Therefore, portraying healthy eating behaviours as socially desirable and trendy would create a better image for people undertaking them, increasing the success of

healthy eating campaigns.

### **2.1.7 Nutrition Knowledge**

People are preoccupied with various tasks, responsibilities, and are not really paying attention to food labels. Nevertheless, understanding of nutritional principles is a powerful tool in customers' hands, and the choices educated consumers make are considerably mindful (Gedrich, 2003; Kreuter et al., 1997, Ogden et al., 2007 ). However, if the consumers are not that interested in reading nutritional labels, the benefits of consuming certain foods can be made more visible if they are explicitly communicated, although this is still not a guarantee for success.

### **2.1.8 Competition**

When considering behaviour change initiatives, we should take into account various competitive forces. The primary purpose when considering those should be to overcome them by putting forward more advantageous benefits that appeal meaningfully to individuals. The greatest competitors are usually current behaviours individuals already hold or others that seem attractive to engage with. Siegel and Lotenberg (2007) caution about presently maintained behaviours, that people usually have significant reasons for conducting behavioural practices because they already hold great value for them. Behaviours that have been maintained for a long time or for extended periods of time could be much more difficult to outweigh. In these cases, individuals have developed habits that are significantly challenging to influence. Siegel and Lotenberg continue to describe the competitors' forms. "When the desired behaviour is supporting a public health program or policy, the competition may have to do with resources (other funding needs are more of a priority to the policy maker), philosophy (such as a belief that there are too many government programs already or that government should not intervene in personal decisions), or pressure from interests that are not related to health (i.e., businesses saying increased regulations to safeguard the public's health would be "bad for business"). Sometimes it is necessary to restructure the public health offering in order to overcome problems related to competition". (Ibid, p.212)

What is more, research shows that competition of healthy eating behaviours comes from various perspectives and in various forms. These threats can be environments (Popkin et al, 2005; Roefs et al., 2006; Jaime & Lock, 2009), social situations (Bandura, 1986; de Castro, 1990; Devine, 2005; Pliner & Saunders, 2008) where the behaviour takes place (Devine, 2005), economics (Blaylock, 1999; Nestle, 2007), time constraints (Devine, 2005), visual cues (Wansink, 1999, 2006), availability, behavioural control, knowledge (Wardle et al., 2000; Kreuter et al., 1997; Misra, 2007) and even individuals' mood (Rolls, 2005; Wallis & Hetherington, 2009; Winkielman & Berridge, 2004) can be put in this category. The implications for healthy eating communication campaigns are in terms of sources of conflicting information, the private industry's marketing efforts to promote products employing powerful persuasion techniques, and even the provision of misleading information or its complete absence (Kotler & Lee, 2008). Those aspects will be described in detail in the following sections.

### **2.1.9 Audience Orientation and Segmentation**

Segmentation in social marketing interventions is of great importance for several reasons. The successful targeting and application of the campaign depends on reaching the target audience (Hastings, 2007). The second major component of behaviour change communication campaigns is the engagement strategy. In order to influence the target audience, the marketer's primary objective is to learn about characteristics that describe them and motives for their behavioural patterns. These essential attributes are studied in detail in order to determine hypothetical situations when individuals make decisions on whether or not to perform specific behaviours. Marketers extensively employ formative research techniques to learn about the customers' salient values as well as other functional benefits associated with the behaviour change initiative. In this way, marketers can develop messages that would be highly relevant to the individuals whose behaviour needs to be modified (Fitzgibbon et al., 2007). Hence, more effective approaches and conceptual models are necessary to create and maintain societal changes. Advanced understanding of the different levels of society is needed in order for social

communication to be effective (Hawke, 2006). This understanding is usually facilitated by performing thorough formative research into the target audience where the behaviour change initiative is to be implemented (Kotler & Lee, 2008).

## **2.2 Marketing Healthy Eating**

Fighting with the obesity epidemic has turned out to be a daunting experience so far for both public health practitioners and the population trying to improve their lifestyles. Healthy eating campaigns aim to modify and improve human diet, and to create long-term wellbeing for the whole population. However, despite everyone's desire to be healthy, every individual has more salient needs (Siegel & Lotenberg, 2007). One specific implication of healthy eating communication initiatives is that they do not provide strict guidelines upon which they advise the public to act. These recommendations are rather broad such as "Base your meals on starchy foods", "Eat lots of fruit and vegetables" or "Cut down on saturated fat and sugar" (FSA, 2010). These recommendations are not specific enough and there is no single way of executing them (See Appendix: Dietary Recommendations). Different people have different interpretations of these same recommendations (Wardle, 2000), therefore, education initiatives are crucial components in social marketing campaigns. Moreover, studies confirm that better educated people make healthier food choices (*Wardle et al., 2004*).

According to social marketing specialists (Siegel & Lotenberg, 2007; Rotshchild, 1999), public health campaigns fail to fulfil one major step in behaviour motivation. This is to appeal to the most salient values and needs of individuals, i.e. freedom, independence, control and rebellion. Therefore, health sold as a product is not appealing to individuals. They propose that health behaviours should be reframed in aspects different to promising long-term health only. Fawcett (2000) found that for adolescents healthy eating messages even create some form of rebellious behaviours, opposite to the health messages. What is more, most people are aware of the difference between healthy and unhealthy behaviours. However, they deliberately choose to perform the unhealthy behaviours that they feel



have a stronger value for them. Therefore, health behaviours should be ‘repackaged’ to appeal to people’s higher values.

Social marketers often work in partnership with organizations from the public and private sectors, facilitating significantly the social marketers’ efforts (Andreasen, 2006). These are organizations, individuals or group leaders that align with social causes and facilitate objectives and processes set by marketers. They can accommodate programme efforts in all stages, from formative research to planning, pre-testing, implementation, evaluation and review of campaigns. Partners can also provide support with know-how, gaining access and finance. Social causes, having received scientific and/or expert approval, gain significantly higher chances in establishing such partnerships with various public and private organizations. These mainly assist the social marketers in “promoting the behaviour and if necessary, in developing technological, educational and policy changes to facilitate such behaviour change.” (Siegel & Lotenberg, 2007, p.222). Andreasen (2006) points out the importance of finding such partners that are not dependent. They can provide a reliable source of data, assessment and providing unbiased opinions on implementation and solution methods.

Additionally, partnerships with popular and respected people who are capable of raising awareness and to portray their positive image to an issue, foundation leaders that are willing to support initial experimental interventions, or strengthening the public and policy makers’ attention to a problem. These people can reach a large number of supporters and are well admired by the public. There are a number of non-profit organizations that join efforts with communities to solve problems. The Food Trust, is a not-for-profit organization working on a variety of nutrition-related programmes with the aim of making healthy and nutritious food accessible to people. The Food Trust reports by “working with neighbourhoods, schools, grocers, farmers and policymakers, we’ve developed a comprehensive approach that combines nutrition education and greater availability of affordable, healthy food” (The Food Trust, 2004). “The Food Trust is transforming the food landscape one community at a time, by helping families make healthy choices and providing access to affordable and nutritious food we all deserve.”

(The Robert Wood Johnson Foundation, Ibid.) Another notable example is the not-for-profit organization the Soil Association, whose efforts are aimed at bringing awareness, and ultimately changed for better, ultimately improving health and nutrition of people. They place great value on sustainable and healthy food production, and fair treatment of nature and animals. Their aims have grown bigger, and their objective presently is for the “United Kingdom to be 100% organic by 2050”. To try to achieve this, they work with communities and by lobbying groups operating at all governmental levels. Food for Life, their educational co-project, is directed at providing sustainably sourced food freshly cooked, as well as getting pupils close to where this food comes from, and encouraging them to prepare and grow the food on their own.

Jamie Oliver is a bright example of gaining the public and media’s attention to the unhealthy school meals served in the United Kingdom and recently in the United States. Despite his approach being criticised, following his campaign, the government introduced new regulations on meals served in schools in the United Kingdom. By December, 2010, Jamie Oliver had gathered 1 million signatures to support his campaign “Platform for Change” bring those to Washington DC. Jamie Oliver is also gathering celebrity endorsement in the United States; so far he has received the support of show business celebrities like rapper P. Diddy, actress Jennifer Aniston, singer and actress Jennifer Lopes, model Heidi Klum (Jamie Oliver, 2010). Media figures, like journalists, authors, editors, and documentary filmmakers are also highly effective in gaining the public’s attention on a social issue and thus receiving the public’s support. There are number of social issues that have used such partners very successfully: Food Inc directed by Robert Kenner, and Super Size Me by Morgan Spurlock. Jamie Oliver’s strategy in overcoming the public’s initial opposition to his schools food initiative in the United States was significantly improved after he appeared on the TV shows of Larry King, Oprah Winfrey and Ellen Degeneres and received their support for his cause.

Government legislators get involved, normally, when an issue has gained considerable attention and requires treatment. Such involvement is usually through provision of general guidelines for strategy and implementation. The establishment of such

partnerships can significantly facilitate the social marketers' efforts by accommodating changes in environments and legislation, leading to behaviour change initiatives requiring significantly less personal effort by making the individuals' comply with set standards. After the topic of childhood obesity had been discussed in the media and Jamie Oliver's efforts to improve food served in schools, governmental legislation changes are now a fact (FSA, 2009).

Social marketer's efforts are facilitated through working in partnership with organizations that accommodate their promotional needs. Simon Broadbend and Leo Burnett (1989), however, caution that "Advertising is like engines; while the engines are running, everything is fine, but when the engines stop, the descent starts. Therefore, the reminder effect of advertising has also been suggested to be essential since new behaviours that social marketing marketers promote are not yet well remembered and require time and reminders before becoming habits, or simply because people forget (McKenzie-Mohr & Smith, in Kotler and Lee, 2008, p. 64).

### **2.2.1 Branding Incorporated**

A number of scholars have recognised the power of branding in public health campaigns (Lowry, 2009; Evans & Hastings, 2008; Siegel & Lotenberg, 2007; Asbury et al., 2008). Together, they have reached the conclusion that branding messages support their efforts to persuade people. The most notable success stories have been reported in the fields of healthy eating promotion, anti-tobacco campaigns and AIDS/HIV (Evans et al., 2008). Therefore branding was separated as a sub-topic on its own because of the considerable attention it has received from a number of scholars recently (Lefebvre, 2007; Siegel & Lotenberg, 2007; Asbury et al., 2008) in social marketing and published review articles on successful implementations of branding principles to social problems in relation to public health. They have built a strong case to support the application of branding mechanisms to societal interests.

Recently not-for-profit organizations and government started using branding strategies when trying to influence attitudes and behaviours via public health campaigns. Such application of branding principles was described by Asbury et al. (2008) in the development and application of a branding strategy when creating a public health campaign. An example of such a campaign is creating the VERB brand, which promotes physical activity among children between 9 and 13 years of age. Building the successful VERB brand took a lot of time, effort and cost. First of all, extensive formative research was performed to understand the target audience. Based on the research findings, a brand identity and attributes were created in a way that would appeal to the target audience. Furthermore, a lot of research, expert advice and lessons learned from branding sciences were invested in building and protecting the brand's value or equity with its audience. Part of the success of this campaign was dependent on how well the product (physical activity) was branded and positioned in the minds of teens. The success of this campaign utilizing branding principles shows that a commonly used commercial marketing strategy can be applied when addressing critical public health issues (Asbury et al., 2008).

Communication in 'branding' needs to reach the target market by establishing suitable message channels that will reach the target audience. The message content, the chosen image and the positioning are all essential functions of branding efforts (Arnold, 1994; Ries & Trout, 2002). As Ries and Trout (2002) state, positioning in the mind of the public creates interest rather than advertising alone. The concept of communication incorporates several fragments: the message content, distribution channels, and communication material that will successfully reach the target audience. Addressing the distribution channels of the message distribution is essential for its successful delivery to the target audiences. Designing communication strategies that are relevant to the target audience, by choosing the right message, to reach the right people, at the right place, through the right delivery method are all essential elements for the successful transmission of social marketing messages (Fitzgibbon et al., 2007). Fitzgibbon and colleagues provide some guidelines from communication science that social marketers should consider in planning the 'promotion'. They have pointed out the importance of considering various communication theories. These would include various behavioural theories, message effect and media production theories, in addition to the latest

developments in social and commercial marketing. Like Kotler and Lee (2008), Fitzgibbon raises the issue of the importance of market segmentation and targeting. Not surprisingly, branding comes as highly recommended to consider in social promotion, proving to be highly beneficial (Huhman & Heitzler et al., 2004). The importance of multilevel interventions through partnerships has been also pointed out as a major guidance. The role of research throughout every step of the process is essential for successful planning implementation and evaluation. Message content in the development of any promotion strategy is an extremely critical component. It should be distinctive and relevant to the target audience. The implication for messages that are intended to be communicated to the audience is that their mind would “accept only that new information which matches its current state of mind, it filters out everything else.” (p.33) Therefore, branding has been developing as an all round approach, rather than solely communication or advertising.

Moreover, Arnold (1994) claims that advertising is slowly losing its past dominance over branding. With the maturation of branding, more and more marketers will be equipped with advanced motivation and persuasion techniques and their correct use. This knowledge will come from various sciences, psychology, sociology, economics and other disciplines. Arnold (1994) defines branding as the way customers perceive and make decisions to purchase promoted items. It should be pointed out that despite the customer needs that the product or service meets, which are usually functional and vital for understanding the critical success factors facing a company, brand differentiation is often driven by positioning to meet the consumer’s (usually intangible) wants. In particular, the customers’ intangible or emotional wants are the source of loyalty to a brand. Commercial marketers typically position their functional products supplemented by intangible benefits (Arnold, 1994). Maas, Roman and Nisenholtz (2003) maintain that “people don’t buy products, they buy expectations of benefits” (p. 20), which are not simply the functional attributes to a product or service. Charles Revlon, cosmetics industry executive, said, “In the factories we make cosmetics, in the stores we sell hope” (as cited in Arnold, 1994, p. 20). The starting point in brand management is essentially customer centred.

Therefore, understanding the fundamental motives that drive customers' purchases is the utmost priority.

It is important to note that when implementing a public health branding strategy, there is no tangible product to market. As a result, it is essential that social marketers come up with innovative ways to bring their product (in the case of a public health campaign, a change in lifestyle) into direct contact with the target audience. Last but not least, managers should make a multi-year commitment when developing a truly effective branding strategy for a public health campaign. The research illustrated that social marketing interventions of different types can be effective and that they can work with different target groups: young people, adults, minority ethnic and disadvantaged groups. Furthermore, the results demonstrated that social marketing interventions can be effective in a range of different settings: schools, the workplace, church, community- and family-based settings, clinical practices, supermarkets and media-based settings, amongst others. The reviews also produced evidence that both narrow and broad focus social marketing interventions can be effective.

### ***2.3 Upstream Social Marketing***

The common perception is that social marketing frameworks used in behavioural change initiatives are entirely dependent on individuals' voluntary initiation; these have been referred to as "downstream" initiatives in social marketing campaigns. The "upstream" initiatives also involve behaviour change, however, the individual does not initiate the behaviour as optional, rather the individual complies with certain regulations or other external control variables imposed by higher authorities or the environment (Andreasen, 2006). Additionally, this type of behaviour change is far more influential and has the potential to reach a greater number of people with considerably less effort (Sunstein & Thaler, 2008; Woodman, 2008; Wansink & Sobal, 2007; Drewnowski & Rolls, 2005). In regard to this approach, Andreasen maintains a strong belief that the adoption of 'downstream focus' could impose various limitations to the wider opportunities that the

‘upstream focused’ social marketing interventions offer (Andreasen, 2006). Wallack and Dorfman (2007) also come to the conclusion that social marketers have to focus on the upstream objectives by addressing the structures and processes that lead to the inception of the problems. This broader role of social marketing has been widely supported by other scholars (Kotler & Andreasen, 1996; Rotshchild, 1999; Hastings, 2007; Andreasen, 2006; Wallack & Dorfman, 2002). Therefore the present concern is to develop initiatives targeting “upstream” interventions. Targeting and reaching out various regulatory bodies, community and business leaders, media and other influential parties can lead to further progress of social programmes. Andreasen (2006) calls for major changes in the public domain, development of close partnerships between public and private sectors and institutionalisation of long-term programmes.

Environmental and contextual factors have been shown to greatly influence our consumption behaviours (Wansink, 1996, 2004, Wansink & Chardon, 2006, Hill et al., 2005, Lowe et al., 2009). Therefore, an upstream approach to social marketing has naturally been highly recognised as an effective means of behaviour change, at large due to its umbrella effect. In contrast to the widely applied approaches to promote healthy eating lifestyle changes through behaviour change, also called “downstream focus”, which have had mainly temporary affects as well as high implementation and individuals’ volition costs, the investigation concentrates on the “upstream” approach of social marketing (Andreasen, 2006). The essential role of the upstream objective of social marketing consists of its influence over the various factors that influence the desired positive social changes. Among these are public policy, built environments and business practices (Kotler and Lee, 2008; Hastings, 2007; Siegel and Lotenberg, 2007). The additional forces these organizations and/or regulations offer is a downstream influence over individual behaviours, eliminating the need for personal behaviour change (Kotler and Lee, 2008; Hastings, 2007). Therefore, the environmental, policy and economic changes by which individuals are surrounded have been regarded as critical for the promotion, practice and permanent maintenance of positive behaviours.

## **2.4 Environmental interventions targeting improving the overall eating behaviour of students**

A number of reviews of interventions in school environments have concluded that there is a potential for implementing healthy eating initiatives (Woodman et al., 2008; Hider, 2001). One of the interventions Hider looked at was Pathways (Snyder et al., 1999), developed with five components of implementation: establishment of nutritional guidelines for recipes, guidelines for food preparation, written materials and training for staff, as well as check ups in the form of visits by nutritionists. The nutritional guidelines aimed to meet the recommendations of the US Dietary Guidelines and lower the fat content in meals to 30% of calories. The results were considerable: an average decrease of 79 kcal for the breakfast menu in the three schools where the intervention took place. The average decrease in lunch intakes was 94.76 kCal. Pathways' manipulation strategy was effective and can be considered as a primer of interventions that revamp the nutritional characteristics of foods by educating kitchen staff. These interventions are fully applicable in Durham University's context and may well have profound effect if successfully put into practice. Similar results have been observed by Whitaker et al. (1993), Snyder et al. (1992) and Dwyer et al. (1996), large-scale interventions that mainly modified meal recipes and preparation methods. All resulted in significant reductions, respectively 103 calories, 6% fat, and 6% fat.

However, other interventions which have utilised nutritional information as a main method to improve food choices have resulted opposite to intervention objectives and increased calorie intakes (Aaron, 1995). Among the number of drawbacks this intervention had non-natural occurring behaviours in this particular environment for the participants in the study; also, participants were recruited by newspaper adverts and were paid for participating. Moreover, Aaron and colleagues blamed the limitations of the nutritional labelling and low motivation of participants to eat healthily. These seem very similar to the phenomenon of Durham University's students, who are generally not interested in engaging in healthy eating practices and are not utilizing the provided nutritional information, which as in the Aaron's study is inconsistent.



Another study (Meiselman et al., 1994) employed a single change in the environment. Confectionery foods were moved from the main counter to another one, 20 meters away. Results were profound in terms of confectionery sales (from 14% to 2% of total sales), however, no significant changes/decrease in nutrient intakes was observed. A limitation of the study was that it relied on self-report dietary intakes and students were paid.

## **2.5 CONCLUSION**

The research objective links the literature on theories of behaviour change to that of external and situational factors that influence behaviours, and argues that the latter are better tools for influencing/controlling healthy eating behaviours. Social marketing campaigns that target unhealthy eating have increased in number in the last 10 years. Those campaigns usually aim to explain healthy eating principles by drawing attention to the benefits in the long run, aiming to persuade people to act upon recommended health behaviours, providing information about recommended calorie consumption, proportion of nutrients, recommended daily intake of fruit and vegetables. However, as explained earlier, knowledge is not sufficient motivator for behaviour change, therefore, social marketers frame customer orientation as critical, exchange theory as fundamental and marketing research employed throughout the process (Kotler & Lee, 2008).

Influencing behaviours is quite a complex topic, which requires consideration of complex relationships within individuals and the environments where the behaviour occurs, requiring the integration of various educational, motivational techniques, as well as customisation of intervention mechanisms. Success prospects of health intervention programmes significantly increase through the establishment of strategic partnerships and changes in the individuals' environment. A central role has been placed on those aspects in order to provide the framework or an initial step in the creation of a healthy eating environment that addresses the prevailing unhealthy eating practices among students at Durham University. In order for a social marketing campaign to be effective and confront threats to public health, there should be three fundamental pursuits in public health-change of individual lifestyle and improved environment through social and economic

conditions and reforms in policies (Siegel & Lotenberg, 2007).

In essence, it is argued that external control factors applied in a combination with motivation techniques to have a greater effectiveness in creating healthy eating environments. In this way, populations at risk, with no previous nutrition education, can benefit most from the creation of such environments. This general empowerment that results from the combination of the social marketing framework and its implementations, referred to previously as ‘upstream’ and ‘downstream’, enables social programmes to influence individuals directly, and/or by influencing the environments at large, and sometimes making it seem less effortful for the public (Thaler & Sunstein, 2008; Wansink, 2004; Wallack & Dorfman 1996, 2007; Drewnowski & Rolls, 2005).

# Chapter 3 METHODOLOGY

## **Overview**

This chapter starts with an introduction to the research situation and context. Then the aim of the study is presented, the rationale for the adopted methodology, the design guiding the research process and the adopted instruments to investigate the research questions. The specific procedures undertaken throughout the research process are described. These were employed to ensure the comprehensive understanding of the research questions and their systematic description. Then the issues of validity and reliability as described as well as procedures utilized to validate findings and improve the accuracy of their interpretation.

Section 3.1 describes the areas of enquiry and the applications of the study. Broadly defined, the research questions could be summarised as: understanding Durham University students' attitudes to healthy eating, their established routines and habits when eating in college, perceived difficulties to eat healthily, as well as their opinions on the healthiness of the meals provided by the college.

Section 3.2 explains the rationale for the adopted methodology. Building upon the literature review and the background information described in Chapters 1 and 2, this chapter discusses the rationale for adopting the research instruments and the exact processes undertaken to further improve the accuracy of results. The specific methodological procedures adopted to investigate the issues and research design are discussed in section 3.3. In section 3.4, methods employed in the study. 3.5 discusses , instrumentation procedures, recruitment, sampling method and, in Section 3.6 measurement instrument and Data Analysis procedures In.3.7 Benefits of the Adopted Research Section 3.8 deals with the Limitations of the Present Research the methods and the specific procedures that were implemented to ensure the reliability and validity of any findings, as well as the verification processes.

### **3.1. Research Questions**

The purpose of the present study is to explore and describe students' eating behaviours in Durham University's colleges with the aim to promote healthy eating among the student population. The exploratory objective in social marketing assists in the determination of purpose and focus in the research problem (Kotler & Lee, 2008). This happened through preliminary observations along with interviews with the catering manager and the executive chef of the university, conducted prior to the investigation. This helped to narrow down the research questions to several distinct categories of enquiry, which were studied separately and in combination.

The questions of enquiry explored the perceived problems students experience in eating healthily at Durham University colleges. This question was important for providing valuable insights into problematic issues and the aim was to improve students' dining experiences in college. An extension of the question was developed to share their thoughts about further improvements of the catering strategy so that it would allow and support them in making healthier choices. In addition, their opinions of the meals provided by college catering facilities, in terms of healthiness, variety and choice, were addressed.

Second, an important aspect of the present study was to explore the various factors influencing students' decisions and attitudes towards healthy eating. These included variable in the food environment of students and ways these variables can be influenced for the better facilitation of healthful choices for students.

The third objective was to learn about students' understanding of healthy eating principles, knowledge of their personal dietary needs, familiarity with the nutritional composition of meals and calorie estimation were examined. For example, it was interesting to learn to what extent students were familiar with healthy eating principles. In addition, students were surveyed on the usefulness of nutrition labelling when making dietary choices. The healthiness of each individual student's diet and knowledge was

measured in terms of the established dietary guidelines and the five-a-day recommended portions of fruit and vegetables.

The fourth objective of this study was to explore the need for healthy eating education on campus. It explored whether students would be interested in using software that would facilitate creation of their daily and/or weekly meal plans in order to meet their nutritional requirements.

### **3.2 Methodology**

The perspective that guides the present research project has been characterized as phenomenological, the second major theoretical perspective (Taylor & Bogdan, 1998), since it intends to understand the social phenomena from the participant's perspective and study how they (students) experience the researched phenomena (healthy eating behaviours). Also, grounded theory guided the research throughout (Glaser and Strauss, 1967; Strauss & Corbin, 1990). Since phenomenology makes use of qualitative research methods, these were employed as the basis of the methodology, which seeks understanding of the healthy eating behaviours of the student population at Durham University, coupled with the purpose of understanding several underlying questions associated with healthy eating behaviours. Qualitative approaches using interview and/or focus group discussions have been shown to provide the sort of 'experiential understanding' that the study aims to achieve.

The mixture of methodologies allowed the thorough investigation of the research questions. Theory and practice inform each other in a mutually shaping manner, and neither precedes nor follows the other in a consistent, one-way manner (Denzin and Lincoln, 2003). This approach is also advocated by Hastings (2007) who encourages social marketers to study conclusions derived from literature advocating the notion that there is objective reality, while also recognizing that the adoption of inductive reasoning methods reveals deeper meanings for specific situations. Social marketers are primarily interested in testing an intervention, which pushes towards a positivist research approach and makes use of experimental designs to test hypotheses (Hastings, 2007). Therefore,

the study was complemented by a combination of inductive and deductive reasoning (Stanford Encyclopaedia of Philosophy, 2010). Verification of derived conclusions from literature review and qualitative methods was tested through the use of empirical methods (Denzin and Lincoln, 2005) use of available data and qualitative studies.

Qualitative methods have been adopted as primary research tools. The purpose of the qualitative investigation was to provide an all-round perspective of students' experiences when eating in catered colleges. Students' attitudes, beliefs and values that underlie healthy eating behaviours are an unexplored area of enquiry. Therefore, it was essential that a comprehensive study of the population be conducted with the specific aim of creating a healthy eating campaign. The adoption of qualitative methods allowed the capture of students' experiences through their personal interpretation (Taylor and Bogdan, 1998). Empirical methods were considered suitable to study in depth the research problems through the participants' points of view (Denzin and Lincoln, 2005); also, to explore and evaluate catering environments, and to assess catering strategy processes. Qualitative research instruments, such as participant and field observation, in-depth and semi-structured group interviews as well as available data, were employed throughout the investigation.

### **3.2.1 Rationale for Choosing the Research Methods**

Literature review (Chapter 2) was performed to explore the topic, relevant studies and how these were studied, and to review literature on social marketing campaigns, frameworks and strategies (Hastings, 2007; Kotler & Lee, 2008; Andreasen, 2006; Fitzgibbon et al., 2007; Rothschild, 1999). Literature review further assisted in the development of the research purpose, research questions, identification of potential solutions and development of the research strategy (Siegel & Lotenberg, 2007).

The literature review provided guidelines for conducting the formative research considered as a first and imperative step in creating social marketing programmes (Andreasen, 2006). Often referred to as "fanatically audience centred" (p.97) research, understanding the consumer is of imperative importance for social marketers, therefore

qualitative methods are the optimal means by which such information can be obtained, usually through traditional marketing research methods, focus groups and ethnographic and other qualitative research methods (Siegel & Lotenberg, 2007).

The social science literature review provided models of approaches to investigate eating behaviours, as well as their efficiency and execution specifics. Those included descriptive studies on eating behaviours, surveys on nutrition behaviours and social marketing campaigns, observational, intervention studies and literature syntheses. An important deduction made from the literature was that investigating eating behaviours and creating implementation strategies requires a complex and multidimensional research strategy. Various factors, on different levels, shape and influence them concurrently at any one time. Therefore, in order for these to be studied, a mixture of qualitative methods was adopted to investigate the research questions in order to suggest a rounded and multidimensional view of the problem.

### **3.2.2 Secondary Data**

Publicly available documents, regarded as an important data source (Singleton and Straits, 1999), have been used as supplementary information in the research process. These available data were quantitative surveys performed by an independent company – Russell Partnership – as part of an evaluation procedure. The first survey was performed by Russell Partnership in 2007, with the main purpose to explore perceived problematic areas of Durham University’s catering mainly among the student population living on campus. This quantitative study assisted in the development of the research question, identifying possible problematic issues, the background situation and reviewed recommendations for improvement of the catering strategy of Durham University.

The second quantitative study (December 2009, published early 2010) aimed to evaluate students’ satisfaction with the new improved catering strategy once the new menus were introduced in September 2009. The survey was prepared and executed by Durham University. Students filled out the survey online. This survey aimed to obtain feedback on

the improvements and changes in the menu offering as well as the introduction of nutritional information through the traffic light system. There were a number of open-ended questions where students freely expressed their opinions. Findings from the survey were analysed to confirm findings with descriptive purpose, accounts from interviews, focus groups, and field observation were cross-checked with the quantitative data. Moreover, secondary analysis aimed to increase the sample size, therefore increasing the validity of qualitative enquiries (Singleton & Straits, 1999; Silverman, 2006; Creswell, 1998).

### **3.2.3 Observation**

Observation as a research method has been accepted as the “fundamental base of all research methods in the social and behavioural sciences.” (Adler and Adler, 1994, p.398 in Denzin and Lincoln, 2005). Adler and Adler also say that observation, as a research method, would be “the most powerful tool for validation” in the future (Adler and Adler, 1994, p.389 in Denzin and Lincoln, 2005). Therefore observation was adopted in the exploratory phase of the qualitative research, in the descriptive one and in the development of questions included in the semi-structured interviews (Silverman, 2001).

### **3.2.4 Interviews**

Interviewing is still the most powerful and common way of acquiring information through which individuals are being understood. Despite being recognised as non-neutral means of collecting information, rather as “active interactions between two (or more) people leading to negotiated, contextually based results” (Denzin & Lincoln, 2005, p. 698). Interviews are still being used as primary tool of acquiring information for qualitative and quantitative marketing research studies.



### **3.2.5 Focus Groups**

Focus groups were successfully used in exploring health issues with young people (Robertson, 2003; Watson et al., 2003; Stanton et al., 2000) and widely used as a primary marketing research tool (Krueger, 1988; Denzin and Lincoln, 2005). Because of their capability to provide attitudinal and experiential information (Krueger, 1988), focus groups have been used to diagnose potential problems and to stimulate ideas to solve a problem (Stewart & Shamdasani, 1990). Threlfall (1999) recommends that focus groups, used in exploratory research to assess attitudes, would be most successful when used with a triangulation method of data collection, paired with observation and in-depth interviews. Small group interviews (Glesne & Peshkin, 1992; Krueger, 1988) were adopted in the investigation because participants had a lot to share on the topic “food on campus”. Moreover, the mini-group interviews were somewhat more manageable when semi-structured enquiries were incorporated.

### **3.2.6 Experimentation**

Experimental design was adopted to cross-check (Creswell, 2003; Bryman, 2008) findings from the qualitative investigation of students’ eating behaviours related to their eating intentions and actual behaviour, which produced more reliable conclusions (Bryman, 2008). Experiments are employed in the pre-testing phase of social marketing research when decision-making processes are about to be undertaken (Hastings, 2007). “Pragmatism and precision” (p.184), in line with the positivist approach, Hasting claims are the focus of social marketing interventions. Aiming to test interventions in order to determine their effectiveness, experiments in social marketing allow the investigator to show and receive feedback on visual materials and investigate reactions of target populations (Hastings, 2007). This allows the social marketers to receive evaluation early in the planning process and make alterations.

### **3.3 Research Design**

A flexible research design was adopted in the preliminary phase of the study, with vaguely formulated questions (Taylor & Bogdan, 1998), which were later developed and adapted to fit the investigated subject matter, the research context, participants' interests, and the researcher's shifting research interest (Denzin & Lincoln, 2005; Strauss & Corbin, 1998).

The combination of qualitative and quantitative research has been designed in order to "locate the results in a broader context" (Silverman, 2006; p.48) of Durham University's student population. Moreover, combining data from quantitative survey of Durham students 2009/2010 and 2007 was used to investigate the background circumstances to the qualitative findings (Silverman, 2006).

The study incorporates qualitative methods of enquiry (one-on-one interviews, focus group interviews, observations, and two ouasi-experiments), previously adopted methods used in the investigation of people's dietary choices through semi-structured interviews (Lupton, 1996 in Bryman, 2008), focus groups (Beardworth & Keil (1992) in Bryman (2008)) at a single time, including qualitative review of documents and an experimental design.

#### **3.3.1. Exploratory phase**

This phase of the research aimed to analyse the situation and learn about the student population. Unstructured observations, focus groups and interviews were conducted in the early phase of the research agenda, preceding more rigorous investigation procedures (focus groups and quasi-experiments) in order for the researcher to be familiarised with the context and participants (Singleton & Straits, 1999). Field observations facilitated the preparation for a more intensive development of the research agenda, the generation of topics to be discussed in focus groups, interviews and in the interpretation of secondary

data (Gold 1958, in Singleton & Straits, 1999). Two focus groups were conducted, before the implementation of the catering changes in June 2009.

Interviews were used along with observations for two purposes: first, with the exploratory aim of familiarising the researcher with how the catering system in Durham colleges currently operated and what improvements and changes were made. In addition, information from interviews facilitated discussions with students about their experiences (Denzin & Lincoln, 2005). Initial focus groups, viewed as a beneficial precursor of more focused research (Threlfall, 1999), were employed as an exploratory research instrument. They also facilitated the development of more structured group interviews later, when the research questions were more clearly formulated.

Additional usage of the observations was made to cross-check the function of focus group findings. For example, the majority of students claimed that “fish was dripping in oil”, which was confirmed through visiting a number of colleges during lunch and dinner for three consecutive days, where detailed notes were taken.

### **3.3.2 Descriptive phase of the research**

Time was spent refining the question wording in order to formulate questions for the systematic measurement of students’ attitudes and reported behaviours. Review of the literature was performed once again in order to collect workable ideas for the construction of reliable measurement tools and methods of investigation. Additionally, successful dietary interventions were reviewed and the implications for Durham University’s specific situation.

Questions were formulated to assess specific occurrences of behaviours in students’ everyday eating experiences. These behaviours were previously identified during the exploratory phase through focus group discussions and participant observations. Relationships which were identified throughout the exploratory phase of the research were studied in depth. Topics covered during this stage were degree of students’

satisfaction with the college meal offering, healthiness of meals, catering improvements, assessment of the college-eating environment in terms of facilitating healthy eating choices and degree of usage of nutritional information.

Methods adopted during this phase were semi-structured observations and semi-structured group interviews. The structured nature of observations and interviews allowed greater control over sampling and measurement errors (Bryman, 2008; Singleton and Straits, 1999), while allowing the results to be characterised for Durham University's students living in college (Singleton and Straits, 1999).

The second series of focus group interviews were performed at that stage as well, in June 2010. The implementation of the catering changes have already been running for two full terms. The interviews were conducted with semi-structured elements, to measure systematically students' characteristics: attitudes to healthy eating, reported healthiness of eating behaviours, temptation to consume 'unhealthy' food, knowledge of healthy eating principles, perceived barriers to eat healthily and usage of nutritional information.

In addition, later focus group findings were cross-checked by comparison with the findings from the quantitative research results (McNamara, 1999) from the Durham Catering Survey 2010. There was an astonishing similarity with focus group findings. Small group interviews were employed to learn about students' attitudes, perceived difficulties and students suggestions how the college could assist them in making healthy eating choices. Students' willingness to use nutrition software to enable them to better meet their nutritional requirements was measured and an educational initiative included as part of the induction when students first come to university.

In the course of the semi-structured group interviews, relationships between variables were determined (food availability, nutritional knowledge) and reported unhealthy eating behaviours.

After the descriptive phase, a pre-test/post-test experiment was conducted in order to clarify results derived from the field observation and focus groups. The effectiveness of nutritional information was measured as a tool for eliciting desired healthy eating behaviours. Students were asked if they would be interested in having available the nutritional breakdown of foods offered during the week on the web or as a lecture as part of the introductory day when they first come to college.

### **3.4 METHODS**

#### **3.4.1 Focus Groups**

Areas of feedback sought from student focus groups

The adopted approach allowed exploration of awareness of healthy eating principles; desire to eat healthily; perceived quality of meals; confidence in control over healthy eating; choice and availability of healthy eating options during breakfast, lunch and dinners at college eating outlets; perceived limitations on making healthy eating choices.

#### **3.4.2 Semi-Structured Group Interviews**

The usage among students of the traffic light system and nutritional information displayed on food options (per single serving) was evaluated. The intention was to get a general idea of how many students actually make or attempt to make an informed choice.

Further feedback was requested about the adoption of choice architecture as a means of controlling intake of calories and healthiness of diet, without students' being worried to think about calories and nutritional information. Choice architecture would also account for the nutritional qualities of foods offered, as well as quantities of each food item consumed.

Students were asked to provide feedback on a potential online platform where they can track calories consumed throughout the day and modify food intake according to their nutritional needs or intentions. Such a software-integrated program has been one of the main ideas involved in the catering strategy.

### **3.4.3 Information Interviews (March–May 2009)**

Interviews with key informants provided information that would not have been obtained otherwise (Denzin & Lincoln, 2005) and also interpretations of secondary data from questionnaires and details given about the student population's characteristics (Kotler and Lee, 2008). In-depth interviews with decision makers and technical experts – Durham University's Head of Catering, Executive Chef and a professional nutritionist – were initiated early and throughout the investigation process to provide background information about catering processes, any current and future developments as well as the state of miscellaneous affairs, for example, problems the university faced providing low-fat nutritionally balanced meals, problematic issues with staff and training as well as possible solutions to these. Four qualitative in-depth interviews with key persons at Durham University were conducted to obtain a deeper understanding of the issues investigated.

#### *Shona Millar*

The first interview was with Shona Millar, Head of University and College Catering in the University Catering department, by whom I was introduced to the catering system, how it worked and some of the planned modifications in the work processes, improvements in food preparation and problems.

#### *Martyn Thompson*

The newly appointed executive chef, Martyn Thompson, also agreed to provide some general information about planned improvements of recipes, preparation methods and the strategy the college aims to implement to create nutritionally balanced meals for college students.

*Dr. Summerbell Interview, answered by Ms O'Malley, September 2009*

An interview was requested from Professor Summerbell, Professor of Human Nutrition at the School of Medicine & Health at Durham University. Professor Summerbell's interests and professional affiliation to the Obesity Related Behaviour Research Group made her a very suitable interviewee for the purposes of the research, but it was answered by Professor Summerbell's assistant. My questions were answered in the form of written correspondence, available in the Appendices.

After my second invitation to Dr Summerbell to discuss the nutritional balance of meals offered in college, I was again referred to Dr Summerbell's aid. Rather than answering my questions regarding the balance of new college meals, I was sent the same answers as for our initial communication in late 2009.

*June 2010*

The second interview was conducted with Shona Millar in order to explore how developments in the catering strategy are progressing.

Ricky Cohen, responsible for the College Catering Survey, invited me to exchange some insights and findings I had collected. He shared data from the catering survey 2010, which was not made available to the public. Findings from the observations and focus groups were cross-checked.

### **3.4.4 Observations**

#### **3.4.4.1 Unstructured observations, January–June 2009**

Visits were made on regular occasions, during different meal times, to each one of the five largest college eating locations. Visits were made alone and with other graduates and research students from Durham University, therefore observations were discussed and agreed with them. From the fourteen colleges in Durham, the five colleges that accommodated largest number of students were: Collingwood (550), Grey College (850), St Aidans (300), Van Mildert College (500) and St Mary's College (350) These colleges

cater mostly to undergraduate and a smaller number of graduate students. These colleges were chosen because of their size, allowing the observation to be more subtle and not intrusive to observed participants while also revealing a bigger picture for observation, saturating the data and revealing patterns in the behaviour of individuals and groups of students.

Observations were focused on meal options, queuing times, serving practices in college, student's actual meal choices, reports in the students' accounts from the focus groups and interviews were confirmed.

Field observations were extremely important to gain awareness of some of the issues students in focus groups discussed later in the focus groups. Those discussions were related to food preparation methods, food quality, availability, variety and taste of meals. As part of the observation, the researcher's dining within the colleges was planned, however, this did not happen due to the alarming nutritional characteristics of meals.

#### **3.4.4.2 Semi-structured observations, June 2010.**

This time observations were more focused on actual implementation and accuracy of procedures performed by college staff, cooking methods (baked vs. fried), availability of nutritional breakdown of foods, accuracy of nutritional labelling and food nutritional characteristics. These were all essential aspects of the food environment in colleges. Secondary research suggests that contextual variables prove to be the most influential factor when making meal choices (Stroebele and De Castro, 2004; Wansink, 1996; Wansink and Chardon, 2006; Wansink & Sobal, 2007; Popkin, Duffey and Gordon-Larsen, 2005). For that reason, creating healthy eating atmospheres would have an enormous effect, according to previous research (Gedrich, 2003; Wansink, 2004, 2005, 2006), in encouraging and stimulating healthy eating choices. For example, food preparation methods and availability of low-fat meals seemed to be quite a problematic issue according to students who participated in the focus groups. Therefore, confirming these accounts proved to be an essential aspect of students' environment, an important



aspect in the investigation of how to improve healthy eating environments at Durham colleges.

### **3.4.5 Quasi-Experimentation**

#### **3.4.5.1 Food Choice Experiment**

The food choice experiment design was one-group pre-test/post-test with treatment (independent variable), with measurement components before and after the treatment. The independent variable was the nutritional information that students were given after their initial choice; this was caloric value, grams of fat and sugar. The dependent variables were students' choices before and after the treatment. The aim of the experiment was to show whether nutritional information has an effect on students' decisions. The pre-test/post-test quasi-experimentation design was adopted because of the convenience sampling, therefore students were not randomly chosen.

##### **The pre-test**

Students were asked to choose what they normally ate at college and were given food options that their menu usually consisted of, or as follows: three main meals, three side options and a dessert option. Results from this step could also be considered as a control group of the experiment since there is no treatment variable yet.

**The treatment or independent variable**, performed immediately after the pre-test measurement.

Students were informed about the estimate of the total caloric value of their compound meal choice, which values were previously obtained from the nutritional breakdown for main meals at colleges, and nutritional values for the side options and desserts were estimated through <http://caloriecount.about.com>

### **The post-test**

Measurement of the post-test was performed immediately after giving students the information, then they were asked whether they would change their initial options if they knew the calorie estimate of their meals.

### **3.4.5.2. Cafeteria Experiment**

Traditional promotion techniques through displaying healthy eating posters in the university cafeteria were explored. Limitation of available resources has not allowed the full manipulation of settings and arrangement of food, presentation and other known influential factors. The experiment was conducted at Kingston University's cafeteria, because of the researcher's proximity to the location.

The lunch offering at the cafeteria was somewhat limited compared to that offered in Durham University's colleges. Breakfast items included: muesli with fruit and yogurt, porridge or cornflakes with milk. The lunch menu included a choice of three main meals plus three side options, offered daily from 11-3pm. The cafeteria offered a daily vegetarian soup and pre-packed salads with protein options available for additional payment (tuna, chicken and cheese). Three types of fruit (oranges or satsumas, apples and bananas) were offered throughout the day.

Each week, three healthy eating posters were displayed, aiming to increase the consumption of fruit, salads and soups. Posters displayed during the same week focused on one of the following themes: Entertaining, Celebrity, Functional and Healthy Eating. Poster themes were suggestive of choosing healthy fulfilling light lunch options. A small survey was conducted among Kingston University's students. Four nutritional posters were shown to each student and they were asked for feedback as to which they liked the most and whether they noticed it while it was on display for a week at the café. I showed the posters to 37 students. This was the number of students who agreed to be interviewed for one whole afternoon (12-5pm) at Kingston University's cafeteria (May 27, 2010). The number of participants was chosen on convenience grounds, and depended upon the

respondents' agreement to participate. Students were shown the healthy eating posters used in the café experiment and were asked to comment on them. They were asked to identify which poster they liked most and whether they would follow the coinciding message. Three were presented: generic healthy eating, celebrity, entertaining and health benefit. A copy of the posters can be found in Appendices. The posters were created by the researcher. The results, however, should not be regarded as generalizable for a number of reasons and the limitations of the enquiry method, sampling and validity issues are discussed later.

### ***3.5 INSTRUMENTATION PROCEDURES***

#### **3.5.1. Recruitment**

In order to put the participants of the focus groups at ease, they were approached in their leisure time, usually around college or in the college canteen. They were usually in small to medium groups. Such a strategy is well accepted and helps respondents conduct casual but purposeful enquiries (Denzin & Lincoln, 2005).

Participants in the first focus group (June 2009) were recruited through a Facebook campaign, where students were invited to discuss the topic "Healthy eating at college". The second focus group took place in January 2010. Students were in their leisure time, just before the start of the second term and were approached and asked if they would like to participate in a focus group. This purpose of this focus group was again to investigate students' experience with food on campus, however, more questions were asked about the impact (social influence) of other students' choice on them.

The rest of the focus groups, 12 in total, from which there were 10 mini focus groups, were conducted at some point in students' leisure time around the college, usually around their own college. Such a strategy is well accepted and would encourage respondents to answer casual but purposeful enquiries (Denzin & Lincoln, 2005). Groups of at least

three students were approached. Despite the relatively small size, small focus groups worked much better, and provided a greater opportunity for students to express themselves and allowed all participants to participate fully in the interviews. Students had a lot to share about their experiences.

Participants in the 14 focus groups were not told about the actual aim of the interviews, so as not to influence their responses. Generally, groups of at least four students were approached, however, because of the sunny weather, many of them were in smaller groups, about two or three at a time. Smaller groups seemed to work much better, provided greater depth and all the participants were able to participate fully in the discussions. Moreover, participants seemed very comfortable talking about the topic, compared to the first and second focus groups, where some students seemed to be more cautious about their comments, perhaps so as not to offend someone with their opinions and beliefs. This might be due to the fact that participants felt more at ease to communicate when in their leisure time.

When interviewing, I have tried to make a great effort to make participants feel at ease and have told them I am a student like them, doing my required qualitative research. They were all very collaborative and willing to participate, more than I had expected. I related easily to them and was perceived as one of them, making me confident that answers to most questions should be quite reliable.

All participants in the focus groups and the in-depth interview were not told the aim of the study. The actual research questions were purposively omitted since it was possible for responses to be distorted. This helped to minimise participants portraying themselves in the way in which they wished to be seen rather than honestly (Krueger, 1988) and also reduced their self-consciousness (Hoffman 1980, in Bogdan & Taylor, 1998), them hiding things or acting in a way which would not benefit the aim of the study (Bogdan & Taylor, 1998).

Focus groups consisted of between three and six people, which allowed the expression of the opinions of each of the participants without individuals dominating the group. Some more shy individuals were specially asked for their opinion to “ensure fullest coverage of the topic” (Denzin & Lincoln, 2005).

Questions that were asked were differentiated in that they were exploratory, phenomenological. However, the wording of questions was adapted to the question type, meaning that pre-test questions, which related to the choice architecture and the software, were carefully explained, with the intention to provide a better understanding of the way those would work.

### **3.5.2 Participants**

Participants in the study were all Durham University students, living in catered colleges. In total, 57 students participated in the focus groups.

37 female students; 20 male students = 57

45 undergraduate students; 12 graduates = 57

39 UK; 18 non-UK = 57

#### **Exploratory phase of research: 2009-Jan 2010**

Two focus groups, 14 students participated.

Ustinov College (June 2009), one focus group, eight students (pre-arranged through Facebook).

Grey College (January, 2010) one focus group, six students.

#### **Descriptive phase of the research: June 2010**

43 Durham University students participated

Two focus groups and ten mini-focus groups were conducted in the five pre-selected colleges.

These were as follows:

Collingwood (550), two mini-focus groups (6), one full focus groups (5) = (11 students)

Grey College (850), two mini-focus groups (7), one full focus groups (6) = (13 students)

Van Mildert College (500) two mini-focus groups (7 students)

St Mary's College (350) two mini-focus groups (6 students)

St Aidans (300) two mini focus groups (6 students)

\* Number in brackets after each college represents the number of students.

### **Testing hypotheses through quasi-experimentation**

Participants in Food Choice Quasi-Experiment

18 female students; 5 male students = 23

20 undergraduate students

3 graduate students

### **Poster Experiment**

37 Kingston University students.

No gender and level of study were noted.

### **3.5.3 Sampling**

Criterion sampling (Patton, 2002) was adopted throughout the study. The criteria were set in order for the samples to be representative of the population that lives in colleges and to ensure students' familiarity with college meal practices, as well as to ensure the reproduction of participants' experience. Therefore, the only requirement set for all participants in focus groups was that they were students at Durham University, and eat regularly at their college.

The number of focus groups was decided based on the number of students every college accommodates. Therefore, it was decided to set a minimum number of students (focus groups) to be representative of each college, and the two full focus groups were conducted at the largest colleges. After the focus groups were conducted, it was

calculated that from every college, approximately every 59<sup>th</sup> student had taken part in the focus groups.

No additional requirements were set for the quasi-experiments, however, a requirement for the “Poster Experiment” was that students had dined in the Kingston University cafeteria at least twice a week in the past four weeks. This was a necessary requirement so that students were exposed to the nutritional posters.

Population heterogeneity was also aimed at – for example students from diverse backgrounds were approached – however, more female students agreed to participate in the focus groups as well as in the quasi-experiments, and they were more often seen in groups around the campus. At a later stage of the research, a control procedure was adopted, to ensure that the sample was representative of the population, through cross-checking with Durham Catering Survey 2010.

The concept of saturation was adopted for the focus group sample size, so that no new information and themes were acquired through the group interviews (Strauss & Corbin, 1990). This was achieved early in the focus groups.

#### **3.5.4 Informed consent**

Students were not asked to provide their names, age or any other unique information which would distinguish or identify them, and no personal information would be used or revealed to third parties. Participation was not compulsory and they were told that if they did not feel comfortable with the topic, they could leave at any time. Students were not asked to declare if they had any health problems or problems related to eating behaviour. They were told how to, and that they could, contact the researcher if they had any questions after the focus group had finished.

The cafeteria experiment did not require informed consent, because this could have had an effect on the experiment results. Experimental manipulations were coordinated with the management and staff of the cafeteria outlet and their consent was received verbally.

### **3.5.5 Building rapport**

All participants were very collaborative and willing to participate. Relating to the researcher directly, students answered to most questions straightforwardly while expressing their opinions freely about their eating habits, preferences and opinions. Participants seemed very comfortable talking about the topics and seemed interested in doing so. There were a few cases when students seemed to be more cautious about sharing their opinions. In those cases notes were made and the cases were analysed accordingly.

Specific situations allowed the identification of key informants and established excellent rapport with them. They provided me with very in-depth inside information and personal experiences, which allowed me to acquire a momentary insight into their personal perspective. Acting naively when doing exploratory research allowed me to make intentional statements like “I don’t understand”, “Really”, “What do you mean?” and that I didn’t know, known as interviewing by comment (Snow, Zurcker and Sjoberg (1982) in Singleton and Straits (1999))

## **3.6 MEASUREMENT**

Theoretical definitions of healthy eating guided the organization of appropriate measures of concepts. The concept of healthy eating depended on variables like nutritional education, availability of healthy food options on the menu, display of nutritional information, personal preferences and/or other. Various types of questions were asked. In addition to action questions (past behaviour), opinion and value questions aimed to understand the participants’ cognitive and interpretative processes regarding healthy



eating at college. These questions aimed to explore what students thought about these experiences, what were their desires, preferences and expectations (Patton, 2002). Knowledge questions were also included since measuring participants' understanding of nutritional principles was an important prerequisite to make healthy choices and also to use the traffic light system, a catering improvement aiming to improve healthy eating. When covering topics on individual and social factors influencing students' healthy eating decisions, however, no specific questions were formulated to assess them; they were noted either when students' explicitly stated them or described such situations.

### **3.6.1 Record of data**

Data was recorded manually or with a voice recorder when conditions allowed. However, manual recording was adopted as a means of keeping records of what participants' feedback was for most focus group interviews. Additional rationale for this method of keeping recordings is that initial efforts to record the discussions were somewhat unfruitful. When participants were asked if they would mind being digitally recorded, respondents seemed intimidated but did not mind, however, their answers seem more reserved, general and lacking the information I was looking for. Some students, when they noticed I was writing down what they said, they showed significantly more confidence and improved participation levels.

### **3.6.2. Question Wording**

Question formulation was informed by the literature in order to obtain higher reliability of responses by the participants. Questions were semi-structured and open-ended to allow students to answer from a range of angles (Bradburd, Sudman and Wansink, 2004). The instrument was pilot tested for clarity and content validity. Ten students were given the predetermined focus groups questions and were asked to interpret the question and answer them. Neutral and clearly stated questions regarding past experiences, opinions, and knowledge were asked. For example, according to Koster (2006) and Wansink et al.

(2004), questions about past behaviours are a better predictor of actual behaviour rather than attitude and intention questions (Ajzen & Fishbein). Healthy eating is considered a rather sensitive topic, and as a result tends to elicit socially desirable responses from participants, requiring attention to question wording. Additionally, illustrative questions were sometimes asked, so that participants were not uncomfortable sharing sensitive information. For example, some students felt quite reserved initially to share their honest opinions, therefore saying something like “I have heard of pretty much all kinds of opinions about this and that” made them feel more relaxed and they spoke openly about the topic. Similar were situations when talking about calories and making healthy choices; portraying oneself as “uninformed” was a winning strategy.

Included were questions that assess students’ intentions to eat healthily. Those were adapted from the behavioural model of Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 2010). Questions were asked about participants’, attitude and beliefs about healthy eating, their normative and control beliefs (Fishbein and Ajzen, 2010). In addition, questions were asked about participants’ actual behaviours or past behaviours. Questions about past behaviours are considered to provide the researcher with more reliable accounts of participants’ actual intentions and behaviours (Koster, 2004). Therefore, rather than asking about intentions to perform a behaviour, participants were asked about exact, rather than general, time periods and exact examples in order to increase the accuracy of their responses (Bradburd, Sudman & Wansink, 2004).

Accuracy of estimates was additionally enhanced through asking clear questions and clarification questions related to exceptions of regular behaviours. Open-ended questions and probing questions were used in order to obtain the greatest possible depth and clarity on the issue. As a critical validity check questions were adopted asking participants about their feelings, motives and interpretations of events as per Singleton and Straits’ (1999) advice.

### **3.6.3 Operational Definitions**

#### Nutrition Knowledge and Healthy Eating Assessment

This was assessed by asking questions about participants' daily caloric requirements; awareness of major health benefits or risks that are related to healthy and unhealthy eating (Adapted from Wardle & Parmenter, 1999).

Attitude and perceived norms towards healthy eating: Do you try to eat healthy and how important is it for you/your friends to eat healthily?

Perceived Behavioural Control: How easy for you is to eat healthily in college?

Label Reading Behaviour: This was determined by the question as to whether they look at nutritional food labels when choosing a meal.

Example of an open-ended question: If you had the chance to improve or change something in the present meal offering what would it be?

Information was sought about four additional aspects of college food: variety, healthiness, availability and convenience.

### **3.6.4 Data Analysis**

#### **3.6.4.1 Deductive Analysis**

Concepts derived from the literature were used as a source for data comparison and to enhance understanding and sensitivity to subtle dimensions in data (Strauss & Corbin, 1998) in addition, as a secondary source of data (Strauss & Corbin, 1998; p.51) from related journal publications. Literature was also used to stimulate investigation during the data analysis (Strauss & Corbin, 1998). The developed categories were sufficiently grounded in the empirical data, and were not forced into theoretical concepts from the literature (Kelle, 2005).

### **3.6.4.2 Inductive data analysis**

The inductive data analysis was guided by the literature on grounded theory (Strauss, 1987; Strauss and Corbin, 1990). Thus, the data analysis could begin as soon as the data collection process started: it was ongoing and inductive. The early and ongoing analysis was necessary for a number of reasons. By overlapping the phases of data collection and analysis, it was possible to control the research strategy, and shift the focus of the investigation to subject matters that required further explanation and investigation, (Glaser and Holton, 2004, para 51). As soon as the data collection began, it was simultaneously analysed and the interpretation of the informants' perspectives was conducted.

### **3.6.4.3 Data Coding**

The use of codes brought order, structure and meaning to raw data (Strauss and Corbin, 1990). Thus, continuing comparison of the codes and categories that emerged with the subsequently collected data and the concepts suggested by the literature (Glaser and Strauss, 1967), along with the search for relationships among emerging categories of data and linkages (Strauss and Corbin, 1990) were performed.

Notes review was carried out throughout the analysis, which was useful for coding clarification, and justification for organizing information into meaningful units. These notes also served as a reminder of the logic behind the interpretations that were made at the early stage of analysis (Strauss and Corbin, 1990).

Data coding was performed by examining the field notes that were later broken down into core categories. These core categories then developed into a manageable coding scheme. For instance, as a response to the question 'what are the reasons you would eat unhealthy?', a student would answer "too much high fat foods", "limited choice of low fat meals", "literally pasta and chips only", "there are no meal options with more than

one green light” or “too much mayonnaise salads” were coded as “Variety of Food Offering” and brought together under the theme “Food Availability”. When students were asked what solutions they could think of, they would answer “change the cooks” or “more light meals should be included”; those were coded “Food Preparation”. Later “Food Availability” brought together the inter-related codes (Variety of Food & Preparation Method) because what was seen as essential was the availability of a variety of healthy light options, rather than an actual variety of foods.

Data coding and analysis were further executed by a trained analyst so that analytical triangulation was also achieved. Data coding and analysis were mutually synchronized. Additionally, data was coded with the qualitative analysis software Hyper Research where data was coded line by line and detailed categories emerged. Subsequently, a more holistic approach was adopted and common themes in the data were grouped into categories. Codes were often inclusive, in that they were assigned into more than one category. These usually evolved into sub-categories and later into central themes, which were usually exclusive. A number of refinements took place in order to group data in meaningful ways and prepare it for the analysis.

A separate way to analyse data was to do that in the context in which it occurred and recognize substantive relationships rather than categorization of data. In this way, the meaning was not lost and any interrelatedness was not lost through data extraction.

The process ceased once theoretical saturation was reached and no more new codes, patterns or themes were generated. At this stage, the analysis shifted from open coding to core categories. Core categories were the ones that repeatedly emerged throughout the data, and were easily related to the other categories in a meaningful way (Holton, 2007).

#### **3.6.4.4. Quantitative Calculations**

Data from the food choice experiment and the semi-structured interviews were calculated by adopting simple arithmetic calculations.

### **3.7 Benefits Of The Adopted Approach**

Denzin and Lincoln (2005) claim that triangulation of some research designs to be especially harmonious combinations since they do not share same methodological weaknesses, essentially, combining research methods that have different strengths and limitations (Singleton and Straits, 1999). For example, in terms of content restrictions, investigator and reactive measurement error, field research has just moderate limitations, however, the internal validity is highly susceptible to “lack of control for extraneous variables” (p.410), sampling error and non-replicative. Survey research (structured interviews) has low susceptibility to measurement, sampling and non-replicability error, medium susceptibility to internal invalidity and content restrictions and high susceptibility to measurement errors and investigator errors. Experiments generally have low susceptibility to internal invalidity, are easy to measure and are replicable. Therefore, it was checked whether the data from observations, focus groups and interviews corroborate with the quantitative secondary data, as Silverman (2006) recommends.

Krueger (1988) states that focus groups in combination with quantitative study produces triangulation, obtaining “both depth and breadth of information” (p.41). What is more, in the present research, the data collected for the Durham Catering Survey could be regarded as high quality research, considering it had been prepared and administered by professional researchers. In addition, the performance of examining similar and exactly the same topics enabled the examination of questions repeated over time (Singleton & Straits, 1999). The criterion sampling adopted throughout the study is an additional assurance in terms of the quality of results (Patton, 2002).

Participant triangulation (Threlfall, 1999) was partly achieved. Focussing on common topics, perspectives from the major actors in the study were explored. Those included university management staff and students, however, no significant information was obtained from the staff working in colleges. The reason was usually that they needed permission from the unit manager or were reluctant to respond back to my questions regarding the preparation methods.

### **3.7.1 Internal validity**

Partial external validity was achieved through the inclusion of the experimental feature of the research. However, some would argue that findings might be said to be generalizable to the student population at Durham University.

The study is more focused on reliability and validation of the accuracy of research results: attitudes and perceptions of the population being studied. However, the underlining aim was to assess implementation procedures that take place in the university and evaluate potential for implementation of social marketing. These initiatives would be targeting improvement of environmental factors from the student environment such as provision of nutritionally balanced meals (dietary fat not exceeding 30%), and low-fat options, as well as an overall reduction of calorie intake.

Reliability of findings from observation was the achieved “agreement between participants and observers” to what is happening in a particular situation (Denzin and Lincoln, 2005, p.733). Observation of the college premises specifically aimed to describe objective events like meal offerings (foods available to students during breakfast, lunch and dinner meal times), and to make notes of the availability and display of nutritional information and observe whether students make use of this nutritional information.

### **3.7.2 Measures to rule out threats to validity**

The present study is high on validity, as it has drawn on the consistency of responses (Creswell, 2003). Triangulation was appropriate for the study. In order to achieve improved external and internal validity and cross-check findings (Singleton and Straits, 1999), mixed qualitative methods were employed – interviews, focus groups, structured group interviews, observations, analysis of survey, and pre-test/post-test quasi-experiment. Cross-check of findings from focus groups was made by reviewing open-

ended questions, part of the Durham Catering Survey 2010, where no significantly different data were found. On the contrary, most, if not all accounts from focus groups were confirmed, however, these were regarded as “confidential information” by Ricky Cohen, therefore additional use of the data has not been utilized.

The study has employed a variety of qualitative research tools and used secondary quantitative and qualitative data (open-ended responses) to cross-check for external validity (Singleton & Straits, 1999). Moreover, three instruments were developed to measure the same research questions. For example, findings from focus groups, interviews and observations were used as a cross-check of the data obtained from these. Additionally, the use of “diverse measures also strengthens inferences by controlling for systematic error in any one measure” (Singleton & Straits, 1999, p.230). Furthermore, the measurement processes were reproduced at different times (results were consistent in time), controlling for major threats of instrumentation and history (Singleton & Straits, 1999; Silverman, 2006).

Quasi-experimentation designs, regarded as controlling imperfectly for external variables, could still rival out explanations through the application of intelligent design features, supplementary data and sound judgement (Singleton & Straits, 1999). Besides, the maturation and history threats to one group pre-test/post-test design in quasi-experimentation can be ruled out in the present research since the period between the pre-test and post-test were insignificant (Singleton & Straits, 1999). However, testing effect remains, and cannot be ruled out completely.

Addressing the validity of focus groups, Krueger (1988) points out these normally have high face validity, or “believability of comments from participants” (p.42). Seemingly “infinitely believable” (p.42) results from focus groups have found wide application by decision makers. Additionally, the measurement of the present problem of enquiry (healthy eating behaviours) was suitable for focus group discussions (Krueger, 1988; Andreasen, 2007; Bradburd, Sudman & Wansink, 2004).



### **3.8 Limitations Of The Present Research**

In the interpretation of the findings, as Lofland and Lofland claim, “there is no single way to interpret social worlds”(Lofland & Lofland, 1995, p.195) and the study has certainly been influenced by the interpreter’s standpoint (Denzin & Lincoln, 2005). Lincoln and Denzin (2005) claim that the “there is no possibility of theory free knowledge” and that “we can no longer think of ourselves as neutral spectators of the social world” (Denzin & Lincoln, 2005, p.420). Therefore the research concentration might have be influenced by the literature review, which has produced theory informed research findings as a result, rather than purely inductive findings. Interviews, also, being considered “neutrally impossible” (Denzin & Lincoln, 2005), were used to obtain information about regulations, changes and future initiatives.

#### **3.8.1 Limitation of Secondary Data**

Secondary data used in the research was acquired through quantitative surveys specifically developed to assess student satisfaction with the college catering. There are certain limitations however, for instance, the data was gathered for administrative purposes assessing student satisfaction. In addition, the researcher’s standpoint (Clark, 2005; White, 2003) and his rapport building capabilities are beyond control.

#### **3.8.2 Limitations of Interviews and Focus Groups**

Interviews, being considered neutrally impossible (Denzin & Lincoln, 2005), have been employed with the purpose of acquiring information about common practices, procedures and future plans for development. Interviews were conducted with Durham University staff directly responsible for, or well informed about, catering practices within the university.

A potential drawback of focus groups might be participants' insincere feedback since they often report in the way "they wish to be seen as opposed to how they are" (Krueger, 1988; p 23). Contrary to that, Bogdan and Taylor (1998) regard the "ideal research setting [as] one in which the observer obtains easy access to the respondent, establishes immediate rapport with informants, and gathers data directly related to the research interest".

Focus group results can generally be biased. Participants in them were not chosen scientifically therefore the findings can not be projected on to the whole Durham University student population. Moreover results from them are dependent on dynamics between respondents and moderator.

### **3.8.4 Limitations of quasi-experimental design**

Although the design of the quasi-experiments provided a basis for comparison, the results are subject to major threats to validity. Major drawbacks of quasi-experimental design are the impossibility of randomness, that the control group could not be incorporated as a comparison and the tight control over participants.

There are also internal threats to validity, like history, events in the environment of the subject or that occur during the experimentation, for example, students were not alone when deciding on their food choices, which might have influenced their responses (Singleton & Straits, 1999).

Maturation, the physical and psychological state of the person undergoing the experiment, might influence results. For example, if students have not eaten prior to the experiment, this might have an effect over their choice. Singleton and Straits (1999) give the example of hunger, however, the focus groups have taken place in the early afternoon, after lunch, therefore students should have eaten by default. Moreover, this threat to validity was taken care of by formulating the research question about the participants' usual/ past behaviour (Bradburd, Sudman and Wansink, 2004): "What would you normally eat for lunch?", not for example "What would you choose to eat?".

Moreover, the testing effect, where people score better or choose socially desirable answers, is a potential threat to internal validity (Singleton and Straits, 1999). However, the actual purpose of the experiment was not revealed to participants. Therefore pre-test results (before introducing the treatment) might be argued to score higher in validity compared to post-test results when the subjects were presented with nutritional information and asked whether this would affect their food choice.

Instrumentation is also a source of threats to internal validity, for example, any misunderstandings or changes in instrumentation or measurement procedures. However, these were eliminated and reduced to a minimum. All participants in the study had to choose from the same food grid and the question wording was same and determined in advance.

The implementation of any research approach, research design and methods of enquiry and analysis of data involve compromises (Patton, 2003). Smith and Deemer (2003) go on to emphasize that there is no method of enquiry that can be a neutral tool, therefore the concept of procedural objectivity cannot be maintained (Smith and Deemer, 2003 (p.427) Denzin and Lincoln, 2003).

### **3.8.5 Other Biases**

Investigator's biases also should not be overlooked. Previous knowledge in healthy eating behaviours and being very knowledgeable of healthy eating principles might have affected observation results by selectively placing greater significance on certain aspects of the college environment. The researcher has attended a course devoted to focus group research before conducting the study.

# CHAPTER 4 FINDINGS

## **Overview**

With the development of the research agenda, it became clear most students were informed about healthy eating principles, demonstrated understanding of preparation and cooking processes and pointed to them as major impediments to eating healthily at college. Additionally, many students were aware that main meals at college were moderately high and high in fat and calorie values. However, a great proportion of students felt disengaged with healthy eating practices and the desire to eat healthily. Both groups of students, those engaged and those disengaged with healthy eating practices, comprised similar opinions about their experience with food on campus. The most common description of the food in colleges was that it was very high in fat, and lighter options as well as light preparation method were suggested.

The majority of students who participated in the focus groups did not express the desire to eat healthily. This was partly because students were not aware of the importance of healthy eating and also because they “did not feel, or have any health issues yet” (male, British, Grey College, Durham 2010). However, there were health conscious individuals, mostly women, who were well aware of the issues and were consciously trying to eat healthily. Food choice experiments have shown that students divide again into roughly two groups: those trying to eat healthily and those not paying attention to this.

## **4.1 Application of Research Findings**

The findings are used to provide specific information of the student population dining at Durham University’s colleges. The qualitative information describing the student population’s characteristics, combined with the quantitative description of their eating behaviours and intentions and observational studies of college eating environments provides a rounded overview of the current situation. This knowledge would enable public health and social marketing professionals, as well as any other interested parties, to initiate a healthy eating campaign that aims to improve behaviours of students eating at

Durham University's colleges. Problematic issues identified through students' focus groups would be useful in the formulation of strategies targeting the improvement of students' nutritional situation. Assessment of the current catering system and the meal offering assists students to make better, educated food choices, while encouraging healthy eating meal options. Additionally, this information has been provided to the management team of the University and Colleges for consulting purposes. Also, the findings and recommendations could be used as feedback on current processes and planning of future initiatives of the catering strategy.

## ***4.2 Information Interviews***

### **4.2.1 Shona Millar, Head of University Catering, April 2009**

Shona Millar, Head of University and Colleges Catering, explained that the University is making real efforts to provide its students with a healthy and varied meal offering and real efforts are made in this direction. A number of steps that were made towards this goal, such as the introduction of improved menus, were, as Ms Millar said, a "great success". College meals, however, have not been prepared by nutritionists and were not assessed as to whether they provided the required nutrition to students and sporting individuals. Professor of Nutrition at Queens campus, Carolyn Summerbell, and the catering team were working together towards the development of such meals. Shona also shared the information that a special outlet was being planned for sport students, tailored to their special needs.

Additionally, refurbishing of kitchen facilities would allow every college to prepare meals from scratch and in a healthy way. Accordingly, catering personnel underwent a number of training courses to enhance healthy food preparation knowledge and skills. College staff experienced "a lack of knowledge of what is nutritious food." Therefore, "every chef attended a nutrition course to help them understand what is good and what is

bad” (Shona Millars Interview, April 2009). New food preparation guidelines were established.

Additionally, informed choice was a priority within the catering strategy, therefore all colleges should display the nutritional characteristics of main meals. However, there was a serious debate on the caloric values of meals since there were some drastic differences between the nutritional requirements of various groups of the student population. On one side, sporting individuals have nutritional requirements of as much as 8000 kCal per day, and on the other, small females’ nutritional requirements may not exceed 1600 kcal a day.

Ms Millar shared the information that choice architecture is already applied in some areas, like offering brown and white bread; later they switched to 30/70 respectively. In this way students would not realize how they are changing to healthier choices, since the “naughty options are still there”, but more healthy ones are available.

#### **4.2.2 Martyn Thompson, Head Chef at University Colleges, April 2010**

The newly appointed Head Chef shared the information that the Catering Committee’s critics about the high value of meals are still answer to be looked into and their intention was to create nutritionally balanced meals. The need for training for college staff and their ‘stubbornness’ to accept new preparation methods were pointed out again. As was the adherence to exact quantities in recipes, as college staff were used to cook meals in certain way sometimes for about 10-20 years and changing their practices and trying to train them according to recent institutionally established regulations was problematic.

Shona Millar, June 2010

Ms Millar gave information about the current trial in three colleges with reduced menus. The breakfast and lunch offering were under consideration, specifically the cooked items. Under consideration was the introduction of two days of lighter snacks, yogurt and a

salad bar. Special menus for athletes were also under development, which would be served at Maiden Castle.

All colleges were given written recipes, and these were nutritionally analysed. Therefore following the exact recipes was essential for budget control and the accuracy of the nutrition breakdown. However, serious obstacles to these were the individual colleges chefs' judgements and self-initiatives in following recipes and cooking methods. Therefore, Shona concluded, there is an urgent need for an audit.

She added that adjustments were made constantly while the work was in progress, especially after the first week of introducing something new. Feedback was sought from students. Ms Millar concluded this was the term with the least complaints, so she was really hopeful that things were going in the right direction.

#### **4.2.3 Mr Ricky Cohen, Deputy Head of Catering, June 2010**

The purpose of this meeting was to cross-check data from the focus groups during the same week (June, 2010). Mr Cohen showed me the additional feedback of students from the Catering Survey in the form of an Excel spreadsheet. This data clearly contained almost identical comments from students regarding the College Catering. Students consistently expressed their dissatisfaction with the "high fat meals", pointing out "incorrect nutrition labels", and advising about changes in preparation methods: "too much fried food".

## **4.3 Focus Groups Findings**

### **4.3.1 Exploratory Focus Groups**

#### **4.3.1.1 Social Factors Influencing Healthy Eating**

Students usually spend their time at college in groups, both in their study, dining and leisure time. Spending time with other people seemed to influence students' decisions as regards food choices that were clearly 'wrong' according to their own judgement. "*When people around you eat unhealthily, you start eating unhealthily as well. I can't go out with them and not eat when everyone else is*" – female student, non-British, Grey College (2<sup>nd</sup> year). What was interesting was that they were much more likely to go for a dessert if their friend went for it, because they "*don't feel that guilty*". Even students, who stated they were trying to limit themselves, usually went for quite unhealthy options. Most students' admitted being tempted to eat unhealthily, "*because everyone does*" or that they "*try to eat healthy but temptation is there*" and "*especially after a night out*" – female, British, Josephine Butler College (2<sup>nd</sup> year).

#### **4.3.1.2 Healthy Eating Beliefs, Attitude and Behaviours**

Generally, male and female students reported not being concerned about healthy eating and were not mindfully thinking about it. Most students reported eating according to what was available, and what they liked, and some reported choosing depending on what they had eaten during the day. Most students admitted not deciding what to eat based on what is healthy, since they "*would eat what they liked*" – female, British, Grey College, (3<sup>rd</sup> Year). Another student said he believed he would start being watchful for healthy eating when he started having "health and weight problems" – male, British, Grey College (3<sup>rd</sup> year), after which everyone in the group agreed. Most female and male students admitted eating unhealthily, "especially after nights out".



### **4.3.1.3 Changes in Food Habits After Moving to College**

Most students claimed that the quantity of food they consumed since they started college had increased. They ate comparatively more and differently than they would normally have eaten at home. The explanation was because the food was new and also because they had already paid for that food and preferred not to spend money on food later on during the day. Some reported that even if they didn't feel hungry they ate because of similar reasons. Some students reported usually feeling satisfied long before finishing their meals. Two male graduate students (non-British, Ustinov College), regularly participating in sport, considered that they ate "more than the people around them"; one said "I feel so heavy after a meal in the college", followed by "Even a single meal at the college can provide you with as many as 1000 calories." "Too much food" was a common comment about the meal portions, and most students in the groups completely agreed verbally or non-verbally by nodding. Most students also ate desserts daily, usually offered at dinner time (including Breakfast and Lunch desserts – yogurt and fruit), except when it is something they "*do not like*".

### **4.3.2 Descriptive Focus Group Results**

#### **4.3.2.1 Overall Food Quality**

Most students believed that the new menu was a lot better than "before", since it offered more choice. Most students understood the college's effort and ability to provide food for so many students, and that compromises were necessary for the price they were paying. However, some were really dubious, commenting that surely it is "not chips every time, every day" since there were other potato options like "mash and oven baked".

Generally students commented that the price they were paying to eat at college was reasonable for the meals they received in terms of quality and variety. Most female and male students agreed that the food was enough and you could eat healthily. However, the

choice of healthy foods was perceived as quite limited by most students; some admitted “going for unhealthy foods because “there is nothing left I would eat”. Another relatively health conscious girl (compared to others) said “There are seldom more than one green light on menu items, and most of the time they were amber/red, high in fat. Students in this group agreed that healthy options were not good, even when trying to eat healthily. Some students were concerned with the packed lunch offering, which was sandwich, fruit and crisps, “which everyone knows is very unhealthy!” The same student explicitly made clear that she was not conscious about healthy eating, and did not know how much her average calorie intake was, also the traffic lights were described as confusing and she did not use them, “because everything is most of the time orange or red.”

Breakfast and Brunch, were well liked among both female and male students. Fruit was generally perceived as of low or satisfactory quality and variety. Salads were well liked, but some students commented that there is no salad bar at dinner, and only if left from lunch, perceived as a criticism. Also, pasta salads came with pre-added mayo, when you had mayo on the side as well.

It was very interesting to discover that most male and female students did not like or “*hated*” the Sunday Lunch, as did all of their friends. In fact, not one student expressed liking in the focus groups. Most often it was described as “heavy and sludgy”. Some students said they do not go to Sunday Lunch at all, and in another focus group they said they “prefer to order pizza than go to the Sunday roast.”

#### **4.3.2.2 Food Preparation and Availability of Food**

Food “preparation method”, “food quality” and “food availability/variety” have emerged in every one of the 12 focus groups as a main issue when eating at college premises. However, these were integrated into one core category in order to provide a full and thick description of the students’ dining experience at college.

*Students from all focus groups described the food as “high-fat”. An interesting sarcastic comment came from a male student (British, 3<sup>rd</sup> Year) “Good variety of fried and oily food, which are too high in calorie content”.*

A common statement among focus groups was *“too much choice”, “you want to eat from everything.”*, as well as *“a bit less food to be offered for lunch”* – female student, British, Grey College (2<sup>nd</sup> Year). In general, students reported general satisfaction with value for money, however, they would expect a bit more in terms of low-fat meal options.

#### **4.3.2.3 Nutritional Information Usage**

Most students reported not looking at the nutritional display of meals. Very few female students reported checking the nutritional information when making their choice and some students reported looking at it as a reference but not every time. Some reported that they did not look at the calories but didn't eat the 'all red' food options. Few students reported not being aware of the nutritional labelling. One student even asked with noticeable surprise, *“What was that traffic light all about?”* Some students raised a concern as to why *“calories are displayed only for main dishes”*, an interesting question to be looked into in further detail by college management.

Mostly female students commented that main meal calories are *“very high even if you eat only the main meal”*, *“too much high fat options”* (students in this focus group were aware of healthy eating practices, compared to most students in the whole sample).

A frequent comment among focus groups was about the inconsistency of the nutrition display. Some also described it as *“missing”*, *“hardly visible”* and mentioned having problems understanding the traffic light system.

Some females suggested that lighter meal options should be available, rather than trying to figure out what is healthy. The same focus group noted that deciding yourself on the basis of the traffic light system was somehow tricky because *“most of the traffic lights are amber red and usually the green light is for salt, when its meat/sugars are green”*.

## **4.4 Observation Findings**

### **4.4.1 Un-structured Observations June 2009**

**Visited Colleges:** St. Aidan's College, Colingwood, Grey College, St. Mary's College.

When visiting the colleges, students were having either lunch or dinner at the college. Students were eating in groups on long tables chatting with each other. I have had the opportunity to have meals at the above-mentioned colleges. These experiences allowed me to grasp an insight in the students' experience of college food, and to fully understand the reasons why the topic of food was such a huge issue for them. Regarding the general meal offering, most meals, including side options, were visibly high in fat, and/or deep-fried or oven baked in a deep pan with oil. Salad bars were usually in the hall where students were dining. Salad refills were possible, however, I never saw a student going back for a refill. Students' queuing times were not significant in my perception, although the length of queues at the beginning of meal times were evident.

About the general meal offering, most meals, including side options were visibly with high fat content, and/or deep-fried or oven backed in deep pan with oil.

Potatoes were coming in all different kinds, however preparation method might have influenced the nutrition of these to be high in fat. There were vending machines available throughout the college areas. They usually were stocked with high sugar drinks or salty and sweet snack foods, however these were crisps, sodas, chocolate bars and other. Additionally, food items were available through tuck shops throughout the campus. Offering of high sugar and high fat foods was widespread, and the visibility of these was enhanced further through food arrangement. For example, sweet and salty snack foods like muffins, crisps and other were placed in close proximity to the customer, just in front of the till.

## **4.4.2 Structured Observation Findings**

**June 2010**

Visits with structured observational aims were made to St. Aidan's College, St. Mary's, Van Mildert, Collingwood and Grey College. Structured observations were done for method triangulation purposes. Again food was a main theme in observations, especially in terms of healthiness, preparation method and labelling.

The observation studies explored the University initiative to provide students with an informed choice and healthy meals. Nutritional labelling and the traffic light system were observed. Nutritional breakdowns were available only for main meals. Colleges were supposed to print out a full colour information page, so that it was clear which nutritional values were green, yellow or amber red. It is interesting to note that nutritional breakdowns were not complete. No information was available about the carbohydrate and protein values of meals.

Meal breakdowns were not available in all the visited colleges. Occasionally, a variation of these were available, and in one college it was completely misleading. The semi-structured observations confirmed subversions of school guidelines and meal preparation methods. For example, the main meals served at St. Aidan's were served the next day at St. Mary's, however, the nutritional breakdowns were not the same for the same meals. On another occasion, during an observation at Van Mildert College, the nutritional breakdown of a steak was misrepresented. Variations of the nutritional displays were displayed for various reasons.

The result from the observation notes a validation of the widespread availability of meals with predominantly high-fat nutritional values. Most meals appeared to be fried, with students describing them as "dripping in oil", and high in fat. Main meal calories averaged in the 400 kCal, and the fat content exceeded 20 grams and, in some cases 40 grams, of fat. Including side options, salads and dessert included in the meal ticket, the total count came to around 600-1400 calories per meal. During my observations, students did not really seem to be looking at the nutritional information; in some instance this information was not available.

The nutrition that students got, even consuming only the main meals, in terms of dietary fat, was very probably in excess of their daily nutritional requirements. Moreover, the extra calories students got from high fat additions and high sugar desserts made the overprovision of nutrients highly probable.

#### **4.4.3 Additional information**

Full college menus are available in the Appendix together with the nutritional breakdown of the meals, kindly provided by Mr Cohen.

### **4.5 Experimentation Findings**

#### **4.5.1 Café Experiment**

Entertaining message and poster	40.5% (15)
Functional message and poster	21.6% (8)
Celebrity endorsed message/choice	21.6% (8)
Suggestive message	13.5% (5)

\* 37 students provided their feedback and preference for the posters.

Most students confirmed they had noticed the posters, therefore message exposure was accomplished. The Entertaining posters were most liked among the 37 Kingston University students, however, not arguing for representativeness, the experiment provided some insightful information. For example, the messages were well-understood and relevant to the audience. When prompted about their consequent food choices and whether the posters had induced any thoughts or action, few students declared being influenced and having acted upon them, mainly female students. However, most students reacted favourably to the poster initiative.

Students reported being engaged and entertained, in a non-formal way by the Entertainment posters. The Functional and Celebrity campaigns were the second most noticed and liked among students. When prompted what influenced them, students who

have chosen the functional message sometimes reported they were trying to eat healthy. Students who selected the Celebrity theme, were generally not sure of the reasons they had a preference for the poster. Few students mentioned that celebrities motivate them to look like them. The suggestive message was not recognised as healthy eating communication, rather it was considered as an ad aiming to popularise cafeteria items.

#### **4.5.2 Food Choice Experiment**

While not arguing for representativeness in any respect of the student population at Durham University, even so these results can still be useful in planning healthy eating intervention. The results from the experiment should be viewed with caution. Firstly, an important explanation of the variable, “Would change” and “Would not change” (Food choice experiment) might seem odd at first sight. The reason why more students stuck with their initial choice was because it was nutritionally balanced or healthy according to them. For example, these included “soup and salad, with fruit and yogurt”, or “wrap and salad”. The number of students that made healthy choices were significant. Please see Appendix: Food Choice Experiment for more detailed results.

Participants in the experiment can be segmented at least into three groups in terms of healthy eating attitudes and behaviours. The first group was students who made a healthy choice, and were more likely to look at nutritional labelling. The second group was students who demonstrated desire to improve their nutritional intakes, look at labels and reported gaining weight. Lastly, students who were indifferent to dietary recommendations, with rare usage of nutritional labels and who often gained weight after moving to college. However, there was significant difference in students’ the healthiness of food choices. These results might have been due to the small sample or due to other factors. There was no significant relationship between unhealthy food habits and weight gain. Students who reported and made explicit their preference for unhealthy food choices (high fat meals like hamburgers, etc.) also reported not having breakfast, which might compensate for the extra calories, therefore no weight was gained.

# CHAPTER FIVE: DISCUSSION

## **Overview**

This dissertation aims to contribute to the understanding of the phenomenon of healthy eating at Durham University colleges. The combination of explanatory, descriptive and evaluative purposes of the research presents the practical implications for social marketers, managers and policy makers. The research design facilitated the accumulation of breadth of data on various aspects that should be considered for the purpose of designing a favourable healthy eating environment at Durham University Colleges.

In addition, the validity and reliability of hypotheses derived from the literature review in the context of Durham University's college students was tested. Therefore, the findings from this study are not intended to be generally applicable to the wider population of students living at college.

The central proposition of this dissertation is to propose the integration of social marketing frameworks and lessons from communication and consumer behaviour studies for the facilitation of healthy eating behaviours among students. In addition, contributions to consumer decision sciences from economics, psychology, sociology and communication sciences were reviewed.

The results, obtained through the combination of research instruments, allowed the assessment of the current situation by exploring college practices and meal offerings, students' attitudes and practices related to healthy eating in college and the description of various implementation practices. The mixture of qualitative data and quantitative secondary data allows the reader to grasp a comprehensive view of the environment and the behaviours and attitudes of the participants in it. It can be argued that the dissertation is useful as its findings can be used as formative evaluation of the phenomenon and participants in it. Therefore, the research findings have significant value for the practical application of social marketing frameworks and concepts to facilitate aptness to healthy eating behaviours at Durham University colleges.



The upstream orientation of social marketing principles and their application have been addressed primarily with respect to Durham University's capability to influence students' nutritional status for the better through provision of nutritional information and nutritionally balanced meals. Therefore, practices and applications of the university's present action plan were assessed, aiming to improve student's eating experiences at college and enabling them to make educated meal choices. However, the findings are controversial and more work is needed in that direction.

### ***5.1 Discussion of Results***

Findings showed that students varied significantly in terms of their understanding and desire to comply with healthy eating principles. The general notion was that students' predisposition to healthy eating was not positively associated. This was especially true for undergraduate students, who sometimes demonstrated significantly healthier food choices, and despite becoming aware of that (having been provided with information about nutritional characteristics of meals), they still claimed not to be interested in changing their behaviours. These findings can suggest that hedonistic values and rebellious motives might possess significant importance to this group of students, therefore as discussed in the literature review, more salient motivation values should be employed in order to stimulate healthy eating behaviours among these groups.

The lack of a positive attitude to healthy eating was associated positively with poor knowledge of healthy eating principles and disregard of nutritional information. That brings implications for the effectiveness of healthy eating campaigns that employ information as a main tool in facilitating these behaviours. Therefore, this group of students, disengaged from healthy eating practices, should be considered accordingly. Thus, an educational initiatives might be needed to improve the knowledge and understanding of nutrition labelling since those are prerequisites for making educated food choices. While nutrition consciousness positively associated with label reading behaviour, the ease of usage and the correct interpretation of this information, as well as availability of food and social factors, mediated its affects. However, it should be noted that according to previous research (Blaylock et al., 1999) consumer awareness of healthy

eating guidelines is not a sufficient motivator to comply but still positively influences healthy eating and further motivation strategies might be needed.

As regards healthy eating education, or as Contento (2007) describes it “any combination of educational strategies, accompanied by environmental supports, designed to facilitate voluntary adoption of food choices and other food- and nutrition-related behaviors conducive to health and well-being; nutrition education is delivered through multiple venues and involves activities at the individual, community, and policy levels”(Contento, 2007; p.333), healthy eating knowledge should be improved among Durham university students. Raising awareness, however, is not always sufficient to achieve behavioural outcomes. Moreover, although increasing health awareness is of great importance in order to allow individuals to acquire the skills to make healthy eating choices, it is not usually people’s top priority to learn and/or comply with healthy eating principles.

On the other hand, a significant number of students (predominantly female) who demonstrated a desire and made a conscious effort to eat healthily, reported using the nutritional labels often or “sometimes, for reference only”; they demonstrated better healthy eating knowledge and better food choices, which is consistent with findings elsewhere (Misra, 2007). For these health conscious students, however, a major impediment to eating healthily was the quality of the meal offering. Additionally, college meals, being nutritionally analysed by experts, were notably high in fat. These findings were triangulated. Through cross-checking data from focus group accounts, observations and expert opinion, the validity of results was strengthened.

Additionally, students reported that nutritional information throughout colleges might not have sufficiently facilitated their efforts to make healthy choices. Not only the readability of information but also inconsistency and inaccuracy at times may have contributed further to the ignorance most students reported towards the traffic light system and nutritional data available to them.

Yet the prevailing food items in college menus throughout Durham Colleges send “at best, a missed opportunity, and, at worst, a direct threat to the health of the students” (McGinnis & Gootman, 2006, p. 257). Through the nutritional analysis of students’

meals, it was found that by consuming the main meals alone, it is highly probable that students exceeded their daily nutritional requirements. Often, only the main meal provided one-third of the daily caloric requirements of the male or female student doing the experiment.

Additionally, the balance of nutrients was with significantly high values in respect to dietary fat. It should be taken into consideration that the main meals are only part of everything that students usually consume, and observation study confirms that most students have side options, salads and desserts with their main meals. It was suggested that food additions, such as French fries, mayonnaise, pasta salads and desserts, should be considered if a healthy menu is a priority. The implications for the long-term of such dietary practices can be huge. As demonstrated earlier, by constantly exceeding your daily caloric requirements by only 50 calories, which is equal to one apple, half a portion yogurt, students can significantly increase their weight. Weight gain was frequently reported among male and female students, consistent with previous studies on student populations (Levitsky et al., 2004; Anderson, Shapiro & Lungreen, 2003; Hoffman et al., 2006; Pliner & Saunders, 2008; Racette et al., 2008).

Moreover, a number of aspects should be considered when targeting communication messages to adolescent and young adult segments of the population. Among these, young people's motivation to adopt behaviours which bring immediate gratification (Fawcett, 2000; Mixon, 2001), health benefits not being of high priority (Goldman and Glantz, 1998), a shift from negative to more positive health consequences (set of benefits) of a healthy diet and positive motivational messages for healthy eating (Mixon, 2001). Health promotion campaigns have learned to overcome these communication barriers borrowing from branding and advertising disciplines to improve healthy eating behaviours.

“Branding provides a mechanism to increase the salience and perceived value of the target behaviour in the mind of the consumer. It reminds us that our target audience is comprised of authentic choice makers who have to balance numerous competing priorities in a world of limited time and resources. It also reminds us that if we expect our target audience to “buy-in” to our products, we not only have to effectively promote a desirable package through carefully selected outlets, we also have to provide it at a

recognizable and realistic cost that offers a solution to our audience's needs." (Wardle 2001, p.28)

Most of the students preferred the entertaining nutritional poster, and reported being entertained when noticing it. Some students also reported talking about it with friends and cafeteria staff. Therefore, nutritional posters that are entertaining might be more interesting to students, simultaneously educating them and/or eliciting healthy eating behaviours.

The motivators, enablers, and barriers found through this study provide indication that a number of factors affecting healthy eating behaviours of students (see Appendix Healthy Eating Determinants) can potentially be modified so that they provide the optimal nutrition of each and every student according to nutritional needs. Durham University's Catering Strategy has the potential to influence students' behaviours at large by implement various healthy eating promotion strategies. One of these could be improving of meal offering, since that was a significant finding from the research indicated as a main barrier to eating healthy. Developing environmental interventions, where students at large will be targeted might present a realistic aim for Durham University's administration. As Contento (2007) emphasizes, physical environments, as well as policy and social structures, should be incorporated in addition to skills and the personal motivation necessary for "behavior change or outcome-based interventions" (p. 333). Therefore, modifying factors in the environments where individual behaviours occur is a reasonable implication for healthy eating interventions aiming to improve the nutritional quality of food choices. As a result, differences of individuals' knowledge and intention (desire) to eat healthily have less influence and might have reasonable potential to influence even individuals at large (Desire to Eat Healthy & Healthy Eating Knowledge) if implemented properly (Wechsler et al., 2000; Hilder, 2001). Providing more nutritionally balanced meals through college meals would have an impact on nutritional intake in populations independent of individual characteristics. This is consistent with studies measuring the influence of contextual variables from the food environment (Popkin et al., 2005; Wansink, 2004; Wansink & Sobal, 2007; Lowe et al., 2009; Gordon et al., 2006).

## **5.2 Recommendations for the College Management**

1. College menus should be suited to meet nutritional standards as well as students' explicit preferences. These would be meal options low in dietary fat, added sugars and overall calories.
2. Improve consistency and signage of nutritional labelling across colleges. Provide educational curricular to introduce catering strategies and the traffic light system. Promote the 5-a-day servings of fruit and vegetables.
3. For example the availability of Snack foods throughout the campus for example can be reconsidered and new healthier snack foods to be offered. Also, rearrangement of food presentation in accordance with latest research (Wansink, 2010, 2006, 2005, 1996; Wansink et al., 2004).
4. Layout and food presentation can be greatly improved and modified to optimally benefit to healthy eating choices among students (Wansink, 2010, 2006, 2004, 2005, 1996; Wansink et al., 2004, 2008). Making available more or only health food offering available as Wansink and colleagues suggest(2004), or introducing more choices of healthful and low-fat meal options and limiting the number of high-energy densed food items or limiting their availability through separate purchase counters. Many different combinations are possible and the head of catering team at Durham University, Shona Millar has showed a great interest in experimenting with these in the future.
5. Changing snack prices can encourage healthier choices by introducing price incentive towards healthy snack options like high fibre, low-fat snacks and having increase of price of high-fat energy densed foods (Sustein & Thaler, 2008; Wansink et al., 2008; Drewnowski & Rolls, 2005, French, 2001).
6. Change of the prepaid college meal plans, for example excluding unhealthy foods and deserts as part of the pre-paid menu plan but still available to purchase for an extra price. This increased effort and absence of commitment (prepaying for an item), as explained by Thaler and Sustein (2008) would not increase the link

between intention and behaviour, but the opposite. It would present a greater effort to perform behaviour.

### **5.3 Changing the Behaviour of Individual Students**

1. Students' attitudes and knowledge of healthy eating principles differs significantly, therefore environmental interventions could prove to be most suitable in improving their nutritional uptakes.
2. Students were generally not motivated by the long-term health benefits associated with healthy eating. However, the general notion was that they were not always aware of the benefits and disadvantages of healthy and unhealthy eating behaviours. Therefore, the educational curriculum should also be considered in order to improve understanding of nutrition principles and their benefits to health.
3. Additionally, healthy eating programmes should be more focused on providing shorter-term benefits to younger individuals in order to engage them.
4. Hedonic motives were predominant among the student sample in the study, therefore new recipes might be developed with reduced caloric and fat contents to accommodate these particular groups of students.
5. Targeting social environments, rather than individual behaviours might increase the value of healthy eating behaviours, making them socially desirable among their peer groups.
6. Students showed considerable liking for entertaining nutritional posters, therefore this might be an opportunity to reach individuals who would not be influenced otherwise. To successfully incorporate a healthy eating communication campaigns in Durham University, it would be necessary to link perceptual experiences and cognitive processes to the broader social context of students live via semiotic approach to visual consumption.

## **5.4 Recommendations for Further Research**

1. Suitable study designs for further research would be ethnographic studies that capture students' living and eating experiences in college in a more detailed and at the same time broader terms. Capturing the social, environmental and interpersonal influences involved in food choice behaviours would be insightful for refining public health, social marketers' and college programmes.
2. Conducting observational studies and experimenting with contextual variables while tracking student intakes would be natural continuation of the research.
3. Developing research methods which would allow the better understanding of students' reasoning for meal choices, such as accompanying students while making their meal choices. Quite an insightful technique from conventional marketing.
4. The highly salient core values that most people hold can be further explored and tested in order to reflect the target audiences' self-interest and increase chances of successful interventions.
5. It would also be interesting to observe if the respondents at Durham University would react similarly to the entertainment nutrition posters and thus make healthier choices.
6. Practical and legal issues may also pose obstacles to put into practice some of these strategies. As such, an important area for research would be to design experiments and pilot programs to measure the effectiveness, cost, legality, and practicability of these opportunities.

**Appendix: Observation Notes- Meal Breakdowns**  
**Nutritional Characteristics of meals served in Colleges (per portion).**

<u>Grey College – lunch</u>	<u>Calories</u>	<u>Fat (g.)</u>	<u>Sat.Fat(g.)</u>	<u>Sugar (g.)</u>	<u>Salt (g.)</u>
Beef Burger Salsa		42g.			
Smoked Haddock Cake		28g.			
Lime Chilli Chicken Noodles		10g.			
<b><u>Dinner</u></b>					
Mexican Layer Bake		21g.			
Bacon Cutlet and Grilled Tomato		2.4g.			
Pea & Herb Risotto		21g.			

No further nutritional information was obtained.

These quantities of fat are per portion for the main meals only. vSignificantly high fat values.

<u>Lunch (Second Visit )</u>	<u>Calories</u>	<u>Fat (g.)</u>	<u>Sat.Fat(g.)</u>	<u>Sugar (g.)</u>	<u>Salt (g.)</u>
Cheese & Ham Panini					
Beef Steak					
Pork Toulouse					
<b><u>Dinner (Second Visit )</u></b>					
Turkey & Ham Pie					
Polenta with grilled vegetables					

No nutritional information was available.  
The video screen was not on.



<b><u>St. Mary's College – lunch</u></b>	<b><u>Calories</u></b>	<b><u>Fat (g.)</u></b>	<b><u>Sat.Fat(g.)</u></b>	<b><u>Sugar(g.)</u></b>	<b><u>Salt(g.)</u></b>
Pork Fajita	-	64.3	34.3	4.4	1.4
Mushroom & Smoked Bacon Pasta	-	39	14	27	2.8
Vegetable Brochette	-	8.4	4	1.4	-

Note. No information about carbohydrates, protein and total calories values were obtained because information was collected at the serving counter where such information was not available. Complete nutritional breakdown was not available.

<b><u>St. Aidan's College – lunch</u></b>	<b><u>Calories</u></b>	<b><u>Fat (g.)</u></b>	<b><u>Sat.Fat(g.)</u></b>	<b><u>Sugar(g.)</u></b>	<b><u>Salt(g.)</u></b>
Pork Fajita	421	64.3	34.3	-	-
Mushroom & Smoked Bacon Pasta	876	39	17	37	-
Vegetable Brochette	-	-	-	-	-
<b><u>Dinner</u></b>					
Beef & Ale Filled York. Pie	534	18.7	5	14	-
Honey Eye Chicken	425	7	-	42	-
Gnocchi w. Pine nuts Pesto Cream	403	26	10	1.7	-

<u>Collingwood College - dinner</u>	<u>Calories</u>	<u>Fat (g.)</u>	<u>Sat.Fat(g.)</u>	<u>Sugar(g.)</u>	<u>Salt(g.)</u>
Burger/Veggie Burger	No nutritional information was available during my visit.				
French Fries					
<b><u>Dinner (Second Visit)</u></b>					
Hot Dogs	No nutritional information was available during second visit.				
Honey Mustard Turkey					
Mince Dumplings					

**Appendix: Sample Caloric Breakdown Of College Main Meals.**

<b>Vegetable Cutlet Tomato Relish</b>			
<b>Dietary Analysis</b>			
<b>Fat</b>	<b>Saturated Fat</b>	<b>Salt</b>	<b>Sugar</b>
<b>6.9</b>	<b>1.3</b>	<b>1.9</b>	<b>5.9</b>
<b>Calories per average portion</b>			
♂	437	♀	437
<b>% daily amount*</b>			
♂	17.5	♀	21.8
<b>Worked out per</b>		<b>257</b>	<b>g serving</b>

<b>Turkey Pesto Roasted Veg Flatbread</b>			
<b>Dietary Analysis</b>			
<b>Fat</b>	<b>Saturated Fat</b>	<b>Salt</b>	<b>Sugar</b>
<b>21.9</b>	<b>11.9</b>	<b>2.8</b>	<b>7.8</b>
<b>Calories per average portion</b>			
♂	580	♀	580
<b>% daily amount*</b>			
♂	23.2	♀	29.0
<b>Worked out per</b>		<b>372</b>	<b>g serving</b>

<b>Tortellini</b>			
<b>Dietary Analysis</b>			
<b>Fat</b>	<b>Saturated Fat</b>	<b>Salt</b>	<b>Sugar</b>
<b>26.4</b>	<b>3.9</b>	<b>1.4</b>	<b>7.5</b>
<b>Calories per average portion</b>			
♂	348	♀	348
<b>% daily amount*</b>			
♂	13.9	♀	17.4
<b>Worked out per</b>		<b>278</b>	<b>g serving</b>

<b>Steak and Mushroom with Puff Pastry</b>			
<b>Dietary Analysis</b>			
<b>Fat</b>	<b>Saturated Fat</b>	<b>Salt</b>	<b>Sugar</b>
<b>19.8</b>	<b>8.8</b>	<b>2.0</b>	<b>3.5</b>
<b>Calories per average portion</b>			
♂	406	♀	406
<b>% daily amount*</b>			
♂	16.2	♀	20.3
<b>Worked out per</b>		<b>267</b>	<b>g serving</b>

Spring Chicken Casserole			
Dietary Analysis			
Fat	Saturated Fat	Salt	Sugar
2.5	0.3	1.6	9.7
Calories per average portion			
♂	178	♀	178
% daily amount*			
♂	7.1	♀	8.9
<i>Worked out per</i>		<b>312</b>	<i>g serving</i>

Smokey Chicken Breast			
Dietary Analysis			
Fat	Saturated Fat	Salt	Sugar
3.2	0.7	0.4	0.5
Calories per average portion			
♂	196	♀	196
% daily amount*			
♂	7.9	♀	9.8
<i>Worked out per</i>		<b>177</b>	<i>g serving</i>

Garlic and Ginger Pork Cutlet			
Dietary Analysis			
Fat	Saturated Fat	Salt	Sugar
35.3	11.1	0.5	0.0
Calories per average portion			
♂	455	♀	455
% daily amount*			
♂	18.2	♀	22.8
<i>Worked out per</i>		<b>182</b>	<i>g serving</i>

Blackened Salmon			
Dietary Analysis			
Fat	Saturated Fat	Salt	Sugar
19.8	3.3	0.3	0.0
Calories per average portion			
♂	317	♀	317
% daily amount*			
♂	12.7	♀	15.8
<i>Worked out per</i>		<b>175</b>	<i>g serving</i>

Most meals available during observations were with significantly higher values of fat and sugar.

## Appendix: Catering Survey 2009 – Quantitative Research

The catering survey was used to cross-check findings, a representative sample of 700 students. Below are the data which were cross-checked with students' accounts from focus groups regarding their satisfaction with the food offering, quality and variety of food.

Durham, 18<sup>th</sup> November to 1<sup>st</sup> December 2009

There were two types of ratings. The first group of questions assessed the satisfaction, and the second the perceived improvement of rated variables.

<u>Group 1</u>		<u>Group 2</u>	
Excellent	- 100	Highly Improved	- 100
Good	- 80	Improved	- 75
Average	- 60	The Same	- 50
Poor	- 40	Worse	- 25
Very	- 20		

### Overall Satisfaction

Students rated the food offering at their college 'Average', at average 74.9.

### Variety of Food Offering

Fresh fruit rated 66.1

Cereals at 73.5 'Average'

Other breakfast items 80.6 or 'Good'

Friday 'Theme Nights' 77.0 'Average'.

Hot and Deli Counter 73.8 and 71.9 'Average'.

Salads, Soups & Accompaniments, rated respectively at 77.1 and 73.1 or 'Average'.

### **Comparisons to Last Year**

Food Quality compared to last year was also rated slightly 'Improved' (75.4).

### **Quality Of Food**

Mean rating for quality of food in college was rated as 'Average' (72.7).

### **Food Information**

Availability of menu information 'Average' (77.1)

Description of dishes identified on wall menus 'Average' (76.0)

### **Overall Ratings**

Colleges' mean ratings were 'Average' (72.3)

## Appendix: Food Choice Experiment Results

<b>Experiment with food choice</b>
Students were asked if they regularly attend college breakfast, lunches and dinners. If the answer was positive they qualified for the experiment.
The foods they could choose were selected from a college menu.
They were asked if they could tell approximately the total caloric value of the foods they have chosen, their daily nutritional requirements, and were immediately after that informed about the average nutritional requirements for the day according to activity levels and their current weight (caloric requirements to maintain weight formula according to <b>Harris Benedict Formula</b> ). Formula is provided in Appendixes in the end.
Pre Test: Students were asked to identify the foods they would normally choose as preferred meal from
Condition Treatment: They were informed about the average calories those meals and grams of fat, and
Post Test: Students were asked whether they would change their mind if they knew in advance the caloric value of their choice.
The sample included 23 students from the major colleges in Durham, including St Mary's, Trevelyan, Grey, St. Aidan's and Collingwood.
Respondent 1: Asian, female, Colindale, undergraduate
Fruit and yogurt, salad, chicken and stir-fry noodles (Total calories were in the range)
Would not change mind
Would not use software for reference
Not tempted to eat unhealthy, strictly sticking to her normal diet,
Not health conscious
Respondent 2 St John's College, white, male, undergraduate, sport person
Hamburger and fries, salad, cake (Total calories were over requirements)
<b>Would change his mind</b> , would not use software for reference

<p>Tempted to eat unhealthy,</p>
<p>Not so much concerned with healthy eating</p>
<p>Respondent 3 Mary's White, female, undergraduate</p>
<p>Hamburger, salad, creamy soup, cinnamon swirl (Total calories were over requirements)</p>
<p>Would change her mind,</p>
<p>May use the software but not on regular basis</p>
<p>Tempted to eat unhealthy,</p>
<p>Not health conscious</p>
<p>Respondent 4 Mary's White, female, graduate, sport person</p>
<p>Salad, stir-fry noodle, salmon, fruit and yogurt (Total calories were over requirements)</p>
<p>Would not change her mind,</p>
<p>Would use the software for reference but not regularly</p>
<p>Tempted to eat unhealthy,</p>
<p>Definitely trying to eat healthy</p>
<p>Respondent 5 Mary's white, female, undergraduate</p>
<p>Wrap, fruit and yogurt, lentil soup (Total calories were over requirements)</p>
<p>Would change.</p>
<p>Might use software for reference</p>
<p>Tempted to eat unhealthy,</p>
<p>Not so much concerned with healthy eating</p>
<p>Respondent 6 Mary's, white, female, undergraduate</p>



Hamburger, fruit and yogurt, coriander soup (Total calories were over requirements)
Would change option,
Would not use software
Tempted to eat unhealthy,
Not health conscious
Respondent 7 Mary's, white, female, undergraduate
Soup, fruit and yogurt, cinnamon swirl (Total calories were in the range)
Would not change option,
Would not use software
Tempted to eat unhealthy,
Not so much concerned with healthy eating
Respondent 8 Mary's white, female, undergraduate
Wrap, fruit and yogurt and salad, veg. noodles (Total calories were over requirements)
Would change option,
Would not use software
Tempted to eat unhealthy
Not so much concerned with healthy eating
Respondent 9 Grey, white, female, undergraduate
Wrap and dessert (yogurt & fruit or pastry) (Total calories were slightly over requirements)
Would not change option,
Would not use software
Tempted to eat unhealthy,
Not health conscious

Respondent 10 Grey, white, female, undergraduate
Stir-fry option and dessert. (Total calories were with in requirements)
Would not change option,
Would use software
Tempted to eat unhealthy,
Not health conscious
Respondent 11 Grey, white, female, undergraduate
Wrap, coriander soup, brownie (Total calories were with in requirements)
Would not change option, would not use software
Tempted to eat unhealthy,
Not health conscious
Respondent 12 Grey, white, male, undergraduate
Creamy soup, salmon, cinnamon roll (Total calories were over requirements)
Would change, would not use software on regular basis
Tempted to eat unhealthy,
Not health conscious
Respondent 13 Grey, white, male, undergraduate
Creamy soup, wrap, brownie (Total calories were over requirements)
Would change, would not use software.
Tempted to eat unhealthy,
Not health conscious
Respondent 14 Grey, white, female, undergraduate

Stir-fry main, wedges, brownie (Total calories were over requirements)
Would change option,
Would not use software
Tempted to eat unhealthy
Not health conscious
Respondent 15 Grey, white, male, undergraduate
Creamy soup, Cantonese chicken, fruit and yogurt (Total calories were over requirements)
Would not change,
No software
Tempted to eat unhealthy,
Not health conscious
Respondent 16 Grey, white, female, undergraduate
Tomato soup, wrap, fruit and yogurt (Total calories were over requirements)
Would change,
Would use software
Tempted to eat unhealthy sometimes
Not so much concerned with healthy eating
Respondent 17 Grey, white, female, undergraduate
Wrap, apple and yogurt and wedges (Total calories were with in requirements)
No change,
Might use software
Tempted to eat unhealthy,
Not health conscious

Respondent 18 Grey, white, female, undergraduate
Salmon, salad, fruit (Total calories were with in requirements)
Would not change,
No software, maybe just to see what is it
Tempted to eat unhealthy,
Not so much concerned with healthy eating
Respondent 19 Grey, white, male, undergraduate
Stir-fry veg. Salmon, brownie (Total calories were over requirements)
No change, would use software
Tempted to eat unhealthy.
Not health conscious
Respondent 20 Grey, white, female, undergraduate
Chips and hamburger, yogurt and fruit (Total calories were over requirements)
Would change,
Would not use software,
Tempted to eat unhealthy,
Not health conscious
Respondent 21 Grey, white, female, undergraduate
Fish, sweet potato soup, cake (Total calories were over requirements)
Would change because of dessert
Would use software as reference but not regularly
Tempted to eat unhealthy

Not health conscious
Respondent 22 Grey, white, female, undergraduate
Salmon, potato soup, cake (Total calories were over requirements)
Would change because of dessert,
Would not use software
Tempted to eat unhealthy
Not health conscious
Respondent 23 Grey, white, female, undergraduate
Wrap, tomato soup, cake (Total calories were with in requirements)
Would change, no cake
No software
Eats what she likes,
Not tempted
Definitely trying to eat healthy
<b>Results:</b>
<b>Food Choice- Change/ No change</b>
(13) Would change choice of they knew more, (10) Would not change options Some of the would not change responses are due to initial healthy/ low calories option chosen.
<b>Software usage:</b>
(8) Might use it as a reference/ of 23 (35%)

<b>Health conscious:</b>
Not trying to eat healthy (15) 65%
Not so much into eat healthy (6) 26%
Definitely trying to eat healthy (2) 9%
<b>Tempted to eat more or unhealthy by the foods in the college menu offering</b>
(21 or 91%) Admit being tempted to overeat or make unhealthy options. Only six of them reported trying to eat somehow healthy, two of them definitely trying to eat healthy.
(2 or 9%) Were not tempted to by the menu offering, only one reported being health eating conscious

***Additional comments:***

None of the students has chosen pasta dishes or omelette as their option, which is consistent with focus group findings about pasta quality and preparation method.

Some of the most often cited explanations to the question why they were tempted were due to food availability (most often regarding desserts). They would not normally eat dessert every they, “but since we have already paid for it, why not having it.” Additional explanation provided was that the variety of food lead most of them into temptation. Even the students that were trying consciously to eat healthy, and who demonstrated understanding of nutrition (calorie requirements and being able to identify healthy food options) also admit being tempted to eat foods they would not normally eat, and additionally reported overeating regularly (feeling heavy, eating too much).

Third, most often cited reason, for making unhealthy choices, also consistent with focus group findings was due to social influence. Students would not normally eat those foods but since most of their friends did so do they. Additionally, the occasional nights out, associated with drinking alcohol, was very much associated with eating late at night and consuming high fat foods. Lastly, the Sunday Lunch, being not liked by the greatest part of students who participated in both the experiment and the focus group.

The majority of students who took part in the experiment, claimed not to be trying to consciously eat healthy. The reasons most often were that they do not have particular health problem which bothers them and they were much more guided by their food and taste preferences, rather that healthy eating principles. What was really interesting is that many students used expressions like “I don’t care” to express their opinion about healthy eating, and did not seem to feel uncomfortable with

## Appendix: Caloric Needs Formula

### Harris Benedict Formula

To determine your total daily calorie needs, multiply your [BMR](#) by the appropriate activity factor, as follows:

1. If you are sedentary (little or no exercise) : Calorie-Calculation =  $BMR \times 1.2$
2. If you are lightly active (light exercise/sports 1-3 days/week) : Calorie-Calculation =  $BMR \times 1.375$
3. If you are moderatetely active (moderate exercise/sports 3-5 days/week) : Calorie-Calculation =  $BMR \times 1.55$
4. If you are very active (hard exercise/sports 6-7 days a week) : Calorie-Calculation =  $BMR \times 1.725$
5. If you are extra active (very hard exercise/sports & physical job or 2x training) : Calorie-Calculation =  $BMR \times 1.9$

## **Appendix: Carolyn Summerbell Interview**

(Answered by O'Malley, September 2009)

“I believe that students lack awareness, they have other issues to deal with (exam stress, moving away from home, etc.) and eating healthily may not be a priority. Likewise, they may simply lack the knowledge of what actually constitutes a healthy diet.

I think it is important to ensure students are aware of what constitutes a healthy diet and the impact it may have on their learning experience. I am unaware to what extent this information is provided/given to Durham students but believe that it should definitely be included in some form or another. The menu analysis work which is currently underway is a step forward in ensuring that students are fully aware of what is on offer in the college canteens and to provide them with the information which will allow them to make an informed choice.

I believe the most effective methods are those which allow people to make an informed decision (which is their own) based upon knowledge and facts. Using FSA guidelines to display the nutritional content of food allows Durham University students to do this, and is a step forward in raising awareness of a healthy diet.

In the near future it is hoped that this information will be displayed for all dishes served within all Durham University canteens.“

### **On Portion Sizes:**

“Portion sizes can be an issue and this information needs to be more readily available. People generally tend to underestimate portion sizes and this can be difficult to ascertain particularly as the majority of restaurants (mainly well known chains) serve very large portion sizes. If a person were to eat at these places on a regular basis, their perception of what constitutes a portion size can become distorted and energy intake will quickly exceed energy expenditure. Students are particularly susceptible to falling into this trap, living away from home and eating convenience foods. This is why it is important for an informed labeling system to be displayed within student canteens.”



## **Appendix: Ricky Cohen, Notes From The Interview June 2010**

During our initial conversation Mr Cohen said that a cooked/fried breakfast could be healthy, if the preparation method is right. I asked him to give me an example, and he gave me an example with ‘Sausage, Beans and Hashbrowns’ and I requested to see the nutritional breakdown, since I could not possibly believe that. At first sight it really seemed relatively green, with 3 green lights and 1 red. Looking closely, the green signs were for the sugars, salt and protein, the red one for fat: 26 grams. I wondered if that was his profound judgement for a healthy cooked breakfast.

Mr Cohen showed me the additional feedback of students from the Catering Survey in the form of an Excel spreadsheet. This data clearly contained almost identical comments from students regarding the College Catering. However, students were mainly expressing their dissatisfaction with the “high fat meals”, “incorrect nutrition labels”, “too much fried foods”.

## **Appendix : Focus Groups Codes And Themes**

Since Moving to College: (mentioned in all groups as a barrier to eat healthy).

Difficulty keeping weight off.

Social influencers to eat unhealthy.

Tempted to Eat Unhealthy.

Food Availability: (mentioned in all groups as a barrier to eat healthy).

Do not like college food

High fat food, mentioned systematically in students accounts

Unhealthy food "high fat food", "dripping in oil" "a good variety of fried and oily food high in calories"

Less food for lunch "lunch is heavy, feel sleepy after that"

Sunday Roast "heavy and sludgy", "hate it", "no one i know likes it" "we usually order pizza rather than eating the Sunday roast."

Food Preparation: (mentioned in all groups as a barrier to eat healthy).

Need for Improved recipes: "more low fat options", "dry meat or too oily"

Salad bar liked.

Food Quality: (mentioned in all groups as a barrier to eat healthy).

Food Quality Improved (from before) "not only chips and pizza"

" more healthy options", "more light options", "less fried food" "more salads".

Food Labeling: (mentioned in some groups as a barrier to eat healthy).

Need for Improved Visibility of Labeling- "hardly visible" "missing most of the time"

Need for Improved Labeling – often described as "Confusing"-

Label Usage: "As reference" "don't eat all red options"

DO NOT Use Labeling TLS, "Don't look at calories but don't eat all red foods", a number of students claimed not using the labels at all.

Eating attitudes and behaviours:

Eating Healthy: few students claimed to do so.

Healthy Eating Awareness was low.

Desire to eat healthy was also low.

High-risk Groups Identified:

Eating Unhealthy, often students admitted doing so.

Not trying to eat healthy- most students.

Low Healthy Eating Awareness- significant part of students.

Appendix: Nutritional Posters

*Functional Posters:*

**More filling!!!**  
**Less Calories!!!**



\*Low-Fat  
\*\*High Fibre Option

**Hearty Soup &**  
**Light Salad =**  
**Filling Lunch Less**  
**Calories**

**From £3.20**



*Entertainment Posters:*

**Have you experienced  
serious salad envy?**



*"Between soup and love, the first is better."*

**Souplove**



**Suggestive Posters:**



## Fresh Daily-Made Soups

With bread roll. . . **£ 1.70**

**£ 1.30**



***Celebrity Endorsed Poster:***

“Because Healthy Is Sexy”

Kim Kardashian



## References:

- 1.ABC Australia, Jamie Oliver (2006) "*Enough Rope with Andrew Denton episode 121*". Available from <http://www.abc.net.au/tv/enoughrope/transcripts/s1743226.htm> (Accessed on 12/02/2010)
- 2.Adam Drewnowski and Barbara J. Rolls (2005) *How to Modify the Food Environment*, Journal of Nutrition, 135/4, 898-899.
- 3.Adler and Adler (1994) p.398 in Denzin and Lincoln, 2005
- 4.Adolphs, R. (2003) *Cognitive neuroscience of human social behaviour*, National Review in Neuroscience 4, pp. 165–178. From Motivating forces of human actions: Neuroimaging reward and social interaction
- 5.Ajzen I. (1991) *The theory of planned behavior*. Organizational Behavior Human Decision Process. 50:179-211.
- 6.Ajzen, I (1985) *From intentions to actions: A theory of planned behavior*. In J. Kuhl & J. Beckman (Eds.), Action-control: From cognition to behavior (pp. 11–39).
- 7.Heidelberg, Germany: Springer. Retrieved November 1, 2007, from <http://www.people.umass.edu/aizen/publications.html> Icek Ajzen Selected Publications.
- 8.Ajzen, I (1991) *The theory of planned behavior, Organizational Behavior and Human Decision Processes* 50, pp. 179–211.
- 9.Ajzen, I., & Fishbein, M. (1980) *Understanding attitudes and predicting behaviour*. Englewood Cliffs, NJ: Prentice Hall.
- 10.Allan, J. L., Johnston, M., & Campbell, N. (in press). *Missed by an inch or a mile? Predicting size of intention-behaviour gap from measures of executive control*. Psychology & Health.
- 11.Ammerman A, Lindquist C, Hersey J. (2001) *Efficacy of interventions to modify dietary behavior related to cancer risk*. Evidence Report/Technology Assessment No. 25 (Contract No. 290-97-0011 to the Research Triangle Institute-University of North Carolina at Chapel Hill Evidence-based Practice Center), AHRQ Publication No. 01-E029. Rockville, MD.
- 12.Anand, S.S., (2006) *Obesity: the emerging cost of economic prosperity*. 175(9):1081.
- 13.Anderson S.A. et al., 2008 *NHS*, Health Scotland
- 14.Anderson, D., Shapiro, J., Lungren, J. (2003) *The freshman year of college as a*
- 15.Andreasen, A. (2006). *Social marketing in the 21st century*. Thousand Oaks, CA: Sage.  
Andreasen, A. (1995). *Marketing social change: Changing behavior to promote health, social development, and the environment*. San Francisco: Jossey-Bass.



16. Armstrong, B., Doll, R., (1975) *Environmental factors and cancer incidence and mortality in different countries, with special reference to dietary practices*. International Journal of Cancer, 1975, 15:617—631.
17. Arnold, D. (1994) *The Handbook of Brand Management*, Century Business-The Economist Books 1993, McGraw-Hill Doyle, Peter, Marketing Management and Strategy,
18. Aron, Jacqueline I., Evans, Rhian E., Mela, David J. (1995) *Paradoxical effect of a nutrition labelling scheme in a student cafeteria*. Nutrition Research, Volume 15, Issue 9, September 1995, Pages 1251-1261.
19. Asbury et al (2008) *Campaign: Applying a Branding Strategy in Public Health*, American Journal of Preventive Medicine, Volume 34, Issue 6, Supplement 1, June 2008, Pages S183-S187.
20. Bagust et al (1999) *The additional cost of obesity to the health service and the potential for resource savings from effective interventions*, European Journal of Public Health, December 1999; 9: 258 - 264.
21. Bandura A. (1986) *Social Foundations of Thought and Action*. Englewood Cliffs, NJ: Prentice-Hall;
22. Baranowski et al (1997) *Theory as mediating variables: Why aren't community interventions working as desired?* Annual Epidemiology. 1997; 7 (suppl):S89-S95.
23. Baranowski et al (1999) *Psychosocial correlates of dietary intake: advancing dietary intervention*, Annual Review of Nutrition 19, pp. 17–40.
24. Baranowski et al (2003) *Are current health behavior change models helpful in guiding prevention of weight gain efforts?* Obesity Research, 11(suppl):23S-43S.
25. Bem, D. J. (1970). *Beliefs, attitudes and human affairs*. Belmont, CA: Brooks/Cole.
26. Bem, D. J. (1972). *Self-perception theory*. In L. Berkowitz (Ed.). *Advances in experimental Social Psychology* (Vol. 6, pp. 1–62). New York: Academic Press.
27. Benjamin, L. C., Rodolfo, M. N. Jr. , Andres, S., and John, L. P. (2009) *Do the National School Lunch and School Breakfast Programs Improve Children's Dietary Quality?*
28. Birch, L. (1999) *Development of food preferences*, Annual Review of Nutrition 19, pp. 41–62.
29. Blaylock, J., Smallwood, D., Kassel, K., Variyam, J., & Aldrich, L. (1999). *Economics, food choices, and nutrition*. Food Policy, 24, 269e286.
30. Blake, C.E., C.A. Bisogni, J. Sobal, C.M. Devine, M. Jastran (2007) *Classifying foods in contexts: How adults categorize foods for different eating settings* Appetite, Volume 49, Issue 2, Pages 500-510.

31. Bradburn, N. M., et al. (2004). *Asking questions: the definitive guide to questionnaire design--for market research, political polls, and social and health questionnaires*. San Francisco, Jossey-Bass.
32. Briggs, (2008) accessed at: <http://news.bbc.co.uk/1/hi/sci/tech/7250608.stm> on January 10th, 2010.
33. Broadbend, S., Burnett, L. (1989) *Advertising Budget* p.73-84.
34. Brothers, L., (1990) *The social brain: a project for integrating primate behavior and neurophysiology in a new domain*, Concepts in Neuroscience 1, pp. 27–51.
35. Brunstrom, J. M., & Shakeshaft, N. G. (2009). *Measuring affective (liking) and non effective (expected satiety) determinants of portion size and food reward*. *Appetite*, 52(1), 108–114.
36. Bryman A., (2008) *Social Research Methods* OUP Oxford; 3 edition
37. Buchanan, D. (2004) *Two Models for Defining the Relationship between Theory and Practice in Nutrition Education: Is the Scientific Method Meeting Our Needs?* *J Nutritional Education Behaviour*. 36:146-154.
38. Butler et al (2004) *Change in diet, physical activity and body weight in female college freshman*. *American Journal of Health Behavior*, 28:24-32.
39. Campbell TC, Junshi C. *Diet and chronic degenerative diseases: perspectives*
40. Campbell TC, Parpia B, Chen J. *Diet, lifestyle, and the etiology of coronary artery*
41. Carol M. Devine (2005) *A Life Course Perspective: Understanding Food Choices in Time, Social Location, and History*, *Journal of Nutrition Education and Behavior*, Volume 37, Issue 3, May-June 2005, Pages 121-128.
42. Carson, J.A.S, Hedl, J.J. (1998) *Smart shoppers tours: outcome evaluation*. *Journal of*
43. CDC (2006) - *CDCynergy (NCHM)*. Centers for Disease Control and Prevention. Retrieved on 2007-10-19, <http://www.cdc.gov/healthmarketing/cdcynergy/>
44. Cheng, T. C. (2003) *It is not what you eat, but how much you eat, that makes you fat* *International Journal of Cardiology*, Volume 122, Issue 1, Pages 64-65.
45. Cheng, T.O. (2007) *It is not what you eat, but how much you eat, that makes you fat* *Department of Medicine, The George Washington University International Journal of Cardiology* 122 (2007) 64–65.
46. Church S. (2008) *Trends in portion sizes in the UK - a preliminary review of published information*. Report to the Food Standards Agency
47. Cluskey, M., Grobe, D., (2009) *College Weight Gain and Behavior Transitions: Male and Female Differences*, *Journal of American Dietary Association*; 109:325-329.

48. Colapinto C K, Fitzgerald A, Taper LJ, Veugelers PJ. (2007) *Children's Preference for Large Portions: Prevalence, Determinants, and Consequences*. J Am Diet Assoc. 2007, 107:1183-1190.
49. Conner et al (2002) *The theory of planned behavior and healthy eating*, Health Psychology 21 (2), pp. 194–201.
50. Constante, P., Lock, K., (2009) *Do school based food and nutrition policies improve diet and reduce obesity?* Preventive Medicine, Volume 48, Issue 1, January 2009, Pages 45-53.
51. Cotton, Jacqui R., Blundell, John E. (1994) *Dietary Fat, Food Habits and Appetite*, Nutrition & Food Science, Vol. 94 Iss: 6, pp.4 – 9.
52. Cousineau et al (2006) *Web-based nutrition education for college students: Is it feasible?* Evaluation and Program Planning, Volume 29, Issue 1, February 2006, Pages 23-33.
53. Creswell, J.W. (2009) *Research Design, Qualitative, Quantitative and Mixed Methods Approach*, Second Edition, Sage Publications, Inc. *critical period for weight gain*. Eating Behaviour, 4:363-367.
54. Cummings J.H., Bingham S.A., (1998) *Diet and the prevention of cancer*. British Medical Journal, 1998, 317:1636--1640.
55. Cusick, William J., (2009) *All customers are irrational: understanding what they think, what they feel and what keeps them coming back* AMACOM, Pub date: 2009
56. Dahlheimer S, Moraca T. (1998) *Perceptions of University Staff About Disordered Eating Behaviors in College Students*, Journal of the American Dietetic Association, Volume 98, Issue 9, Supplement 1, Page A77
57. Damasio, A.R., Damasio, H., Christen, Y. (1996) *Neurobiology of Decision-Making*, Springer, New York, 1996.
58. Daniel Kahneman (2010) *The Human Agent, Behavioral Changes and Policy Implications*, Obesity Prevention, Pages 417-421.
59. Davidson, R.J., Abercrombie, H., Nitschke, J.B., and Putnam, K. (1999) *Regional brain function, emotion and disorders of emotion*, Current Opinions in Neurobiology. 9, pp. 228–234.
60. Davis, C., et al (2007) *Factors associated with ratings of portion size: Relevance to the risk profile for obesity*, Eating Behaviors Volume 8, Issue 2, April 2007, Pages 170-176.
61. Davis-Chervin et al (1985) *Influencing food selection with point-of-choice nutrition information*. Journal of Nutrition Education 1985; 17:18-22.
62. de Castro J.M. (1990) *Social facilitation of duration and size but not rate of the spontaneous meal intake of humans*. Physiological Behaviour, 47:1129–35.

63. de Ridder, D., de Wit, J., Adriaanse, M.A., (2009) *Making plans for healthy diet: The role of motivation and action orientation*. *European Journal of Social Psychology*, 39: 622–630.
64. Delinsky, S.S., Wilson, T. (2008) *Weight gain, dietary restraint, and disordered*
65. Denzin, N. K., & Lincoln, Y. S. (2003). *Introduction: The discipline and practice of qualitative research*. In N. K. Denzin & Y. S. Lincoln (Eds.), *Strategies of qualitative inquiry* (2nd Ed.) (pp. 1 - 45). Thousand Oaks, CA: Sage.
66. Denzin, N.K. & Yvonna S. Lincoln (2005). *The Sage Handbook of Qualitative Research*. Thousand Oaks: Sage Publications.
67. Di Matteo, M.R., Haskard, K.B., & Williams, S. L. (2007) *Health beliefs, disease severity, and patient adherence: A meta-analysis*. *Medical Care*, 45, 521-528.
68. Diliberti, N., Bordi, P.L., Conklin, M.T., Roe, L.S., Rolls, B.J. (2004) *Increased Portion Size Leads to Increased: Energy Intake in a Restaurant Meal*. *Obesity Research*, 12: 562-568.
69. Dodd et al (2010) *Lifestyle risk factors of students: A cluster analytical approach*, *Medicine* 51 pp. 73–77.
70. Dollahite, J., Hosig, K.W., White, K.A., Rodibaugh, R., Holmes, T.M. (1998) *Impact of a school-based community intervention program on nutrition knowledge and food choices in elementary school children in the rural Arkansas delta*. *Journal of Nutritional Education*, 30:289.
71. Dorfman L, Wallack L. (2007) *Moving nutrition upstream: the case for reframing obesity*. *Journal of Nutrition Education Behaviour*. 39:S45-S50.
72. Drewnowski & Rolls (2005) *De-Marketing Obesity*, *California Management Review* vol. 47, No. 4.
73. Drewnowski, A., & Rolls, B., (2005), *Symposium: Modifying the Food Environment: Energy Density, Food Costs, and Portion Size*, How to Modify the Food Environment American Society for Nutritional Sciences. *Journal of Nutrition*. 135: 898 – 899.
74. Dwyer et al. (1996) *Improving school breakfasts: effects of the CATCH Eat Smart Program on the nutrient content of school breakfasts*. *Preventive Medicine*, 25:413-422.
75. Economos et al (2008) *College freshman stress and weight change: Differences by gender*. *American Journal of Health Behavior*, 32:16-25.
76. Ello-Martin, J.A., Ledikwe, J.H., Rolls, B.J. (2005) *The influence of food portion size and energy density on energy intake: implications for weight management*. *American Journal of Clinical Nutrition*, 82: 236S-241S.
77. Ello-Martin, J.A., Ledikwe, J.H., Rolls, B.J. (2005) *The influence of food portion size and energy density on energy intake: implications for weight management*. *American Journal Clinical Nutrition*, 82(1 Suppl):236S–41S.

78. Emma Dresler-Hawke and Ekant Veer (2006) *Making healthy eating messages more effective: combining integrated marketing communication with the behaviour ecological model*, International Journal of Consumer Studies, 30, 4, July 2006, pp318–326.
79. Epstein RM, Borrell-Carrio F (2005) *The bio-psychosocial model: exploring six impossible things*. Families, Systems & Health 22 Dec 2005 ([http://en.wikipedia.org/wiki/Biopsychosocial\\_model#cite\\_note-21](http://en.wikipedia.org/wiki/Biopsychosocial_model#cite_note-21))
80. Ernerson et al (2010) *An obesity provoking behaviour negatively influences young normal weight subjects' health related quality of life and causes depressive symptoms* Eating Behaviors, Volume 11, Issue 4, December 2010, Pages 247-252.
81. Evans W. D., Blitstein J., Hersey J.C., Renaud J., Yaroch A. L. *Systematic Review of Public Health Branding*, Journal of Health Communication: International Perspectives, 1087-0415, Volume 13, Issue 8, 2008, Pages 721 – 741.
82. Eves A. Kipps M. & Parlett G. (1995) *Undernourished students – myth or reality?* Nutrition & Food Science, Number 2 · March/April 1995 · pp. 5–11 © MCB University Press · ISSN 0034-6659
83. Farhat et al (2010) *Overweight, Obesity, Youth, and Health-Risk Behaviors*, American Journal of Preventive Medicine 2010;38(3):258 –267.
84. FEDOROFF, I.D.C., POLIVY, J., HERMAN, P.H., (1997) *The Effect of Pre-exposure to Food Cues on the Eating Behavior of Restrained and Unrestrained Eaters* Appetite, Volume 28, Issue 1, Pages 33-47.
85. Fishbein M, Ajzen I. (1975) *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, Mass: Addison-Wes- ley.
86. Fishbein, M. et al. (1991) *Factors influencing behaviour and behaviour change*. Final report prepared for NIMH theorists workshop. Washington, D.C.
87. Florence, M.D., Asbridge, M., Veugelers, P.J. (2008) *Diet quality and academic performance*. Journal of School Health. 2008 Apr;78(4):209-15; quiz 239-41.
88. Frankel, R., Quill, T., McDaniel, S., (2003). *The Biopsychosocial Approach: Past, Present, Future*. Boydell & Brewer: [http://books.google.co.uk/books?id=hplwZAWGjcMC&printsec=frontcover&dq=9781580461023&source=bl&ots=U65Ki8y4Mx&sig=KZxA21dV\\_DRuPl661VSOFPIjyF4&hl=en&ei=QVbgS\\_TPIISy0gS88cinCA&sa=X&oi=book\\_result&ct=result&resnum=1&ved=0CAsQ6AEwAA#v=onepage&q&f=false](http://books.google.co.uk/books?id=hplwZAWGjcMC&printsec=frontcover&dq=9781580461023&source=bl&ots=U65Ki8y4Mx&sig=KZxA21dV_DRuPl661VSOFPIjyF4&hl=en&ei=QVbgS_TPIISy0gS88cinCA&sa=X&oi=book_result&ct=result&resnum=1&ved=0CAsQ6AEwAA#v=onepage&q&f=false)
89. French, S.A., Story, M., Jeffery, R.W. (2001) *Environmental influences on eating and physical activity*. Annual Revue of Public Health, 22:309–335.
90. Friedman, M.A., Brownell, K.D. (1995) *Psychological correlates of obesity: moving to the next research generation*. Psychology Bulletin 1995;117(1):3–20.
91. Fulkerson, et al (2002) *Foodservice staff perceptions of their influence on student food choices*, Original Research Article Journal of the American Dietetic Association, Volume 102, Issue 1, January 2002, Pages 97-99.

92. Gedrich, K., (2003) *Determinants of nutritional behaviour: a multitude of levers for successful intervention?* *Appetite* Volume 41, Issue 3, December 2003, Pages 231-238.
93. Geier, A. B., Rozin, P., & Doros, G. (2006) *Unit bias. A new heuristic that helps explain the effect of portion size on food intake.* *Psychological Science*, 17(6), 521–525.
94. Glanz K, Rimer BK, Lewis FM, (2002) *Health Behavior and Health Education: Theory, Research, and Practice.* 3rd ed. San Francisco, Calif: Jossey-Bass.
95. Goldberg M. (1997) *Social marketing: are we fiddling while Rome burns?* *Journal of Consumer Psychology* 4(4):347 – 70.
96. Goodwin, Jenifer (2010) *Junk Food 'Addiction' May Be Real* by Health Day Reporter, accessed at: <http://www.businessweek.com/lifestyle/content/healthday/637430.html>
97. Government's National Child Measurement Programme (NCMP) for England. (2008/09), Retrieved from: [www.ic.nhs.uk/.../ncmp/ncmp0809/NCMP\\_England\\_2008\\_09\\_school\\_year\\_report\\_2.pdf](http://www.ic.nhs.uk/.../ncmp/ncmp0809/NCMP_England_2008_09_school_year_report_2.pdf)
98. Gow, Rachel W., Trace, Sara E., and Mazzeo, Suzanne E., (2010) *Preventing weight gain in first year college students: An online intervention to prevent the "freshman fifteen"* *Eating Behaviors* Volume 11, Issue 1, Pages 33-39.
99. Graham Moon et al. (2007) *Fat nation: Deciphering the distinctive geographies of obesity in England* *Social Science & Medicine* 65 (2007) 20–31.
100. Green, Michael W., Rogers, Peter J., Elliman, Nicola A. (2000) *Dietary restraint and addictive behaviors: The generalizability of Tiffany's Cue Reactivity Model,* *International Journal of Eating Disorders*, Volume 27, Issue 4, pages 419–427.
101. Guerrieri, R., Nederkoorn, C., Jansen, A., (2007) *How impulsiveness and variety influence food intake in a sample of healthy women,* *Appetite*, Volume 48, Issue 1, Pages 119-122.
102. Guo, S.S., Chumlea, W.C., (1999) *Tracking of body mass index in children in relation to overweight in adulthood.* *American Journal of Clinical Nutrition.* Vol. 70:145S-148S.
103. Hall, P. A., Fong, G. T., Epp, L. J., & Elias, L. (2008). *Executive function moderates the intention-behavior link for physical activity and dietary behavior.* *Psychology & Health*, 23, 309–326.
104. Hamlin, R.P. (2010) *Cue-based decision making. A new framework for understanding the uninvolved food consumer.* *Appetite*, 55(1):89-98.
105. Hastings, G. (2007) *Social Marketing - Why Should the Devil Have All the Best Tunes?* Butterworth-Heinemann.
106. Health Priority. <http://www.who.int/dietphysicalactivity/en/>.
107. Healthcare Research and Quality; February 2001.

108. Hermans et al (2009) *Effects of social modelling on young women's nutrient-dense food intake*, *Appetite* 53 (2009) 135–138.
109. Hewes et al. (1996) *Improving school breakfasts: effects of the CATCH Eat Smart Program on the nutrient content of school breakfasts*. *Preventive Medicine* 1996; 25:413-422. In Phil Hider *Environmental interventions to reduce energy intake or density A critical appraisal of the literature*.
110. Hill, J.O., Wyatt, H.R., and Peters, J.C., (2005) *Modifying the Environment to Reverse Obesity*, *Environmental Health Perspectives*, SI: 108-115; James O. Hill and John C. Peters, (1998) *Environmental contributions to the obesity epidemic* *Science*, 280/5368.
111. Hoffman et al (2006) *Changes in body weight and fat mass of men and women in the first year of college: A study of the freshman 15*. *Journal of American College Health*, 52:41-45.
112. Hofmann, W., Friese, M., & Strack, F. (2009). *Impulse and self-control from a dual-systems perspective*. *Perspectives on Psychological Science*, 4, 162–176.
113. Honvarth, C.C., (1991) *Dietary intakes and nutritional status among university undergraduates*. *Nutritional Research*, 11:395-404.
114. Hossain, P., Kavar, B., and Nahas, M., (2007) *Obesity and diabetes in the developing world – a growing challenge*, *New England Journal of Medicine* 356, pp. 213–215.
115. HSE (2006) *The burden of food related ill health in the UK*, *Journal of Epidemiology and Community Health*, 59, 1054–7;
116. J. Ogden (2003) *Some problems with social cognition models: a pragmatic and conceptual analysis*, *Health Psychology* 22 (2003), pp. 424–428.
117. J.A. Bargh and T.L. Chartrand, (1999) *The unbearable automaticity of being*, *American Psychology*. 54 (1999), pp. 462–479.
118. J.A. Bargh, T.L. Chartrand (1999) *The unbearable automaticity of being*, *American Psychology*. 54 462–479.
119. Jacobs D.R. Jr et al. (1998) *Whole-grain intake and cancer: an expanded review and meta-analysis*. *Nutrition and Cancer*, 1998, 30:85--96.
120. Jaime, Patricia Constante and Lock, Karen (2009) *Do school based food and nutrition policies improve diet and reduce obesity?* *Preventive Medicine* Volume 48, Issue 1, Pages 45-53.
121. James Fry and Willa Finley (2005) *Proceedings of the Nutrition Society*, 64, 359–362.
122. Jastran, M., Bisogni, C.A., Sobal, J., Blake, C., and Devine, C.M. (2010) *Eating routines: Embedded, value based, modifiable, and reflective*, retrieved on Feb 10<sup>th</sup> 2010 from: <http://www.ncbi.nlm.nih.gov/entrez/ef&cmd=prlinks&id=18835305>

123. Jastran, M.M. et al (2009) *Eating routines. Embedded, value based, modifiable, and reflective* *Appetite*, Volume 52, Issue 1, Pages 127-136.
124. Jebb S. (2008) *New survey shows Americans ignore importance of portion size in managing weight*. Available at: Report on the Food Standards Agency Workshop on portion size, the Food Standards Agency hosted a portion size workshop. American Institute of Cancer Research.
125. Jeffery, R. W., Rydell, S., Dunn, C. L., Harnack, L. J., Levine, A. S., Pentel, P. R., et al. (2007). *Effects of portion size on chronic energy intake*. *International Journal of Behavior, Nutrition and Physical Activity*, 4, 27.
126. Jenkins, D., et al (1997) *Effect of a Diet High in Vegetables, Fruit, and Nuts on Serum Lipids, Metabolism*, Vol 46, No 5 (May), 1997: pp 530-537
127. Johnson, Paul M.; Kenny, Paul J. (2010) *Dopamine D2 receptors in addiction-like reward dysfunction and compulsive eating in obese rats* *Nature Neuroscience* 13: 635.
128. Kähkönen, P., Tuorila, H., (1998) *Effect of reduced-fat information on expected and actual hedonic and sensory ratings of sausage*. *Appetite*. 1998;30: 13-23.
129. Kahneman, D. (2003). *A perspective on judgment and choice*. *American Psychologist*, 58(9), 697–720.
130. Kahneman, D., & Tversky, A. (1972) *Subjective probability: A judgment of representativeness*. *Cognitive Psychology*, 3, 430–454.
131. Kahneman, D., & Tversky, A. (1973). *On the psychology of prediction*. *Psychological Reviews*, 80, 237–251.
132. Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. New York: Cambridge University Press.
133. Keller et al. (2008) *Multiple health risk behaviors in German first year university students*, *Preventive Medicine* 46, pp. 189–195.
134. Kessler, H., Wunderlich, S.M., (1999). *Relationship between use of food labels and nutrition knowledge of people with diabetes*. *Diabetes Education*, 25:549-559.
135. Kim, K., Reicks, M., Sjoberg, S. *Applying the theory of planned be-*
136. Koster E.P. (2009) *Diversity in the determinants of food choice: A psychological perspective*, *Food Quality and Preference* 20 (pp. 70–82)
137. Koster, E. P. (1996) *The consumer? The quality?* In: *Production industrielle & qualite' sensorielle Agoral 96. Huitie`mes rencontres scientifiques et technologiques des industries alimentaires 2–3 Avril 1996, Dijon* (pp. 11–19). Paris: Lavoisier Tec & Doc.
138. Koster, E. P. (2003) *The psychology of food choice: Some often encountered fallacies*. *Food Quality and Preference*, 14, 359–373.
139. Koster, E. P., & Mojet, J. (2007). *Theories of food choice development*. In L. Frewer & H. C. M. Van Trijp (Eds.), *Understanding consumers of food products* (pp. 93–124). Abbingdon, Cambridge, UK: Woodhead Publishing.



- 140.Koster, E.P. (2009) 2nd European Conference on Sensory Consumer Science of Food and Beverages, Date: SEP 26-29, 2006 The Hague NETHERLANDS Source: FOOD QUALITY AND PREFERENCE Volume: 20 Issue: 2 Pages: 70-82 Published: 2009
- 141.Kotler, P., & Lee, N. (2008). *Social marketing: Influencing behaviors for good* (3rd ed.). Thousand Oaks, CA: Sage.
- 142.Kotler, P. and Zaltman, G. (1971) *Social marketing: an approach to planned social change*. *Journal of Marketing* 35, 3-12.
- 143.Kremers, S.P., et al (2005) *Preventing childhood obesity: a solution-oriented research paradigm*, *American Journal of Preventive Medicine*, 28, pp. S194–S201
- 144.Kremers, S.P., et al (2007) *MSc Moderators of Environmental Intervention Effects on Diet and Activity in Youth*, *American Journal of Preventive Medicine*, Volume 32, Issue 2, Pages 163-172.
- 145.Kreuter, M.W., Brennan, L.K., Scharff, D.P., Lukwago, S.N., (1997). *Do nutrition label readers eat healthier diets? Behavioral correlates of adults' use of food labels*. *American Journal of Preventive Medicine*, 13:277-283.
- 146.Krueger, R.A., (1998) *Focus groups: A practical guide for applied research*. Thousand Oaks, CA: Sage.
- 147.Kumanyika, S., van Horn, L., Bowen, D., Perri, M., Rolls, B., Czajkowski, S., et al. (2000). *Maintenance of dietary behavior change*. *Health Psychology*, 19(1s), 42e56.
- 148.Kurt Gedrich (2003) *Determinants of nutritional behaviour: a multitude of levers for successful intervention?* *Appetite*, Volume 41, Issue 3, December 2003, Pages 231-238.
- 149.Lake, A.A., Hyland, R.M., Rugg-Gunn, A.J., Wood, C.E., Mathers, J.C., Adamson, A.J., (2007) *Healthy eating: Perceptions and practice* (the ASH30 study) *Appetite*, Volume 48, Issue 2, March 2007, Pages 176-182.
- 150.Lefebvre R. Craig (2007) *35 Years of Positioning* [http://socialmarketing.blogs.com/r\\_craig\\_lefebvres\\_social/2007/03/35\\_years\\_of\\_pos.html](http://socialmarketing.blogs.com/r_craig_lefebvres_social/2007/03/35_years_of_pos.html)
- 151.Lefebvre, R.C. and Flora, J.A. (1988). *Social Marketing and Public Health Intervention* (Portable Document Format). *Health Education Quarterly*; 15 (3): 300, 301.
- 152.Leonard, P., (1973) *Ullmann Behavior Influence and personality, The social matrix of human action* Published by Holt Rinehart and Winston.
- 153.Levitsky D.A., Youn T. (2004) *The more food young adults are served, the more they overeat*. *Journal of Nutrition*, 134:2546–9.

154. Levitsky, D.A., Halbmaier, C.A., Mrdjenovic, G., (2004) *The freshman weight gain: a model for the study of the epidemic of obesity*. International Journal of Obesity Related Metabolic Disorders, 28:1435–42.
155. Levy, C. M., & Koster, E. P (1999) *Stimulus complexity and food preference*. Acta Psychologica, 123, 394–413. *The relevance of initial hedonic judgments in the prediction of subtle food choices*. Food Quality and Preference, 10, 185–200.
156. Liquori, T., Koch, P.D., Contento, I.R., Castle, J. (1998) *The CookShop program*:
157. Long, D.A., Reed, R., Lehman, G. (2006) *The cost of lifestyle health risks: obesity*.
158. Journal of Occupancy Environment Medicine, 48(3): 244-251.
159. Lowe, M.R. et al (2009) *The Power of Food Scale. A new measure of the psychological influence of the food environment* Appetite, Volume 53, Issue 1, Pages 114-118.
160. Lowe, M.R., et al. (2006) *Multiple types of dieting prospectively predict weight gain during the freshman year of college*. Appetite, 47:83–90.
161. Lowry, R.J. (2009) *Public Health Branding – applying marketing for social change*, Public Health, Volume 123, Issue 8, August 2009, Page 576.
162. Lytle, L.A., Varnell, S., Murray, D.M., et al (2003) *Predicting adolescents’*
163. M. F. McCarty (1999) *Vegan proteins may reduce risk of cancer, obesity, and cardiovascular disease by promoting increased glucagon activity* Medical Hypotheses (1999) 53(6), 459–485 Article No. mehy.1999.0784 Nutrition 21/AMBI, San Diego, CA, USA
164. Ma et al., (2000) *Clustering of lifestyle behaviors: the relationship between cigarette smoking, alcohol consumption, and dietary intake*, American Journal of Health Promotion 15 (2000), pp. 107–117.
165. Marietta, A.B., Welshimer, K.J., Anderson, S.L., (1999) *Knowledge, attitudes, and behaviors of college students regarding the 1990 Nutrition Labelling Education Act food labels*. Journal of American Dietary Association, 99:445-449.
166. Martin, K.S., Ferris, A.M. (2007) *Food insecurity and gender are risk factors for*
167. Mathers, D.C. and D. Loncar, (2006) *Projections of global mortality and burden of disease from 2002 to 2030*, PLoS Med 3, pp. 2011–2030. In: A.D. Lopez, C.D. Mathers, M. Ezzati, D.T. Jamison and C.J.L. Murray, Editors, Global burden of disease and risk factors, Oxford University Press, New York, p. 8 Washington DC: The World Bank.
168. Matthiessen J, Fagt S, Biloft-Jensen A, Beck AM, Ovesen L. (2003) *Size makes a difference*. Public Health Nutrition, 6: 65–72.
169. Matthiessen, J., Fagt, S., Biloft-Jensen, A., Beck, A. M., & Ovesen, L. (2003). *Size makes a difference*. Public Health and Nutrition, 6(1), 65–72.

170. Mayo Clinic (2010) *Dietary fats: Know which types to choose* Nutrition and healthy eating, Source: Dietary Guidelines for Americans, 2010 Retrieved from: <http://www.mayoclinic.com/health/fat/NU00262/NSECTIONGROUP=2>
171. McKinnon, R.A., Reedy, J., Morrisette, M.A., Lytle, L.A., Yaroch, A.L., Maas, R., and Nisenholtz, G., (2009) *Measures of the Food Environment: A Compilation of the Literature*, American Journal of Preventive Medicine, Volume 36, Issue 4, Supplement 1, April 2009, Pages S124-S133
172. McCormick et al., (2007) *Economic costs of obesity and the case for government intervention* Department of Health, London, UK, obesity reviews p. 161–164.
173. McPherson, K., T. Marsh, and M. Brown (2007), *Tackling Obesities: Future Choices: Modeling Future Trends in Obesity and the Impact on Health* (London: Government Office for Science).
174. Meiselman et al (1994) *Effect of effort on meal selection and meal acceptability in a student cafeteria*. *Appetite* 1994; 23:43-55.
175. Mela (1999). *Food choice and food intake: The human factor*. *Proceedings of the Nutrition Society*, 58(3), 513–521.
176. Ming et al (2007) *Association between Unhealthful Eating Patterns and Unfavorable Overall School Performance in Children*, *Journal of American Dietary Association*, 107:1935-1943.
177. Misra, Ranjita (2007) *Knowledge, Attitudes, and Label Use among College Students*, *Research and Professional Briefs*, *Journal of American Dietary Association*, 107:2130-2134.
178. Moore et al (2010) *From policy to plate: Barriers to implementing healthy eating policies in primary schools in Wales* *Health Policy*, Volume 94, Issue 3, March 2010, Pages 239-245.
179. Morrow, M.L. (2006) *Freshman 15: Fact or fiction?* *Obesity*, 14:1438-1443.
180. National Audit Office (2001), *Tracking Obesity in England* (London: Her Majesty's Stationery Office).
181. Nestle M., Wolf S.H., *American Journal of Preventive Medicine* (2008), 34 (3)
182. Nestle M., Young L., (1998) *Variation of perceptions of a 'medium' Food Portion: Implications*
183. Neuhaus M.L., Kristal A.R., Patterson R.E., (1999) *Label users report diets lower in fat and cholesterol and higher in fruits and vegetables. Use of food nutrition labels is associated with lower fat intake*. *Journal of American Dietary Association*, 99:45-53.
184. Neutens J, Rubinson L. (2002) *Qualitative research*. In: *Research Techniques for the Health Sciences*. 3rd ed. San Francisco, CA: Benjamin Cummings:163-192.
185. NHS (2009) *Expited Press Releases, Eat Your Greens, Research reveals a broccoli boost for arteries*, retrieved from <https://yheart.net/default.aspx?page=10400>

- 186.NHS Scotland (2008) *Fesoterodine fumarate 4mg and 8mg prolonged release tablets*. Scottish Medicines Compendium. NHS Scotland. [www.scottishmedicines.org.uk](http://www.scottishmedicines.org.uk)
- 187.Nicholson, M. & Xiao, S.H. (2008) *Social Marketing and Behaviour Analysis: Some thoughts on the management of obesity*, Symposium on the Management of Obesity. Salford Business School, UK.,
- 188.Nielsen S.J. and Popkin B.M. (2004) *Changes in beverage intake between 1977 and 2001*. American Journal of Preventative Medicine, 27 (3), 205-10.
- 189.Nielsen S.J., Popkin B.M. (2003) *Patterns and trends in food portion sizes, 1977–1998*. JAMA , 289:450–3.
- 190.Nielsen, S. J., & Popkin, B. M. (2003) *Patterns and trends in food portion sizes, 1977–1998*. Journal of American Medical Association, 289, 450–453.
- 191.Nord, M., Andrews, M., Carlson, S. (2005) *Household food security in the US*,
- 192.Ogden J, Karim L, Choudry A, Brown K. (2007) *Understanding successful behaviour change: The role of intentions, attitudes to the target and motivations and the example of diet*. Health Education Resources; 22: 397–405.
- 193.Oliver, J. E. (2006) *Fat Politics: The Real Story behind America's Obesity Epidemic* (New York: Oxford University Press).
- 194.Patricia Constante Jaime, Karen Lock, (2009) *Do school based food and nutrition policies improve diet and reduce obesity?* Preventive Medicine 48 (2009) 45–53.
- 195.Peattie, K. and Peattie, S. (2009) *Social Marketing: A Pathway to Consumption Reduction?* Journal of Business Research, Vol. 62 (2), pp. 260-268.
- 196.Pliner, P., Saunders, T., (2008) *Vulnerability to freshman weight gain as a function of dietary restraint and residence*. Physiological Behaviour. 93:76–82. From: Who gains or who loses weight? Psychosocial factors among first-year university students.
- 197.Popkin et al (2005) *Environmental influences on food choice, physical activity and energy balance*, Physiology & Behavior, Volume 86, Issue 5, 15, Pages 603-613.
- 198.Popkin, B. M., S. Kim, E. R. Rusev, S. Du, and C. Zizza (2006) *Measuring the Full Economic Cost of Diet, Physical Activity and Obesity-Related Chronic Diseases*, Obesity Reviews, 7/3: 271-93.
- 199.Potter J.D., Steinmetz K. (1996) *Vegetables, fruit and phytoestrogens as preventive agents*. In: Stewart BW, McGregor D, Kleihues P, eds. Principles of chemoprevention. Lyon, International Agency for Research on Cancer, 1996:61--90 (IARC Scientific Publications, No. 139).
- 200.*Practice*. Sudbury, Ma: Jones and Bartlett Publishers, Inc.; 2007 69. Page 333.
- 201.Provencher V. et al (2009) *Physiology & Behavior 96: Who gains or who loses weight? Psychosocial factors among first-year university students*; p. 135–141.

202. Provencher, V., Polivy, J., Herman, P. (2009) *Perceived healthiness of food. If it's healthy, you can eat more!* *Appetite*, Volume 52, Issue 2, Pages 340-344.
203. Racette et al (2008) *Changes in weight and health behaviors from freshmen through senior*
204. Rampersaud et al (2005) *Breakfast Habits, Nutritional Status, Body Weight, and Academic Performance in Children and Adolescents*, *Journal of American Dietetic Association*.
205. Randolph, W., Viswanath K. (2004) *Lessons learned from public health mass media campaigns: marketing health in a crowded media world*. *Annual Review Public Health*. 25:419-437.
206. Reicks, M., Mills, J., Henry, H. (2004) *Qualitative study of spirituality in a*
207. Ren et al (2009) *Type 2 diabetes mellitus associated with increased risk for colorectal cancer: Evidence from an international ecological study and population-based risk analysis in China*, *Public Health*, Volume 123, Issue 8, August 2009, Pages 540-544.
208. Reynolds et al. (2000) *Increasing the fruit and vegetable consumption of fourth-graders: results from the High 5 Project*. *Preventive Medicine* 2000; 30:309-319.
209. Rober, H. (2001) *Hidden Power of Advertising: The hidden power of advertising how low involvement processing influences the way we choose brands*. Published by *Admap Publications in Henley-on-Thames*
210. Robert P. Hamlin (2010) *Cue-Based Decision Making. A new framework for understanding the uninvolved food consumer* *Appetite*. 2010 Aug;55(1):89-98. Epub 2010 Apr 24.
211. Robert Tobias (2009), *Changing Behaviour by Memory Aids: A Social Psychological Model of Prospective Memory and Habit Development Tested With Dynamic Field Data*, *Psychological Review* © 2009 American Psychological Association 2009, Vol. 116, No. 2, 408–438.
212. Roefs et al (2006) *The environment influences whether high-fat foods are associated with palatable or with unhealthy*, *Original Research Article Behaviour Research and Therapy*, Volume 44, Issue 5, May 2006, Pages 715-736.
213. Roger, B. & Sargeant, A., (2005) *The nonprofit marketing landscape: guest editors' introduction to a special section*, *Journal of Business Research* 58, 797 – 805.
214. Rolls, B.J. et al (2007) *Using a smaller plate did not reduce energy intake at meals*, *Appetite*, Volume 49, Issue 3, Pages 652-660.
215. Rolls, B.J., Engell, D., Birch, L.L., (2000) *Serving portion size influences 5-year old but not 3-year old children's food intakes*. *Journal of American Dietary Association*, 100:232-234.

216. Rolls, B.J., Morris, E.L., Roe, L.S. (2002) *Portion size of food affects energy intake in normal-weight and overweight men and women*. American Journal of Clinical Nutrition, 76:1207–13.
217. Rolls, B.J., Roe, L.S., Meengs, J.S. (2006) *Reduction in portion size and energy density of foods are additive and lead to sustained decreases in energy intake*. American Journal of Clinical Nutrition, 83:11–7.
218. Rolls, E. T. (2005). *Emotion explained*. Oxford: Oxford University Press.
219. Rosenstock, I.M. (1974). *Historical origins of the Health Belief Model*. Health Education Monogram; 2:328-335.
220. Rothschild, M. (1999) *Carrots, Sticks, and promises: A conceptual framework for the management of public health and social issue behaviors*, Journal of Marketing 46(Winter): 15-26.
221. Rozin P., Kabnick K., Pete E., Fischler C. and Shields C. (2003) *The ecology of eating: smaller portion sizes in France than in the United States help explain the French Paradox*. Psychological Science, 14 (5), 450-454.
222. Rozin, P. et al (2006) *Self-prediction to hedonic trajectories for repeated use of body products and foods: Poor performance, not improved by a full generation of experience*, Appetite, Volume 46, Issue 3, May 2006, Pages 297-303.
223. Sahota, P., Rudolf, M.C.J., Dixey, R., Hill, A.J., Barth, J.H., Cade, J (2001) *Evaluation of implementation and effect of primary school based intervention to reduce risk factors for obesity* British Medical Journal Volume 323, Issue 7320, Pages 1027-1029.
224. Sahota, P., Rudolf, M.C.J., Dixey, R., Hill, A.J., Barth, J.H., Cade, J. (2001) *Randomised controlled trial of primary school based intervention to reduce risk factors for obesity*, British Medical Journal Volume 323, Issue 7320, Pages 1029-1032.
225. Sallis, J.F., et al (2003). *Environmental interventions for eating and physical activity: A randomized controlled trial in middle schools*. American Journal of Preventive Medicine Volume 24, Issue 3, Pages 209-217.
226. Scheibehenne, B., Miesler, L., Todd, P.M. (2007) *Fast and frugal food choices: Uncovering individual decision heuristics*, Appetite, Volume 49, Issue 3, November 2007, Pages 578-589.
227. Schuette, L.K., Song, W.O., Hoerr, S.L., (1996) *Quantitative use of the Food Guide Pyramid to evaluate dietary intake of college students*. Journal of American Dietary Association, 96:453-7.
228. Schultz and Schultz (2004) *Brand Babble, Sense and Nonsense About Branding*
229. Schwab, M., Syme, S.L. (1997) *On paradigms, community participation, and the future of public health*. American Journal of Public Health 87 (12): 2049-2051.
230. Schwartz, Marlene B., (2008) *Evaluating School Wellness Policies in Connecticut*, Rudd Center for Food Policy and Obesity, Yale University.

231. Shide, D.J., Rolls B.J. (1995) *Information about fat content of preloads influences energy intake in healthy women*. Journal of American Dietary Association, 95:993- 998.
232. Siegel, M., & Lotenburg, L.D., (1998) *Marketing public health: Strategies to promote social change*. (2<sup>nd</sup> ed.). Boston: Jones & Bartlett.
233. Silverman (2001) *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction*. London: Sage Publications Ltd
234. Simon A. Moss, Samuel Wilson, (2010) *Integrating the most unintuitive empirical observations of 2007 in the domain of personality and social psychology into a unified framework*. New Ideas in Psychology, Volume 28, Issue 1, Pages 1-27
235. Singleton, R.A. & Straits, B.C. (1999). *Approaches to Social Research* (3<sup>rd</sup> Ed.). New York: Oxford University Press.
236. Skinner, J.D. (1991) *Changes in students' dietary behavior during a college nutrition course*. Journal of Nutritional Education, 23:72-5.
237. Smedley, B., Syme, S.L., (2000) *Promoting Health: Intervention Strategies*
238. Snyder et al. (1999) *The pathways study: a model for lowering the fat in school meals*. American Journal of Clinical Nutrition 1999; 69 (4 Supp):810S-815S.
239. Snyder Leslie B, (2007) *Health Communication Campaigns and Their Impact on Behaviour*, Journal of Nutrition Education Behaviour, 39:S32-S40.
240. Snyder, M., Story, M., Treknier, L. (1992) *Reducing fat and sodium in school lunch programs: the Lunchpower Intervention Study*. Journal of the American Dietetic Association 1992; 92:1087-1091.
241. Sommers, Craig B. (2006) *Raw Food Bible*
242. Stamp Program (2008) *Approved federal funds for food stamp nutrition*
243. Steptoe, A. et al (2002) *Trends in Smoking, Diet, Physical Exercise, and Attitudes toward Health in European University Students from 13 Countries, 1990–2000*, Preventive Medicine, Volume 35, Issue 2, August 2002, Pages 97-104.
244. Steptoe, Andrew and Jane Wardle, (2001) *Health behaviour, risk awareness and emotional well-being in students from Eastern Europe and Western Europe*, Social Science & Medicine, Volume 53, Issue 12, December 2001, Pages 1621-1630
245. Stok, F.M. et al (2010) *Looking cool or attaining self-rule. Different motives for autonomy and their effects on unhealthy snack purchase* Appetite Volume 54, Issue 3, June 2010, Pages 607-610.
246. Stokols D. (1996) *Translating social ecological theory into guidelines for community health promotion*. American Journal of Health Promotion. 10:282-298.

247. Stokols D. (1996) *Translating social ecological theory into guidelines for community health promotion*. American Journal of Health Promotion. 10:282-298.
248. Strauss, A., and Corbin, J., (1998) *Basics of Qualitative Research Techniques and Procedures for Developing Grounded Theory*. 2nd edition London: Sage Publications
249. Stroebele, N., De Castro, J.M. (2004) *Effect of ambience on food intake and food choice*, Nutrition, Volume 20, Issue 9, September 2004, Pages 821-838.
250. Susan Church (2008) *Trends in portion sizes in the UK - A preliminary review of published information* Report to the Food Standards Agency May 2008
251. Tanja, V.E., Kral, E., Rauh, M. (2010) *Eating behaviors of children in the context of their family environment*, Physiology & Behavior vol 33, p. 322-331.
252. Taylor, S. J., & Bogdan, R. (1998) *Introduction to qualitative research methods* (3rd ed.). New York: John Wiley.
253. Terracciano, et al (2009) *Facets of personality linked to underweight and overweight*, Psychosomatic Medicine; 71(6): 682–689. Published online 2009 May 4. doi: 10.1097/PSY.0b013e3181a2925b. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2711222/>
254. Terry-McElrath, Y.M., O'Malley, P.M., Delva, J., and Johnston, L.D., (2010) *The School Food Environment and Student BMI and Food Consumption: 2004 to 2007 National Data* Journal of Adolesc Health. Author manuscript; available in PMC 2010 September 1
255. Thaler, R. H., & Sunstein, C.R. (2008) *Nudge: Improving decisions about health, wealth and happiness*. New York: Penguin.
256. The Food Trust, 2004 The Food Trust Mission <http://www.thefoodtrust.org/php/about/OurMission.php>
257. Thombs, D.L., Mahoney, C.A., McLaughlin, M.L. (1998) *Expectancies, self-*
258. Tordoff, M. G. (2002). *Obesity by choice: the powerful effect of nutrient availability on nutrient intake*. American Journal of Physiology: Regulatory, Integrative and Comparative Physiology, 282, R1536–R1539.
259. Townsend, M.S., Peerson, J., Lowe, B., Achterberg, C., Murphy, S.P. (2001) *Food*
260. *trol*. Journal of Nutritional Education Behavior, 36:13-19.
261. Trout, J., (1996) *New positioning: the latest on the world's #1 business strategy*, New York McGraw-Hill.
262. Tudoran et al (2009) *The effect of health benefit information on consumers health value, attitudes and intentions*, Appetite 52 (2009) p. 568–579.
263. Tversky, A., & Kahneman, D. (1974) *Judgment under uncertainty*. Science, 185, 1124–1131.



264. Tversky, A., & Kahneman, D. (1981) *The framing of decisions and the psychology of choice*. Science, 211, 453–458.
265. Tversky, A., & Kahneman, D. (1983). *Extensional versus intuitive reasoning: The conjunction fallacy in probability judgment*. Psychological Review, 90, 293–315.
266. Ueland Ø., Cardello A. V. (2009) *Effect of Portion Size Information on Food Intake* Journal of American Dietary Association. 109:124-127.
267. US Department of Agriculture Economic Research Service (2008) *The*
268. Van Baal, P. H. M., J.J. Polder, G.A. de Wit, R.T. Hoogenveen, T.L. Feenstra, H.C. Boshuizen, P.M. Engelfriet, and W.B. Brouwer (2008), *Lifetime Medical Cost of Obesity: Prevention not Cure for Increasing Health Expenditure*, PLoS Medicine, 5/2: e29.
269. Vermeer, W. M., Steenhuis, I. H., & Seidell, J. C. (2009). *Portion size: a qualitative study of consumers' attitudes toward point-of-purchase interventions aimed at portion size*. Health Education Research Advance Access 10.1093/her/cyp051.
270. Vermeer, W.M., et al (2010) *Two pack king size chocolate bars. Can we manage our consumption?* Appetite, Volume 54, Issue 2, Pages 414-417.
271. Viswanath K. (2002) *Lessons learned from public health mass media campaigns: marketing health in a crowded media world*. Annual Revue of Public Health. 25:419-437.
272. Wadden TA, et al. (2002) *Psychosocial consequences of obesity and weight loss*. In:
273. Wadden TA, Stunkard AJ, editors. Handbook of Obesity Treatment. New York: Guilford Press; 2002. p. 144–69.
274. Wadden, T.A., Stunkard AJ. (1993) *Psychological consequences of obesity and dieting: research and clinical findings*. In: Stunkard AJ, Wadden TA, editors. Obesity: Theory and therapy. New York: Raven Press; 1993. p. 163–77.
275. Wallack and Dorfman (1996) *Media advocacy: a strategy for advancing policy and promoting health*. Health Education Quarterly; 23:293-317.
276. Wallis D.J., Hetherington, M.M. (2009) *Emotions and eating. Self-reported and experimentally induced changes in food intake under stress*. Appetite 52 p.355–362.
277. Walter et al. (2005) *Motivation Forces of Human Actions- Neuroimaging, reward and social interaction*. Brain Research Bulletin 67, p. 368–381.
278. Wansink (2004), Priya Raghurir and Aradna Krishna, *Vital Dimensions in Volume Perception: Can the Eye Fool the Stomach?* Journal of Marketing Research, 36 (August 1999): 313-326.
279. Wansink B, Chardon P. (2006) *Can low-fat nutrition labels lead to obesity?* Journal of Marketing Research, vol. 43, p. 605-17.

280. Wansink B. (2010). *From mindless eating to mindlessly eating better* *Physiology & Behavior*, Volume 100, Issue 5, 14 July 2010, Pages 454-463.
281. Wansink, B. (2004) *Environmental Factors that Increase the Food Intake and Consumption Volume of Unknowing Consumers*, *Annual Review of Nutrition*, 24; 455-479.
282. Wansink, B. (2005) *Marketing Nutrition: Soy, Functional Foods, Biotechnology, and Obesity* Champaign, IL: University of Illinois Press.
283. Wansink, B. (2006) *Mindless Eating: The Hidden Persuaders that Make Us Lose and Gain Weight* New York, NY: Bantam-Dell.
284. Wansink, B., & Sobal, J. (2007). *Mindless eating: the 200 daily food decisions we overlook*. *Environment and Behavior*, 39, 106–123.
285. Wansink, B., (1996) *Can package size accelerate usage volume*. *Journal of Marketing*, 60, p.1-13,
286. Wansink, B., et al (2008) *Behavioral economic concepts to encourage healthy eating in school cafeterias* USDA Economic research report, number 68.
287. Wansink, Brian and Huckabee, Mike (2005) *De-Marketing Obesity California Management Review* vol. 47, NO. 4, p.5 FIGURE 3. Four Drivers of Consumption
288. Wardle, J., Parmenter, K., & Waller, J. (2000). *Nutrition knowledge and food intake*. *Appetite*, 34, 269e275.
289. Wechsler et al (2000) *Using the School Environment to Promote Physical Activity and Healthy Eating*, *Preventive Medicine* Volume 31, Issue 2, Pages S121-S137.
290. Whitaker, R., Wright, J., Finch, A., Psaty, W. (1993) *An environmental intervention to reduce dietary fat in school lunches*. *Pediatrics*, 91:1107-1111.
291. White, C., (2003) *Cancer rates in Europe are linked to overweight*, *British Medical Journal*
292. WHO (2004) *Global strategy on diet, health and physical activity*. Strategy document No. WHA57.17. Dated 22 May 2004. Geneva: World Health Organization.
293. Wild, S., Roglic, G., Green, A., Sicree, R., and King, H., (2004) *Global prevalence of diabetes: estimates for the year 2000 and projections for 2030*, *Diabetes Care* 27 (2004), pp. 1047–1053.
294. Williams, C.L., Bollella, M.C., Strobino, B.A., Spark, A., Nicklas, T.A., Tolosi, L.B., Pittman, B.P. (2002) *Healthy-Start™: Outcome of an intervention to promote a heart healthy diet in preschool children*, Columbia University, Institute of Human Nutrition, Babies and Children's Hospital, 3959 Broadway, New York, NY 10032, *United States Journal of the American College of Nutrition* Volume 21, Issue 1, Pages 62-71.

295. Wilson, T. D. (2002). *Strangers to ourselves: Discovering the adaptive unconscious*. Cambridge: The Belknap Press of Harvard University Press.
296. Winkielman, P., & Berridge, K. C. (2004) *Unconscious emotion*. *Current Directions in Psychological Science*, 30(3), 120–123.
297. Wong, F. et al. (2004) *A social marketing campaign to increase physical activity among youth*. *Preventive Chronic Diseases* [serial online]. Available at: [www.cdc.gov/pcd/issues/2004/jul/04\\_0043.html](http://www.cdc.gov/pcd/issues/2004/jul/04_0043.html)
298. Woodman, Theo Lorene, Angela Harden, Ann Oakley (2008) *Social and environmental interventions to reduce childhood obesity: a systematic map of reviews* EPPI-Centre report no. 1610, September 2008.
299. World Cancer Research Fund (1997) *Food, nutrition and the prevention of cancer: a global*
300. World Cancer Research Fund / American Institute for Cancer Research. (2007) *Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective*. Washington DC: AICR.
301. World Cancer Research Fund/American Institute for Cancer Research (1997) *Food, nutrition and the prevention of cancer: a global perspective*. Washington, DC,
302. World Health Organisation (2000) *Obesity: preventing and managing the global epidemic*. Report of a WHO consultation. Geneva.
303. World Health Organization (2004) *Global strategy on diet, physical activity and health*. WHA57.17. World Health Organization, Draft action plan for the global strategy for the prevention and control of noncommunicable diseases A61/8. 61st World Health Assembly. Provisional agenda item 11.5. Available from: [http://www.who.int/gb/ebwha/pdf\\_files/A61/A61\\_8-en.pdf](http://www.who.int/gb/ebwha/pdf_files/A61/A61_8-en.pdf) (2008) [accessed 02.07.08].
304. World Health Organization (2008). Diet and physical activity: A public
305. Wrieden W., Gregor A. and Barton K. (2008) *Have food portion sizes increased in the UK over the last 20 years?* Proceedings of the Nutrition Society. (Presented at the Scottish Section Nutrition Society meeting, 27-28 March 2008; abstract available at: <http://www.nutritionandsociety.org/files/uploads/0080218ScottishMeetingOriginal>
306. [www.ers.usda.gov/publications/EIB6-5](http://www.ers.usda.gov/publications/EIB6-5). Accessed August 19, 2008.
307. Yarrow, Kim and O'Donnell, Jane (2009) *Gen BuY: How Tweens, Teens and Twenty-Somethings Are Revolutionizing Retail*, Jossey-Bass September 8, 2009
308. *year of college*. *Journal of Nutritional Education Behavior*, 40:39-42.
309. Young, L.R., Nestle, M. (2007), *Portion Sizes and Obesity: Responses of Fast-Food Companies* *Journal of Public Health Policy*, Vol. 28, No. 2, pp. 238-248
310. Young, L.R., Nestle, M., (2002) *The contribution of expanding portion sizes to the U.S. obesity epidemic*. *American Journal of Public Health*, 92:246-249.

311. Young, M.E. et al (2009) *Food for thought. What you eat depends on your sex and eating companions*, *Appetite*, Volume 53, Issue 2, Pages 268-271.
312. Zajonc, R. B. (1984). *On the primacy of affect*. *American Psychologist*, 39, 117–123.
313. Zajonc, R.B. (1968) *Attitudinal effects of mere exposure*, *Journal of Personality and Social Psychology Monographs* 9 (1968) (2 Part 2), pp. 1–27.
314. Zaltman, Gerald (2003) *How customers think: essential insights into the mind of the market*, Harvard Business School Press, Pub date: 2003