

## DOCTORAL THESIS

### Children's health perception and health behaviour an intervention approach

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**Children's Health Perception and Health Behaviour:  
An Intervention Approach**

**by**

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**A thesis submitted in partial fulfillment of the requirements for the degree of PhD**

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## Abstract

The principal aim of this two-study research programme was to investigate the contribution of psychological factors to health behaviours in children, and the intention to perform them. The investigation focused on healthy eating, regular physical activity, avoiding smoking cigarettes and avoiding drinking alcohol.

The first study examined children's individual cognitions, past behaviour and perception of their own and their parents' health behaviours. Drawing from Social Cognitive Theory (Bandura, 1986) and the Theory of Planned Behaviour (Ajzen, 1985), the aim of study 1 was to investigate the extent to which these psychological factors could predict children's future intentions towards the above behaviours. The second study aimed to identify if a child's behavioural *intention* was a significant predictor of their *actual* health behaviour. Furthermore, it aimed to develop and run a series of theoretically based intervention workshops drawing from Prospect Theory (Kahneman & Tversky, 1979; 1982) and the Health Action Process Approach (Schwarzer, 1992) to promote health behaviours.

A cross-sectional quantitative survey design was used in the first study. Data was collected from 529 school-aged children within year groups 7 (11-12 years) and 10 (14-15 years) using an instrument specifically designed for this research, named the 'Health Perceptions Questionnaire'. The second study employed an experimental repeated measures 2x3 factorial design. With a sub-sample of study 1 (N = 72) it investigated interactions between pre and post intentions and behaviours, and the possible effects of two framed interventions compared to a control condition.

Results from study 1 indicate that the most significant predictors of health behaviour intention are behavioural importance, past behaviour, behaviour-specific self-efficacy, attitude and outcome expectancies. Many of the study variables were found to differ between year group and gender. Study 2 revealed there were no significant differences in behavioural intentions between groups post-intervention. Moreover, a limited effect was observed in health behaviour performance with a significant interaction only found between intervention conditions in healthy eating behaviours. Significant differences were found between healthy eating and regular exercise behaviours from time 1 to time 2 of the research programme. Furthermore, behavioural intentions were found to be significant predictors of health behaviours.

# Contents Page

<b>Contents</b>	<b>Page No.</b>
Abstract .....	ii
List of Figures .....	vi
List of Tables.....	viii
Acknowledgements .....	x
Foreword .....	xi
Chapter 1: Aims and Overview .....	1
1.1 Aims .....	1
1.2 Overview of Chapters.....	3
Chapter 2: Introduction .....	6
2.1 Health Behaviours .....	6
2.1.1 Healthy Eating.....	8
2.1.2 Physical Activity .....	15
2.1.3 Tobacco Use.....	18
2.1.4 Alcohol Consumption .....	20
2.2 Parental Influence on Health Behaviours.....	22
2.2.1 Parents as Social Models.....	23
2.2.2 The Family Home.....	25
2.3 Summary .....	29
Chapter 3: Study 1 - Literature Review .....	34
3.1 Promoting Health .....	34
3.1.1 Health Promotion .....	34
3.1.2 Public Health Policies .....	36
3.1.3 Summary .....	40
3.2 Subjective Concepts of Health .....	42
3.2.1 What is Health? .....	42
3.2.2 What is Health Perception? .....	45
3.2.3 Children's Concepts of Health and Causes of Illness .....	46
3.2.4 Instruments Measuring Children's Health Issues.....	51
3.2.5 Summary .....	52
3.3 Theoretical Background .....	54
3.3.1 Social Cognition Models.....	55
3.3.1.1 Health Belief Model.....	56
3.3.1.2 Health Locus of Control.....	57
3.3.1.3 Self-Efficacy Theory .....	62
3.3.1.4 Theory of Planned Behaviour .....	66
3.3.2 Perceived Image .....	69
3.3.3 Theoretical Framework of Study 1.....	71
Chapter 4: Study 1 - Children's Health Perceptions and Health Behaviours.....	75
4.1 Aims and Objectives .....	75
4.2 Literature Review .....	76
4.2.1 Age and Gender Differences in Health Behaviours .....	77
4.2.2 Influential Factors on Children's Health Behaviour .....	78
4.2.3 Summary .....	80
4.3 Research Questions .....	85

4.4 Hypotheses .....	87
4.5 Method .....	90
4.5.1 Design – Study 1 .....	90
4.5.2 Participants – Study 1 .....	92
4.5.3 Materials – Study 1 .....	94
4.5.3.2 Small Scale Pilot Study .....	104
4.5.4 Procedure and Ethical Considerations.....	111
4.6 Results .....	117
4.6.1 Demographic Data.....	117
4.6.2 Reliability Analysis .....	118
4.6.3 Descriptive Statistics of Study Variables .....	122
4.6.3.1 Descriptive Statistics of MSLTc – Health Cognitions .....	123
4.6.3.2 Descriptive Statistics of MTPB– Health Behaviour Perceptions.....	123
4.6.3.3 Descriptive Statistics for Behavioural Intention and Previous Performance .....	128
4.6.3.4 Descriptive Statistics for Parental Health Behaviours .....	134
4.6.4 Year Group and Gender Differences in Study Variables.....	138
4.6.4.1 Modified Social Learning Theory for Children .....	139
4.6.4.2 Modified Theory of Planned Behaviour.....	143
4.6.4.3 Behavioural Intention and Previous Behaviour Performance .....	149
4.6.5 Relationships between Main Study Variables.....	156
4.6.6 Predictors of Health Behaviour Intentions .....	170
4.6.6.1 Testing the Modified Social Learning Theory for Children .....	171
4.6.6.2 Testing the Modified Theory of Planned Behaviour.....	175
4.6.6.3 The Influence of Past Behavioural Experience .....	179
4.6.6.4 The Influence of Parental Health Behaviours .....	180
4.6.7 Testing the Study Variables Combined – Searching for a New Model ..	181
4.7 Discussion .....	189
4.7.1 Age and Gender Differences – Hypothesis 1 and 2 .....	190
4.7.1.1 Modified Social Learning Theory for Children .....	190
4.7.1.2 Health Behaviour Perceptions (MTPB), Intentions and Performance	192
4.7.2 Predicting Health Behaviour Intentions – Hypotheses 3, 4, 5 and 6.....	198
4.7.2.1 The Modified Social Learning Theory for Children (MSLTc) Model	199
4.7.2.2 The Modified Theory of Planned Behaviour Model.....	201
4.7.2.3 Previous Experience .....	202
4.7. 2.4 Influence of Parental Health Behaviours .....	202
4.7.3 Proposition of a New Model – Theory of Health Behaviour Perceptions	203
4.7.3.1 Final Models.....	205
4.7.4 Summary and Limitations of Study 1 .....	207
Chapter 5: Study 2 – Literature Review .....	211
5.1 Health Promotion and Public Health.....	211
5.2 Public Health Campaigns .....	214
5.2.1 Attitude and Communication Theories .....	215
5.2.1.1 Protection Motivation Theory .....	217
5.2.1.2 Message Framing – Prospect Theory .....	219
5.2.2 Children’s Healthy Schools Programme .....	225
5.3 Designing a Public Health Intervention .....	230
5.4 Intention-Behaviour Relationship .....	232
5.4.1 Health Action Process Approach .....	233
5.5 Empowerment Education .....	236

5.6 Summary .....	237
Chapter 6: Study 2 – Promoting Health: An Intervention Approach .....	242
6.1 Aims and Objectives .....	242
6.2 Literature review .....	243
6.3 Research Questions .....	245
6.4 Hypotheses .....	246
6.5 Method .....	247
6.5.1 Design – Study 2 .....	247
6.5.2 Participants – Study 2 .....	249
6.5.3 Materials – Study 2 .....	250
6.5.4 Procedure – Study 2 .....	254
6.6 Results – Study 2 .....	260
6.6.1 Descriptive Statistics .....	260
6.6.2 Baseline Behavioural Intention and Health Behaviour .....	261
6.6.3 Intervention Effects on Health Behaviour Intentions .....	262
6.6.4 Intervention Effects on Health Behaviour Performance .....	267
6.6.5 Intention-Behaviour Relationship .....	272
6.7 Discussion .....	278
6.7.1 Intervention Effects on Health Behaviour Intentions – Hypothesis 1 .....	278
6.7.2 Intervention Effects on Health Behaviour Performance – Hypothesis 2 .....	279
6.7.3 Intention – Behaviour Relationship - Hypothesis 3 .....	281
6.7.4 Limitations to Study 2 .....	282
Chapter 7: Final Discussion and Future Directions .....	286
7.1 Summary .....	286
7.2 Summary of the Findings of the Current Research Programme .....	287
7.2.1 Study 1 .....	287
7.2.1.1 Age & Gender Differences .....	287
7.2.1.2 Predicting Health Behaviour Intentions .....	289
7.2.1.3 Final Models .....	292
7.2.2 Study 2 .....	293
7.2.2.1 Intervention Effects .....	294
7.2.2.2 Intention – Behaviour Relationship .....	295
7.3 Implications of Findings to the Field of Health Psychology .....	295
7.3.1 Healthy Eating Research .....	297
7.3.2 Regular Exercise Research .....	297
7.3.3 Cigarette Smoking Research .....	298
7.3.4 Alcohol Research .....	299
7.3.5 Summary .....	300
7.4 Limitations of the Research Presented in this Thesis .....	300
7.5 Emerging Issues and Directions for Future Research .....	305
7.6 Conclusions .....	308
References .....	311
Appendices .....	345

## List of Figures

<b>Figure Contents</b>	<b>Page No.</b>
Figure 1: Overview of study 1 in the current research programme. ....	76
Figure 2: A diagram of the components of interest in study 1 .....	84
Figure 3: Percentage of responses towards the intention to stick to a healthy diet..	129
Figure 4: Percentage of responses towards the performance of eating healthy foods	129
Figure 5: Percentage of responses towards the intention to exercise everyday .....	130
Figure 6: Percentage of responses towards the performance of exercise behaviours	131
Figure 7: Percentage of responses towards the intention to avoid smoking cigarettes	132
Figure 8: Percentage of responses toward previous experience of smoking cigarettes .....	132
Figure 9: Percentage of responses towards the intention to avoid drinking alcohol	133
Figure 10: Percentage of responses towards the previous alcohol consumption .....	134
Figure 11: Mother's healthy eating behaviour .....	135
Figure 12: Father's healthy eating behaviour.....	135
Figure 13: Mother's exercise behaviour.....	136
Figure 14: Father's exercise behaviour .....	136
Figure 15: Mother's smoking experience.....	137
Figure 16: Father's smoking experience .....	137
Figure 17: Main effects of year group and gender on CHLOC beliefs.....	141
Figure 18: Main effects of year group and gender on generalised self-efficacy beliefs .....	141
Figure 19: Main effects of year group and gender on health value beliefs.....	142
Figure 20: Main effects of year group and gender on perceived own image.....	143
Figure 21: Main effects of year group and gender on perceived importance of healthy eating .....	145
Figure 22: Main effects of year group and gender on attitude toward healthy eating	145
Figure 23: Interactions between year group and gender on healthy eating intentions	151
Figure 24: Interactions between year group and gender on exercise behaviours.....	152
Figure 25: Interactions between year group and gender on intentions to avoid smoking .....	153
Figure 26: Interactions between year group and gender on past smoking experience	154
Figure 27: Main effects of year group and gender on intentions to avoid alcohol ..	155

Figure 28: Main effects of year group and gender on previous alcohol experience	155
Figure 29: Predictor variables produced by stepwise regression analysis (showing standardised beta values in final models and total R <sup>2</sup> ).....	188
Figure 30: Proposed model of Health Behaviour Perceptions .....	206
Figure 31: Overview of study 2.....	243
Figure 32: Main effects of intervention condition and time on healthy eating intentions .....	263
Figure 33: Main effects of intervention condition and time on regular exercise intentions .....	264
Figure 34: Main effects of intervention and time on intentions to avoid cigarettes.	265
Figure 35: Main effects of intervention condition and time on intentions to avoid alcohol .....	266
Figure 36: Interaction effects of intervention condition on healthy eating behaviours .....	268
Figure 37: Main effects of intervention and time on regular exercise behaviours..	269
Figure 38: Main effects of intervention condition on non-smoking behaviours.....	270
Figure 39: Main effects of intervention condition on non-alcohol drinking behaviours .....	271



## List of Tables

<b>Table Contents</b>	<b>Page No.</b>
Table 1: Total number of participants by year group, gender and school.....	92
Table 2: Framework of the Health Perception Questionnaire components .....	94
Table 3: Components of Parts A-G of the Health Perceptions Questionnaire .....	95
Table 4: Feedback information provided from pilot study .....	106
Table 5: Additional feedback from questionnaires in pilot study .....	107
Table 6: Cross tabulation of year group and gender .....	117
Table 7: Health Perceptions Questionnaire subscale reliability analysis .....	119
Table 8: Descriptive data of health cognitions measured by the MSLTc .....	123
Table 9: Descriptive data for perceptions of healthy eating measured by the MTPB	124
Table 10: Descriptive data for perceptions of regular exercise measured by the MTPB .....	125
Table 11: Descriptive data for perceptions of smoking behaviour measured by the MTPB .....	126
Table 12: Descriptive data for perceptions of alcohol consumption measured by the MTPB .....	128
Table 13: Main effects of year group and gender on MSLTc health cognitions .....	139
Table 14: Main effects of year group on MTPB health perceptions of alcohol related behaviours .....	148
Table 15: Main effects of year group and gender on behavioural intentions and previous behaviour experience.....	150
Table 16: Correlations between study variables for healthy eating behaviours.....	160
Table 17: Correlations between healthy eating intentions and study variables split for year group and gender .....	161
Table 18: Correlations between study variables for exercise behaviours .....	162
Table 19: Correlations between exercise intentions and study variables split for year group and gender .....	164
Table 20: Correlations between study variables for smoking related behaviours....	166
Table 21: Correlations between non-smoking intentions and study variables split for year group and gender .....	167
Table 22: Correlations between study variables for alcohol related behaviours.....	168

Table 23: Correlations between intentions to avoid drinking alcohol and study variables split for year group and gender .....	169
Table 24: Results of multiple regression analyses for components of MSLTc model (standardized beta and R <sup>2</sup> change values).....	174
Table 25: Results of multiple regression analyses for components of MTPB model (standardized beta and R <sup>2</sup> change values).....	176
Table 26: Results of multiple regression analyses for previous behavioural experience (standardized beta and R <sup>2</sup> change values).....	179
Table 27: Results of multiple regression analyses for parental health behaviours (standardized beta and R <sup>2</sup> change values).....	181
Table 28: Results of stepwise multiple regression analysis for healthy eating intentions .....	184
Table 29: Results of stepwise multiple regression analysis for exercise intentions.	185
Table 30: Results of stepwise multiple regression analysis for intention to avoid smoking .....	185
Table 31: Results of stepwise multiple regression analysis for intention to avoid alcohol .....	186
Table 32: Intervention workshop schedule .....	253
Table 33: Standardized dialogue used to introduce the intervention workshops.....	255
Table 34: Discussion themes and frequency in positive and negative framed intervention workshops .....	256
Table 35: Cross-tabulation of intervention groups by year group and gender.....	260
Table 36: Results of multiple regression analyses for intention-behaviour relationship for healthy eating (standardized beta and R <sup>2</sup> change values).....	273
Table 37: Results of multiple regression analyses for intention-behaviour relationship for regular exercise (standardized beta and R <sup>2</sup> change values).....	275
Table 38: Results of multiple regression analyses for intention-behaviour relationship for avoiding smoking cigarettes (standardized beta and R <sup>2</sup> change values)	276
Table 39: Results of multiple regression analyses for intention-behaviour relationship for avoiding drinking alcohol (standardized beta and R <sup>2</sup> change values)	277

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## Foreword

Treating ill health is expensive for the UK government. Figures from the Department of Health in 1998 show that heart disease, stroke and related illnesses cost the NHS an estimated £3.8 billion every year. White papers such as 'The Health of the Nation' (1992) and 'Saving Lives: Our Healthier Nation' (1999) proposed to save lives, promote healthier living and reduce inequality in health. By 2010 the current UK government's targets are to reduce the death rate in people under 75 from cancer by at least a fifth and from coronary heart disease by at least two fifths. If these targets are achieved, it is estimated that up to 300,000 premature deaths would be prevented.

However, seven years on from when these targets were published, the proportion of deaths from these two illnesses continues to rise now being accountable for around two-thirds of all deaths (Department of Health, 2004). Individuals can improve their health and prevent premature death through a good diet, regular physical activity, avoiding smoking cigarettes, and drinking alcohol in moderation. It is clear from these government health policies that their aims are to improve the population's health. However, it is also clear that information alone is not sufficient to motivate individuals to take the best care of their health, and that human behaviour is much more complex.

The field of Health Psychology aims to understand, explain, and develop theories to test the role of psychological factors in the maintenance of health, quality of life and causes of illness. Many of the key areas the Government wishes to target are associated with behavioural and social risk factors, which in principle are answerable to psychosocial interventions. However, although behavioural change is a major aim

for these policies, there is no reference to the role of psychologists or psychological intervention.

Public Health Campaigns based on these policies are predominately mass media campaigns often using so-called 'fear appeals'. Such fear appeals are based on the assumption that behaviour change will result from fear induction. However, the empirical evidence available on the efficacy of this approach is mixed; changing an individuals' behaviour to a healthier alternative is notoriously problematic. To simply expect behaviour change when presented with information or a threat of disease or illness is naïve. In many cases, fear appeals work in the opposite way, and lead to such a strong emotional reaction that the individual does not deal with the threat, and often leads to the denial that the threat even applies to them (Franzkowak, 1987; Soames-Job, 1988).

Studies investigating the prevalence of unhealthy behaviours show that knowing about health risks does not tend to influence the performance of them (Macfarlane et al, 1987). The importance of psychological factors such as perceived control in promoting healthy choices should not be ignored. Primary prevention efforts capitalise on opportunities to prevent poor habits from developing. It is, therefore, important to focus those efforts on children. There has been a vast amount of research in the past evaluating health behaviours in children and adolescents and factors associated with why they may perform them. However, there is limited research focusing on young peoples *perceptions* of such behaviours. Gaining an understanding into how children perceive health behaviours, and what factors may influence this perception such as the

child's immediate social environment, would give health promotion campaigns a much stronger basis in terms of helping young people to make healthy choices.

As a result of the publication of *Saving Lives: Our Healthier Nation*, in 1999 the Government set up a Healthy Schools Programme with the aim of promoting health and emotional well-being in order to support young people in improving their quality of life, both now and in the future. Linked to this initiative, the Department of Health and the Department for Education and Employment jointly sponsored a project examining the health needs of school-aged children (Kurtz & Thornes, 2000). This study revealed that although children wanted to learn about health risks, they were unsure of who to ask. They wanted access to people they could trust, who would allow them to explore their feelings openly, and who they felt were comfortable talking about such matters. They felt they could not trust their teachers and that the school nurse was there for immunisations and dealing with minor accidents. This lack of support is a major problem within schools and the health care system today. There is an urgent need to target children's health needs, before they become the next generation of coronary heart disease patients.

Health Psychology is a rapidly growing field. Nevertheless, there seems to be a lack of Health Psychologists actually implementing their expertise within primary health care. Many can be found within academia, teaching the importance and properties of health psychology, and a few can be found within hospitals, aiding the quality of life in patients with diseases such as cancer and coronary heart disease. However, Health Psychologists implementing intervention programmes for the promotion of health are infrequent and few.

The study of behaviours that influence health, and the factors determining which individuals will and which individuals will not perform such behaviours is an important area of research for the health of the nation. It is on these principles that this thesis is based.

# Chapter 1: Aims and Overview

## 1.1 Aims

The overall aim of this thesis is to investigate cognitive factors that may contribute to health behaviours in children and their intention to perform them in the future and examine the extent to which a framed intervention could enhance such behaviours.

More specifically, this research programme aims to:

- review current trends of children's health behaviours specific to age and gender, with reference to their eating and exercise behaviours, and their tobacco and alcohol use.
- establish through a review of the literature the process of health promotion in children and discuss the success of recent national strategies.
- examine how health and health behaviours are perceived by children and how this perception is constructed.
- evaluate the cognitive components within a child's health behaviour perception in an attempt to identify if they may predict the performance and intention to perform these health behaviours.
- identify whether children's observations of their parents' health behaviours have any influence over their engagement with the same behaviours.
- investigate whether the frame of an intervention package could enhance previous health behaviour intentions and performance.



- investigate the predictive power of behavioural intentions on the performance of health behaviours.

In detail, this research programme asks the following questions:

1. Do children's health cognitions, health behaviour perceptions, intentions and practices differ:

- a) between year group?
- b) between boys and girls?

2. Can children's health behaviour intentions be predicted by:

- a) their health cognitions
- b) their health behaviour perceptions
- c) their own past experience or performance of the behaviour
- d) their observations of the health behaviours of their parents

3. Can an intervention programme based on psychological theories enhance a child's intentions towards certain health behaviours, and if so what frame of intervention works best?

4. Can an intervention programme based on psychological theories enhance children's actual health behaviours, and if so what frame of intervention works best?

5. Does a child's intention to perform certain health behaviours predict the health behaviours they actually perform?

## **1.2 Overview of Chapters**

This thesis is presented in 7 chapters. Following this first chapter, Chapter 2 introduces the prevalence of the health behaviours of interest in this research programme. It evaluates previous research investigating contributing factors to children's healthy eating, exercise behaviours, tobacco use, alcohol use, and discusses parental influence. The chapter concludes with a summary of previously reported results on age and gender differences within the performance of these health behaviours and the timely need for further research of potential psychological determinants of these behaviours.

Chapter 3 reviews definitions of health promotion, and the success of government provisions in enhancing the health of the nation is critically discussed. The chapter then examines concepts of health and how they are constructed through childhood. While attempting to investigate how children's perceptions influence behaviours relevant to health, it was first important to review how children conceptualise health itself. Following this, the most widely used and accepted theoretical constructs for health behaviour research are introduced and their application to the health behaviours of young people evaluated. The chapter ends by drawing together the perceptual components reported through the literature as being the most significant predictors of behavioural intentions and health behaviours.

Chapter 4 presents the first study of the current research programme. The cognitive components identified in the literature as the most significant predictors of health behaviour and behavioural intentions are examined and two modified health cognition models are proposed. Past health behaviour experience and parental health

behaviours observed by the child are also investigated. A cross-sectional design is employed, addressing the first two research questions posed in this chapter examining; 1) whether children's health cognitions, health behaviour perceptions, intentions and practices differ between age and gender and 2) whether children's health behaviour intentions are predicted by their health cognitions, health behaviour perceptions, past behaviour and observations of the health behaviours their parents perform.

Chapter 5 introduces strategies and theoretical models most commonly used in the area of health promotion. This chapter, therefore, brings together literature in the areas of both public health and health promotion. Recent strategies aimed at promoting health are introduced and discussed and the success of government provisions in enhancing the health of the nation are critically evaluated with specific reference to behaviour change interventions. Programmes developed specifically for children are identified and evidence is presented suggesting that more work is required in this area. The need for a health promotion strategy based on substance other than mere information is highlighted, with the view that the promotion of health behaviours in children is an area worthy of further exploration. This chapter further reviews the literature that empirically investigates how well health behaviour intentions are translated into behavioural actions. The chapter concludes with an evaluation of health promotion campaigns that aim to enhance health behaviours and successful approaches based on theoretical models are discussed.

Further to the literature introduced in Chapter 3 and the findings reported from study 1, Chapter 6 reports on the second study in the research programme. Study 2

endeavours to fill a void in the literature that attempts to link theoretical work to practical intervention. This second study addressed the final three research questions presented in this chapter examining the extent to which; 1) an intervention programme based on psychological theories could enhance children's intentions towards certain health behaviours, and if so what frame of intervention works best, 2) an intervention programme based on psychological theories could enhance children's actual health behaviours, and if so what frame of intervention works best, 3) a child's intention to perform certain health behaviours predict the health behaviours they actually perform. Using a sub-sample of study 1, study 2 follows the children through several time-lines, measuring first their health behaviour intention and then their actual behaviour performance one week on. These measurements are taken before and after an experimental intervention workshop designed specifically for the age groups in the research programme. Children were randomly allocated to one of three intervention conditions; a positive message frame, a negative message frame and a control condition. The chapter ends by discussing the findings of the effectiveness of the intervention workshops on health behaviour intention and health behaviour enhancement and the predictive value of a health behaviour intention on behaviour performance.

Chapter 7 provides a summary of the research programme, bringing together findings from study 1 and study 2. It then moves on to critically evaluate the work presented in previous chapters, stating its limitations and relevance to previous studies in the area. The chapter concludes by identifying new research questions drawn from the present studies, and suggests the direction of future research.

## Chapter 2: Introduction

*“Our health is strongly determined by what we do or don’t do, what we eat, what we drink, how we live and work, and how our society is structured. Changing behaviour is not a simple matter”*

*(Kerr, Weitkunat & Moretti, 2005).*

The last few decades have shown an increased recognition that good health is something that is actively achieved by people through a healthy lifestyle, and should not be taken for granted. Good health has become a symbol of aspiration, determination and personal control, and a means to the achievement of personal goals such as a long life and physical attractiveness (Brownell, 1991).

### 2.1 Health Behaviours

Matarazzo (1984) has defined health behaviours in terms of their health-protective or health-impairing characteristics. Behaviours with health-protective properties were termed ‘behavioural immunogens’ (e.g. eating healthy foods, taking regular exercise and gaining adequate sleep at night); whereas those which pose health risks were termed ‘behavioural pathogens’ (such as smoking, eating foods high in fat and drinking large amounts of alcohol). Health behaviours are generally regarded as behaviours which are related to the health status of the individual (Taylor, 1995).

There is research evidence that suggests there are seven health behaviours related to health status (Belloc, 1973; Breslow & Enstrom, 1980). This evidence was drawn from a correlational analysis examining the relationship between mortality rates and

health behaviour in a sample of 7000 participants. The seven behaviours reported to be significant for health status are sleeping 7-8 hours a day, having breakfast every day, not smoking, rarely eating between meals, being near or at prescribed weight, having moderate or no use of alcohol, and gaining regular exercise (Belloc,1973; Breslow & Enstrom, 1980). Furthermore, the performance of behaviours that have been found to enhance or maintain good health differ according to demographic variables, such as age and gender. Findings suggest that the practice of health behaviours such as those mentioned above are more commonly practiced by younger, more affluent, better educated individuals who have access to a good support network (Gottlieb & Green, 1984). High self esteem has also been implicated as a determinant of good health behaviour practice (Lau & Klepper, 1988).

It is suggested that health behaviours are related to economic performance, as a healthier workforce improves productivity and performance (Department of Health; DoH, 1999). It is currently estimated that in England in 1995, around 20 million working days were lost as a result of ill-health (DoH, 1999). Focusing on the economic cost of this loss in productivity, alcohol misuse alone is costing England an estimated £6.4bn per year (Eaton, 2004). Through improving health and reducing health behaviours related to preventable illnesses, such as a poor diet, lack of exercise, smoking cigarettes and alcohol misuse, it seems apparent that productivity could be improved. Productivity will inevitably be preserved with the reduction of employees taking '5-minute cigarette breaks', or tardy work as a result of physical effects related to poor nutrition or overindulgence of alcohol.

Research encompassing health behaviours is often based on two assumptions: 1) in modern western countries a significant proportion of the mortality from the leading causes of death is due to certain behaviour patterns, and 2) that these behaviour patterns can be altered (Stroebe & Stroebe, 1995). In 1998 it was estimated that almost 90,000 people die every year before reaching their 65<sup>th</sup> birthday in England alone, and of these, nearly 32,000 died of cancer, and 25,000 died of heart disease, stroke and related illnesses (DoH, 1999). Since this date, the proportion of deaths from these illnesses has continued to rise now being accountable for around two-thirds of all deaths (DoH, 2004). As mentioned previously, many of these deaths are preventable through a good diet, regular physical activity, avoiding smoking cigarettes, and drinking alcohol in moderation.

### **2.1.1 Healthy Eating**

An estimated one in three deaths from the leading causes of mortality is attributable to a poor diet (DoH, 2004). Diet is central to health throughout life. A healthy diet during pregnancy is important for the development of the unborn child, as well as a balanced diet during childhood for the healthy development of children, and the prevention of obesity. Good nutrition throughout life, with plenty of fruit and vegetables, fibre, and low levels of fatty, sugary and salty foods, will help protect against coronary heart disease, stroke, diabetes and cancer (Kumanyika, Horn, Bowen, Perri, Rolls, Czajkowski & Schron, 2000; World Health Organisation, WHO, 1990). The '5 A DAY' campaign recommends that individuals should try to eat five portions of fruit and vegetables a day (DoH, 2003; WHO, 1990). One portion is a piece of fruit, a bowl of salad, two spoonfuls of vegetables or a glass of fruit juice. The fruit and vegetables can be fresh, frozen or tinned (DoH, 2003).

Recent figures confirm that children are consuming less than the recommended fruit and vegetable portions per day (Glynn, Emmett, Rogers & the ALSPAC Study Team, 2005; Todd, Currie, Smith & Small, 2000). On average, consumption is under half (2 out of 5) the recommended daily amount, with children from the lowest social economic status groups eating 50% less than those from a high group (Gregory & Lowe, 2000; DoH, 2005). Fruit consumption in childhood is salient for health status and is suggested to have long-term protective qualities on cancer risk in adulthood (Maynard, Gunnell, Emmett, Frankel & Davey Smith, 2003). Research has found that children understand what 'healthy eating' means (Turner, Zimvraiki & Athanasiou, 1997), and the importance of balance and moderation (Dixey, Sahota, Atwal & Turner, 2001). Nevertheless they often do not translate this knowledge into action (Sherratt, 1996; Johnson & Hackett, 1997) and a reported 9 percent of girls and 26 percent of boys have been reported to show no interest in learning about health and nutrition at all (Misra & Aguillon, 2001).

Eating behaviours are reported to differ significantly by gender (Todd et al, 2000; Misra & Aguillon, 2001) with girls reporting higher levels of healthy eating behaviours, such as fruit intake than boys (Glynn et al, 2005; Todd et al, 2000). In contrast, boys perceive themselves to be healthier than girls (Misra & Aguillon, 2001). Furthermore, a significantly higher proportion of boys than girls eat breakfast everyday (Todd et al, 2000). Little evidence has been found for age related differences in healthy eating behaviours, with studies reporting insignificant age-effects on dietary behaviours (Misra & Aguillon, 2001). However, the consumption of fruit, vegetables, rice and pasta has been found to increase in 11-15 year olds in surveys from 1990 through to 1998 (Todd et al, 2000). Although this change is



welcomed, a reported decline in the daily intake of milk and a significant increase in the daily consumption of hamburgers, sausages and chips is concerning (Todd et al, 2000), particularly with reference to the increasing prevalence of obesity among children (Reilly, Dorosty, & Emmett, 1999; Fox, 2003; DoH, 2004).

Eating habits are found to be related to social class and household income (Kurtz & Thornes, 2000; DoH, 2005; Gregory & Lowe, 2000). Measured on the Registrar General's Social Class Scale, the proportion of children frequently consuming fruit and vegetables was found to decrease from social classes I/II (I= professional, e.g. doctors, II= managerial/technical, e.g. managers/teachers) to IV/V (IV= partly skilled, e.g. security guards, V= unskilled, e.g. labourers), and from higher to lower income households, while the proportion consuming sweet foods, soft drinks and crisps increased. These observed differences may be related to a number of interacting factors including parental education, social norms (Lamerz, Kuepper-Nybelen, Wehle, Bruning, Trost-Brinkhues, Brenner, Hebebrand & Herpertz-Dahlmann, 2005) and availability of fresh produce that may be limited due to financial constraints. In an attempt to tackle these economic differences, the government has pledged in its current white paper, "*Choosing Health*" (DoH, 2004) that they will help poorer families make informed choices within a healthy living framework. However, it can be argued that although such policies and consequent health promotion campaigns have some advantage to low-income families, they fail to fully address the influence of structural, social and emotional factors that have an effect on diet and nutrition.

A developmental approach to eating behaviour emphasizes the importance of learning and experience, focusing on the development of food preferences in childhood. The development of food preferences has been explained through three psychological concepts: exposure, social learning and associative learning. During infancy, children are thought to develop a neophobic response (fear of new foods), which has been described as a 'developmental phase' that is innately ingrained from our ancestors at a time when it may have served as a protective function when foraging for food (Martins, 2002). It is thought that this response was programmed unconsciously as a type of survival mechanism, which reduced the likelihood of unintentionally eating a harmful toxin. This belief may, therefore, lead to a natural apprehension regarding foods with a strong flavour. In present day, this phobia is short-lived if children are exposed to a variety of foods at a very early age (Martins, 2002). Social learning describes how observing other people's behaviour through modeling has an impact on behaviour (Bandura, 1986). Children presenting with food refusal have been found to be positively influenced by videos of 'food dudes' who were enthusiastically eating refused food (Lowe, Dowey & Horne, 1998). There is also evidence to suggest that parents influence their children's eating preferences and behaviours, with strong correlations found between mothers' and children's food intakes in pre-school children (Olivera, Ellison & Moore, 1992). Associative learning refers to eating through reinforcement in line with operant conditioning. Research has shown that rewarding eating behaviour seems to improve food preferences (Birch, Zimmerman & Hind, 1980).

Eating patterns can have an effect on cognitive and physical performance, mood, energy levels and physical attractiveness (O'Dea, 2003). Studies have provided

evidence that adolescents ascribe greater importance of a healthy diet to their looks, weight, appearance and energy levels compared to the prevention of future illness (Nowak & Crawford, 1998; Normandeau, Kalnins, Jutras & Hanigan, 1998). This suggests that the promotion of short-term benefits of healthy eating (such as appearance) would be an effective method to use when attempting to improve eating behaviour. Empirical evidence further suggests that while adolescent's knowledge of healthy eating is well informed, they perceive too many barriers to eat healthily which consequently results in the consumption of unhealthy foods (Croll, Neumark-Sztainer & Story, 2001; Story & Resnick, 1986).

### ***Diet and Obesity***

The prevalence of obesity has trebled since the 1980's and over half of all adults are now either overweight or obese (Reilly et al, 1999; Fox, 2003; DoH, 2004). This equates to almost 24 million adults resident in England alone. Reporting on the epidemiological trends of obesity (using the measure of Body Mass Index – BMI), the Health Survey for England 2004 found that since the last annual survey, there was no significant change in the proportion of adults who were classified as overweight, however, a marked increase in the proportion who were obese (BMI over 30). The proportion of individuals classified as obese has increased from 13.2 percent of men and 16.4 percent of women in 1993 to 23.6 percent of men and 23.8 percent of women in 2004 (NHS Health and Social Care Information Centre, 2005).

Figures also show an increasing number of overweight children in England (DoH, 2004), and it seems obesity has become a childhood problem throughout the UK. Patterns of behaviour are often set early on and influence health throughout the life-

span. In particular, childhood and young adulthood have been identified as critical stages in the development of habits that will affect health in later years (DoH, 2004) with childhood obesity being reported as a strong predictor of obesity in later life (Whitaker, Wright, Pepe, Seidel & Dietz, 1997). The National Centre for Social Research (2005) reports that the proportion of overweight children (including those who are obese) has increased from 22.7 percent in 1995 to 27.7 percent in 2003. The prevalence of obesity among children aged between 2-10 years rose from 9.9 percent in boys and 10.3 percent in girls in 1995 to 14.9 percent in boys and 12.5 percent in girls in 2003 (Jotangia, Moody, Stamakakis, & Wardle, 2005). In addition, a significantly higher proportion of obese children (19.8%) were coming from a family where both parents were overweight or obese, compared to those obese children (8.4%) with only one parent overweight or obese, and obese children (6.7%) with neither parent measuring as overweight or obese (Jotangia et al, 2005). The government has warned that if the prevalence of childhood obesity continues to rise, today's children will have a shorter life expectancy than that of their parents (DoH, 2004). Further studies have reported that children whose parents were overweight, and who were in the top weight quintile at birth were more likely to be in the top BMI quintile through childhood (Reilly et al, 1999).

Research examining the causes of obesity is often contradictory, perhaps as a result of the vast individual differences among those with weight problems. There is some agreement, however, that obesity may be related to a genetic pre-disposition, over-consumption of fat and under-activity (Vögele, 2005; Ogden, 2004). Obesity occurs when energy intake exceeds energy expenditure (Vögele, 2005). The regulation of the balance between energy intake and energy expenditure is influenced by a

multitude of factors. One possible hypothesis that may explain fluctuations in energy intake is the Restraint Theory (Herman & Mack, 1975; Polivy & Herman, 1985). This theory suggests that when an individual attempts to regulate their weight by their eating behaviours through deliberate control (dietary restraint), they begin to ‘unlearn’ internal signals of hunger and satiety. This intention to restrain eating may be disrupted or 'disinhibited' by certain events, such as dysphoric mood, alcohol, or the availability of appetising foods (Ruderman, 1986). Which, in turn, may explain why individuals attempting to restrict their eating, frequently overeat (Williamson, Lawson, Brooks, Woznaik, Ryan, Bray & Duchmann, 1995). There is evidence to suggest a link between dieting and binge eating. Both normal-weight women with bulimia nervosa and low-weight women with anorexia nervosa who engage in binge eating almost invariably report that dietary restriction preceded their binge eating (Yanovski, 1995). Normal eating is generally under the control of appetite (Kendall & Hammen, 1998), people often stop eating when they feel full. Restrained eaters, however, are thought to ignore (or have unlearned) biological signals of hunger and fullness, and instead eat when they believe they should eat. The Restraint Theory (Herman & Mack, 1975; Polivy & Herman, 1985) postulates that by externally regulating food intake through dieting, obese individuals no longer respond to internal cues for satiety, and are, therefore, prone to disinhibition (eating more as a result of the loosening of restraints in response to emotional distress, intoxication, or preloading) of their eating. Eating behaviours are therefore affected by physiological and psychological processes relating to hunger, satiety, dietary restraint and disinhibition (see Vögele, 2005 for a full review).

Children as young as nine years old have been found to have concerns over their weight, reporting dietary restriction as a means to control their body shape (Hill, Oliver & Rogers, 1992; Hill, Draper & Stack, 1994; Vögele & Woodward, 2005). The desire to be thinner is frequently reported in overweight children (Rolland, Farnhill & Griffiths, 1996), and a high proportion of normal weight girls report restrained eating behaviours (Hill et al, 1994). Pre-adolescent girls (aged 9 years) have been found to confuse healthy eating with dieting (Hill & Silver, 1995) and with reported links between adolescent dieting and the onset of eating disorders (Hill, 1993) this is an area of great concern. It seems a clear distinction needs to be made between healthy eating behaviours and dietary restriction with children. Healthy eating initiatives may benefit by emphasizing the short-term gains of eating well, such as physical attractiveness, rather than the long-term costs to health, such as chronic illness.

### **2.1.2 Physical Activity**

Physically active adults have a significantly lower age-adjusted mortality rate from coronary heart disease and cancer (Hu, Tuomilehto, Silventoinen, Barengo, Peltonen & Jousilahti, 2005, Hardman, 2001), with a 20-30 percent reduced risk of premature death and up to 50 percent reduced risk of these major diseases (DoH, 2004). Little attention, however, has been given to the potentially protective nature of childhood activity against such diseases (Biddle, Gorely & Stensel, 2004). However, it is generally accepted that similar benefits are true for children (Biddle, Cavill & Sallis, 1998). Widespread belief does suggest that physical activity is inherently ‘good’ for young people with respect to a variety of psychosocial outcomes. These include self-esteem, mood and cognitive functioning (Biddle et al, 2004). Other benefits of

physical activity include control over weight, blood pressure and diabetes, and protection against osteoporosis (Warburton, Nicol & Bredin, 2006). A physically active lifestyle can come from a number of activities including walking, cycling and participating in sports. It has been recommended that for general health benefit, people should achieve at least 30 minutes of moderate physical activity five times a week (DoH, 2004b). These levels can be achieved during one daily session, or a number of short bouts of activity of 10 minutes or more.

Physical activity has been found to be steadily decreasing among school-aged children (Fox, 2003) due in part to over 155 schools having no access to a playground (Kurtz & Thornes, 2000) and a drop in children walking to school from 72 percent in the 1970's to 59 percent in the year 1999 (Department of the Environment, Transport and the Regions (DETR), 1999). During 1986 to 1996 the number of children walking to school reduced by 29 percent (DETR, 1999). This decline in active commuting to school has been reported to be due to an increase in the reliance of vehicles for transportation, with 50 percent of British children (aged between 4 to 11 years) being driven less than a mile to school on a regular basis (Sleap & Warburton, 1993).

Self-report surveys support the notion of a decline of physical activity in young people, showing at the age of 14-15 years 38 percent of girls were doing no physical activity at all, with boys reporting some exercise (Kurtz & Thornes, 2000). Misra and Aguilon (2001) further report physical activity differing by age and gender. In a study of 124 high school students, boys displayed higher levels of physical activity than girls and younger children had higher activity levels than older children (Misra

& Aguilon, 2001). Differences in physical activity by gender in favour of boys' behaviour are further supported in large-scale studies investigating health behaviours of Scottish schoolchildren (Todd et al, 2000) and physical activity behaviours during adolescence (Kimm, Glynn, Obarzanek, Kriska, Daniels, Barton & Liu, 2005; Must, 2005). The engagement in activity behaviours could have major implications for health practices in adult life. Longitudinal research has found that physical activity in childhood (ages 9 to 18 years) is a significant predictor of physical activity in adulthood (Telama, Yang, Viikari, Wanne & Raitakari, 2005).

It has been reported that low levels of physical activity are associated with greater perceived barriers to exercise (Biddle et al, 2004). Physical activity has also been shown to increase with the intention to perform exercise behaviours and preferences to them (Biddle et al, 2004). Cavill, Biddle and Sallis (2001) suggest that physical activity may also be related to perceptions of enjoyment, self-efficacy, competence, control and autonomy, positive attitudes towards activity, and a perception of fewer barriers and many benefits. The transition to secondary school has been reported as a time where barriers to physical activity emerge. Qualitative research suggests an increase in embarrassment and self-consciousness of physical appearance during this transition (especially in girls). Perceived time pressures due to increases in academic work have also been reported to act as a barrier to physical activity (Mulvihill, Rivers & Aggleton, 2000).

The worrying reality of the declining figures of childhood physical activity is enhanced by societies' acceptance of them, with some schools reporting the provision of seats in playground areas for children to sit on during their daily break-times (Vögele, 2005). There is no doubt that the sedentary lifestyle of recent years is



becoming widely adopted. A large proportion of 6-17 year olds spend on average two and a half hours a day in front of the television, and play computer games for prolonged periods of time (Kurtz & Thornes, 2000). This lack of exercise in young people is alarming. Inactivity in childhood has significant links with childhood obesity (Kimm et al, 2005; Dietz & Gortmaker, 1985; Must 2005) with reports that adolescents spending 5 hours or more a day watching television are 4.6 times more likely to be obese than those who watch 2 hours or less per day (Chaput, Brunet & Tremblay, 2006; Gortmaker, Must, Sobol, Peterson, Colditz & Dietz, 1996). In sum, evidence suggests there are significant differences in the physical activity patterns of children, with higher levels of exercise associated with boys and younger children.

### **2.1.3 Tobacco Use**

Smoking is the UK's single greatest cause of preventable illness and early death with more than 12,000 people in the UK dying from smoking each year (DoH, 2004). Furthermore, individuals who start smoking before the age of 16 years are three times more likely to die of a smoking-related cancer compared to those who begin smoking in their early twenties (Doll & Peto, 1981). Country-wide figures show that there are approximately 26 percent of adults, and between 9 percent to 14 percent of 11-15 year olds who are currently smokers (DoH, 2004; Nahit, Fielder, Charlton, Povey & Mudde, 2003). Analysis from the Health Survey for England 2003 shows that there has been a gradual decline in smoking prevalence since 1994 within the adult population. The number of male smokers have dropped from 29 percent in 1994 to 27 percent in 2003 and females smokers have reduced from 27 percent 1994 to 24 percent in 2003 (Sproston & Primatesta, 2003). However, although the health

risks related to the behaviour are widely known, there is increasing concern over the number of children who start smoking.

Macfarlane, McPherson, McPherson and Ahmad (1987) found that, of 650 14-17 year olds surveyed, 98 percent knew that smoking harmed their health, however, one in five were or had been smokers. Estimations from the Department of Health (1998) suggest that for every 1,000 20-year old smokers, 250 will die in middle age, and another 250 will die in older age from a smoking related disease. The likelihood of smoking in adulthood is associated with smoking initiation at a younger age (Breslau & Paterson, 1996). From the age-specific rates in England, the British Heart Foundation has estimated there are just under 300,000 regular smokers aged 11-15 years in the UK today (Peterson, Peto & Rayner, 2004). In a study of school-aged children (aged 5-18 years), 13 percent of boys and 14 percent of girls aged 15 years reported regular smoking (defined as smoking at least one cigarette a week). The proportion of young smokers then increased dramatically between the ages of 16 to 18 years from 20 percent to 40 percent in young men, and 25 percent to 41 percent in young women (Kurtz & Thronnes, 2000). These findings are supported in a study of 3,019 Swedish children (Galanti, Rosendahl, Post & Gilljam, 2001) that found that smoking prevalence increased significantly with age, especially in girls. Using cotinine levels to detect smoking behaviour it was found that smoking hardly started before the age of 11 years, however, from here it rose steeply (Kurtz & Thronnes, 2000). Both cotinine levels and self-report data show there are relatively low levels of smoking among young people living in households of social class I, and high levels among those living in households of social class V. Gender differences are further supported elsewhere, with girls reporting higher levels of smoking behaviours

than boys (Nahit et al, 2003; Faucher, 2003). The prevalence was also found to be lower in children living in privately owned property, and higher in children living in social housing (Kurtz & Thornes, 2000). Furthermore, higher levels of smoking was reported in children aged 13-15 years who were living in households where at least one adult smoked (24%), than in households where no adult smoked (7%) (Kurtz & Thornes, 2000).

Interestingly, the behaviours mentioned previously with regards to eating, such as dietary restraint and weight control have been found to be significantly correlated with smoking onset (Tomeo, Field, Berkey, Colditz & Frazier, 1999) and smoking status (Camp, Klesges & Relyea, 1993). From a sample of 16,862 children (aged 9 to 14 years), experimentation with cigarette smoking (initiation) was associated with an attempt to control weight in boys, and purging and dieting behaviours in girls (Tomeo et al, 1999). Furthermore, the maintenance of cigarette smoking has also been reported to be related to eating behaviours in young people, with 39 percent of girls and 12 percent of boys (N=659) reporting they smoke cigarettes to control their appetite and weight (Camp et al, 1993). From the evidence presented here, it seems there are age and gender-related differences in cigarette smoking behaviours with the uptake significantly increasing with age and reported at a higher level in girls than boys.

#### **2.1.4 Alcohol Consumption**

The use of alcohol in moderation is accepted within society. Current government guidelines advise that daily drinking should not regularly exceed 4 units for men and 3 units for women, with the additional guidance of a number of alcohol-free days

(DoH, 1995). The 2004 Health Survey for England shows the proportion of men and women who had not exceeded this limit on the heaviest days drinking was relatively stable over time, with 33 percent of men and 32 percent of women having consumed alcohol within these limits in 2004 (NHS Health and Social Care Information Centre, 2005). The misuse of the substance, however, can lead to a number of medical conditions. Chronic drinkers, as defined by the Alcohol Harm Reduction Strategy are individuals consuming large amounts of alcohol regularly (DoH, 2004c) are at an increased risk of cirrhosis of the liver, cancer, stroke, premature death and suicide. Furthermore, actions taken under the influence such as drink driving can often be fatal. In 1996, 15 percent of fatal road accidents involved alcohol (DoH, 1998). In 2002, 7 percent of men's and 3 percent of women's usual weekly alcohol consumption was more than 51 units and 36 units respectively (DoH, 2004c). Heavy drinking is harmful not only to individuals, but also to their families and to society as a whole. Its effects can lead to mental health problems including depression, and families can be affected by stress, domestic violence and neglect (DoH, 2004). The misuse of alcohol has been associated with 22,000 deaths each year (DoH, 2004) and world-wide, 5 percent of all deaths of young people between the ages of 15 and 29 years of age (Murray & Lopez, 1997). To add to these disturbing figures, in 1999 over 50,000 young people living in Europe died from alcohol-related causes (WHO, 2001).

Like smoking, there is growing concern over the amount of alcohol being consumed by children and young adults, and the current trend of 'binge drinking'. Binge drinking is commonly perceived as drinking large amounts of alcohol in a relatively short space of time. It has been reported that 25 percent of children aged 11-15 years

drink alcohol at an average of around 10 units per week (DoH, 2004). Statistics on Alcohol for England published in 2004 show that in 2003 the amount of children drinking alcohol (defined as having at least one drink in the last week) increased sharply with age, with only 6 percent of pupils aged 11, compared with 49 percent of those aged 15 (DoH, 2004c). In the same year, the mean alcohol consumption of those pupils aged 11 to 15 who had drunk in the last seven days was 9.5 units. This also increased by age, from 7.1 units among 11 to 13 year old drinkers, to 11.3 units among 15 year olds. In all age groups boys had consumed more alcohol than girls of the same age (12.9 units compared with 9.8 units in the last week for 15 year olds) (DoH, 2004c). In a separate study (Kurtz & Thornes, 2000), children reporting having consumed a whole alcoholic beverage in their lifetime, increased from 5 percent of boys and 4 percent of girls at age 8 years, to 71 percent of boys and 72 percent of girls at age 15 years. The prevalence of reported drinking in the past week of the study in boys increased from 20 percent at age 13 to 29 percent at age 14 and 44 percent at age 15. The prevalence of reported drinking in the past week of the study in girls remained stable at 15 percent for ages 13, 14 and 15 years (Kurtz & Thornes, 2000). These figures, therefore, suggest there are substantial differences in alcohol consumption between age groups and to a lesser extent between boys and girls, with older children consuming a significantly higher amount of alcohol to younger children, and boys drinking more alcohol than girls.

## **2.2 Parental Influence on Health Behaviours**

The influence of parents and primary caregivers on their child's intentions to perform health-enhancing and health-impairing behaviours is of great interest. To what extent does parental behaviour influence the behaviours of their children?

### **2.2.1 Parents as Social Models**

Health beliefs are strongly affected by early socialisation, with the home being one of the most influential learning environments for children and young people. Parents and other caregivers provide powerful models (Lau, Quadrel & Hartman, 1990). The early influence of primary caregivers imparts a long, perhaps life long, influence on their children's behaviour. This can produce a strong impact on health promotion in children by establishing norms for factors such as food choices and exercise intake (Duffy, 1988). Parental beliefs, attitudes, knowledge and skills are thought to influence motivation and ability, by providing opportunities for health enhancing behaviours to their children (O'Dea, 2003). This can, however, form a strong barrier to preventing poor health habits from developing.

Research evidence points to the fact that parents who smoke are significantly more likely to have children who smoke (Chassin, Presson & Rose, 2005; Murray, Swan, Johnson & Bewley, 1983), obese parents are more likely to have obese children (Danielzik, Czerwinski-Mast, & Langnäse, 2004), and the children of problem drinkers are more susceptible to alcoholism (Green, MacIntyre, West, & Ecob, 1991). Furthermore, studies have repeatedly demonstrated that parental substance use is a significant predictor of adolescent substance use (Li, Pentz & Chou, 2002). The relationship between parental and child behaviour may operate via different routes depending on the nature of the problem area. There is a probable interaction of genetic, hereditary, and environmental factors in all cases of parental influence. However, the differential contribution may differ between behaviours and individuals. The focus of the present research programme is on parental influence via social cognitive factors. Social Learning Theory (Bandura, 1986) explains the

relationship between parental and child behaviour by means of a direct influence of role modelling on adolescents' outcome expectations and beliefs about the consequences of their own behaviour. With reference to substance use, role modelling is proposed to influence both adolescents' self-efficacy to try a substance (use self-efficacy) and their self-efficacy to refuse offers of a substance (refusal self-efficacy). These cognitions will be discussed in detail in Chapter 3.

Research investigating parental substance use as a modifier of adolescent substance use in 1807 sixth and seventh grade American pupils (aged 11-13 years) found that parental substance use had a significant effect on adolescent substance use at an 18-month follow-up (Li et al, 2002). The substances examined in this study were cigarettes, alcohol and marijuana, with the pupils reporting by proxy on their parents substance use. Parents who did not use substances were found to have a buffering effect on the influence of their child's peers, such that the substance use by friends did not affect adolescent use when the parents were non-users. The study concluded that parental substance use should be addressed in prevention programmes targeted at adolescent substance use, and non-use by parents should be reinforced (Li et al, 2002). Parental smoking behaviour is also reported to be a significant predictor of smoking onset, although the smoking status of peers is also shown to have a significant influence (De Vries, Engels, Kremers, Wetzels & Mudde, 2003). It has been argued, however, that the smoking status of a friend is significant due to the peer group the child chooses to identify with (Ennett & Bauman, 1994). Cross-sectional analysis of 15,705 adolescents supports this notion revealing that friends' smoking behaviours showed the strongest association with the smoking status of the adolescent accounting for 38 percent of the variance. However, longitudinal analysis

of the same sample revealed parental smoking behaviour was as predictive as the smoking behaviour of friends (De Vries et al, 2003). A review of 87 studies investigating familial influences on adolescent smoking behaviours (Avenevoli & Merikangas, 2003) found that the studies that reported significant parental influence were often presenting relatively small effects. Furthermore, the effect of parental smoking on the smoking behaviours of their adolescent children was eliminated when other variables such as peer influence were included into the analysis (Avenevoli & Merikangas, 2003).

Although genetic susceptibility could be implicated in some of the relationships mentioned above, environmental learning and economic influence could be equally important. Interestingly, evidence from focus groups with children (mean age 7 years) have themselves suggested one rationale for smoking is parental modelling with girls stating “*when they [children] learn, they learn off the mum and dad if they learn to smoke*” and boys reiterating “*because their dad smokes, they might say its good for them*” (Porcellato, Dughill & Spingett, 2002). Effects of parental modelling have provided mixed results, however, those that report a positive effect on children’s health behaviours such as exercise and smoking avoidance are thought to be partly due to the parents instilling perceptions of competence in their children (McElroy, 2002) and their disapproval of the behaviour (Sargent & Dalton, 2001).

### **2.2.2 The Family Home**

The family unit acts as a source of transmission for many factors, including social, biological, and cultural (Avenevoli & Merikangas, 2003). The family home has changed over the past several decades, with a dramatic increase in the number of



dual-career and single parent families (Todd et al, 2000; Misra & Aguilon, 2001). This increase, however, is not correlated with the availability of child-care for dependant children, which leads to the conclusion that many school-aged children are caring for themselves over significant periods of time (Richardson, Dwyer, McGuigan, Hansen, Dent, Johnson, Sussman, Brannon & Flay, 1989). Although there is no data to determine the exact number of children who regularly care for themselves, estimates for those younger than 13 years of age range from 2-6 million (Richardson et al, 1989). Because parents act as gatekeepers to both opportunities and barriers to engage in various lifestyle practices, decreased parental supervision for many children has serious implications for the role of children in their own self-care and health behaviour management (Graham & Uphold, 1992).

There is a higher rate of health problems reported in young people who are experiencing conflict with their parents. In a study of children in West Scotland (Sweeting & West, 1996), it was found that associations between health problems and the family unit were related to the amount of time the child had spent with the rest of their family before the age of 16 years. Those who had spent more time with their family were less likely to smoke or to have tried illicit drugs before the age of 18 years. In young women, they were also less likely to become pregnant. It is believed a strong attachment or bond with the child and their parent(s) can act as a powerful protective factor for a range of risk behaviours in children and adolescents (Fonagy, Target, Cottrell, Kurtz, & Kurtz, 2000). In support of this notion, Wen, Tsai, Cheng, Hsu, Chen and Lin (2005) report a significant influence of parental smoking status and perceived “tender loving care” (TLC) towards their adolescent child’s (aged 15-18 years) own smoking behaviours. From a sample of 44,976,

results showed that parental influence played a greater role to that of peer influence when both the health behaviour and perceived care they give their child was taken into account. The highest smoking rates were exhibited by adolescents whose parents were smokers and who perceived a low level of TLC. Furthermore, adolescents with non-smoking parents who felt a high level of TLC reported the lowest levels of smoking behaviour. Family functioning has also been shown to have an influence on adolescent smoking, with adolescents from a family with low cohesion whose parents smoke exhibiting twice the rate of smoking in late adolescence to those in a stable family (Doherty & Allen, 1994).

There is growing concern over the role parents play in their children's health. Studies have reported a lack of interest shown by parents towards topics related to health. For example, on occasions when children have been assigned a homework activity to do with their parents on a health related topic, some parents have shown disinterest and watch television while their child works alone (Kurtz & Thornes, 2000). In such instances, there is no transmission of knowledge to the parents from such an exercise. Unfortunately, this is seen as a major problem within the current generation of parents, as children are being taught healthy initiatives at school, and parents seem to be getting their information largely from media channels such as television (Kurtz & Thornes, 2000).

The association between health and families is also shown through economic variables. Children living in poverty are at a significantly higher risk of poor health than those who are comfortable financially. One in three children in Britain live in poverty equating to more than 4 million children. This figure is up from 1.3 million

in 1979 (Kurtz & Thornes, 2000). In half of the households of poor children neither parent is employed. When compared internationally the UK has the highest level of unemployment among families with children. It has been reported that the income needed to maintain good health and child development is substantially above that provided in the UK by income support or the proposed minimum wage (Kurtz & Thornes, 2000). This could have a significant impact on the ability of low-income families to buy quality fresh food. Bosma, Van de Mheen and Mackenbach, (1999) studied the adult population in the South-East of the Netherlands investigating associations between their health and socio-economic variables in their childhood. Findings suggest that poor health in adulthood was related to a higher prevalence of unhealthy psychological attributes (e.g. personality characteristics and coping styles) in those who grew up in households with a low social economic status. Moreover, self-rated poor health was associated with external locus of control, neuroticism, and the absence of active problem-focused coping (Bosma et al, 1999).

The interpersonal relationship between children and their parents is important for many reasons. However, as the child ages, these relationships seem to become more distant. A survey conducted in the United States of 200 school-age students and their parents found that parents are unaware of their child's involvement in health-risk behaviours (Young & Zimmerman, 1998). Parents substantially underestimate their children's smoking, drinking, drug taking, and sexual activity, and often perceive they have no control over their child's future uptake in behaviours such as smoking (Clark, Scarisbrick-Hauser, Gautam & Wirk, 1999). The distance between children and the adult world can often be reinforced in schools where they learn about issues such as healthy eating and are then presented with unbalanced meals in the school

canteen (Story, Kaphingst & French, 2006; Noorani, 2005). This can be a problem, not just in relation to confusing messages, but also as parents often regard this as the main meal of the day for their children (Kurtz & Thornes, 2000). It is more common than not for parents to provide unbalanced diets for their children at home, perhaps because of the expense of fruit and vegetables, or perhaps because of the time involved in preparation. Most children no longer eat meals at a table; from a class of 30 students, 10 sat down for a meal, while the remaining 20 ate their dinner off their laps (Kurtz & Thornes, 2000). Many parents would like to see the school encompassing a more parenting role with the option of breakfast at school (Shemilt, O'Brien, Thoburn, Harvey, Belderson, Robinson & Camina, 2003).

### **2.3 Summary**

Research reporting on the prevalence of behaviours, such as those of interest in this research programme (i.e. healthy eating, physical activity, smoking cigarettes and alcohol consumption) within the general population for both adults and children is vast. However, such research does not tend to consider psychological variables, nor control for parental influence. From a social learning perspective (Bandura, 1986), which encapsulates the role of modeling, reinforcement and positive expectations, the question arises as to what role parental health behaviours play in the development of children's health behaviour intentions. As mentioned previously, the family unit acts as a source of transmission for many factors, including social, biological, and cultural (Avenevoli & Merikangas, 2003), that may contribute to the development of individual differences. A major aim in government efforts such as obesity reduction or substance use prevention, is to determine the influence parents have over their children's health behaviour, or perhaps more importantly, their intentions towards it.

Integral to this research is an investigation of the direction of children's health behaviour intentions. To what extent may a child veer towards abstinence or uptake in light of their parents' health behaviours? For example, while research evidence points to the fact that children of smokers are more likely to smoke, it could also be possible that a child of a smoker, could disapprove of the smoking behaviour as they may have seen the detrimental effects it has had on their parents. Similarly, a child brought up in a household where fast food and/or a sedentary lifestyle are the norm may either adopt these patterns or establish alternative health-related behaviours. Much of the research conducted on the health habits of children with parents who exhibit poor health behaviours have been documented at the point when these poor habits have already become established in the children. Answers to these types of questions could inform current school-based prevention programmes that, at present, emphasise the influence of peer pressure towards such behaviour. It is noted that the behaviour of peers can significantly influence the health behaviours of young people (De Vries et al, 2003; Avenevoli & Merikangas, 2003). However, there is a need to determine whether programmes addressing peer pressure are sufficient or whether there is a need to also address parental involvement and influence.

As health behaviours seem to be important in predicting mortality and the longevity of individuals, health psychologists attempt to understand and predict health-related behaviours. Leventhal, Prochaska and Hirschman (1985) described a number of factors that are believed to predict health-related behaviours, such as social factors (e.g. modelling or social norms), genetics, emotional factors (such as fear), perceived symptoms (e.g. pain), and the beliefs of the patient and health professionals. While

there is a wealth of epidemiological data examining the health behaviours of children, little is known about psychological factors that may influence health behaviour decisions (Lohaus, Klein-Hessling, Ball & Wild, 2004). While it is acknowledged that children do not live in a 'vacuum' that is detached from such a multitude of influences, it is beyond the scope of the current research programme to investigate all these factors. This series of studies will therefore focus on children's cognitions towards the health behaviours discussed in this chapter and social factors that may influence their intention to perform such behaviours. Additionally, for adolescents short-term outcomes associated with image such as physical attractiveness are frequently reported as important factors in health behaviour, therefore, this is a further area worthy of investigation.

In summary, the health behaviours reported in this chapter have been found to differ significantly by age and gender. Recent figures confirm that children are consuming less than the recommended fruit and vegetable portions per day (Glynn et al, 2005; Todd et al, 2000; Gregory & Lowe, 2000; DoH, 2005). Furthermore, empirical evidence suggests that healthy eating behaviours are higher in girls when compared to boys (Glynn et al, 2005; Todd et al, 2000; Misra & Aguillion, 2001).

Physical activity has been found to be steadily decreasing among school-aged children (Kurtz & Thornes, 2000) with data suggesting 38 percent of girls aged between 14-15 years of age are taking no physical activity at all, with boys reporting some exercise (Kurtz & Thornes, 2000). Physical activity is more frequent in boys than girls (Todd et al, 2000; Misra & Aguillion, 2001) and is found to significantly decrease with age (Misra & Aguillion, 2001; Kimm et al, 2005).

Government figures show that 9 percent of 11-15 year olds are current smokers (DoH, 2004). This equates to approximately 300,000 children currently smoking cigarettes in the UK today. Smoking behaviours are reported to be higher in girls than boys (Nahit et al, 2003; Faucher, 2003), and significantly increases with age (Faucher, 2003; Galanti et al, 2001; Kurtz & Thornes, 2000).

It is reported that 25 percent of 11-15 year olds drink up to and over the recommended adult weekly benchmark of alcohol (DoH, 2004). Furthermore the consumption of alcohol is dramatically influenced by age, increasing from 6 percent at age 11 years to 49 percent at age 15 years (DoH, 2004c), with boys consistently drinking more alcohol than girls (DoH, 2004c, Kurtz & Thornes, 2000).

Studies with children report that they are aware of the health protective effects of health-enhancing behaviours such as healthy eating (Turner et al, 1997; Dixey et al, 2001). Children also show appreciation for the negative effects of health-impairing behaviours such as smoking cigarettes (Macfarlane et al, 1987). Nevertheless, this knowledge is often not transformed into action (Sherratt, 1996; Johnson & Hackett, 1997; Macfarlane et al, 1987). Research investigating parental influence on their child's health behaviours has provided mixed results (Li et al, 2002; De Vries et al, 2003; Avenevoli & Merikangas, 2003). With evidence suggesting the possible influence of parental behaviours is diminished when other factors are taken into account (Avenevoli & Merikangas, 2003). The perceived gap between the adult and the child world has led to parents being unaware of their child's health-risk

behaviours (Young & Zimmerman, 1998). This leaves parents with a sense of no control over the behaviours their children choose to perform (Clark et al, 1999).

The observed link between the protective effects of health-enhancing behaviours such as healthy eating (Kumanyika et al, 2000; WHO, 1990) and physical activity (Hu et al, 2005; Hardman, 2001; DoH, 2004), coupled with the increased health risk of health-impairing behaviours such as smoking (DoH, 2004; DoH, 1998) and alcohol misuse (WHO, 2001; DoH, 2004c; Murray & Lopez, 1997) on the mortality and morbidity of the leading causes of death such as coronary heart disease and cancer must not be overlooked. The health of young people is an increasingly topical area of public and political interest. The empirical evidence presented here shows there are significant age and gender differences within the health behaviours of interest in the current research programme. There also appears to be a disparity between children's health knowledge and health practices. Therefore, it seems pertinent to investigate such demographic differences in the current research programme with a focus on health behaviour perceptions and intentions thus adding to the research literature in an attempt to contribute to the current lack of investigations pertaining to psychological influences of children's health behaviour performance.



## Chapter 3: Study 1 - Literature Review

*“Health promotion and illness prevention are not simply two sides of the same coin”*

*(Vögele, 2005b).*

### 3.1 Promoting Health

*“It is not enough to treat people when they fall ill, more must be done to prevent them from falling ill in the first place...”* (DoH, 1999). The important process of enabling people to increase control over and improve their health is known as health promotion (WHO, 1984). A salient aspect of health promotion planning is the analysis of significant determinants of health behaviours (Kok, Den Boer, De Vries, Gerards, Hospers & Mudde, 1992).

#### 3.1.1 Health Promotion

There is some debate over the interchanging use of the terms health education and health promotion. Health education relates to the aim of increasing an individual’s knowledge about factors that may affect their health status, therefore, mere education. However, over previous decades this approach and definition has gained wide-scale criticism as being too restrictive, portraying an emphasis on ‘victim blaming’. In contrast, the term health promotion encompasses individual education into a process that facilitates the health status of individuals, groups and whole populations. Such a process takes into account more than just knowledge and beliefs, such as structural aspects of the environment (Vögele, 2005b). This could include public health policies and initiatives.

From the viewpoint of the individual, health promotion refers to the practice of health-enhancing behaviours, such as a balanced diet, low in cholesterol and fat, regular exercise, and the practice of preventive health behaviours such as breast and testicular self-examination and condom use. It also refers to the avoidance of health-impairing behaviours, such as excessive alcohol consumption, smoking and drug use. From the viewpoint of health care professionals such as health psychologists and health practitioners, health promotion refers to efforts to intervene with healthy rather than ill populations for the purpose of enhancing and maximising good health (Taylor, 1995). A unifying theme across these behaviours is that they have immediate or long-term effects upon the individual's health and are at least partially within the individual's control (Connor & Norman, 1995).

Health promotion and primary prevention efforts capitalise on educational opportunities to prevent poor habits from developing. It is, therefore, important to focus those efforts on young adults or children. Preventive child health care could prevent diseases and disability, and would be more cost-effective in the long-term than therapeutic medicine and surgery. Many disorders that affect adults can be reduced or eliminated during childhood (Kumanyika et al, 2000; Telema et al, 2005). An important goal of primary prevention research is to identify the optimal point in the child's developmental trajectory when they are ready to learn about health-enhancing versus health-impairing behaviour. Very young children have cognitive limitations that keep them from fully comprehending the difficult and often highly abstract concepts of health promotion (Eiser & Kopel, 1997). Health beliefs that are

important to the development of healthy practices have been shown to develop by the age of 11 or 12 years (Maddux, Roberts, Sledden & Wright, 1986).

Initial health habits tend to develop during late childhood and adolescence (Curtis, 1992). From the perspective of the young person, behaviours such as poor nutrition, lack of exercise, smoking cigarettes and drinking alcohol appear to have little or no apparent effect on health and physical functioning (Taylor, 1995). This belief is reflected in the low levels attributed to perceived vulnerability and health value reported in childhood (Gochman, 1987) and the reluctance to learn about health-enhancing behaviours such as healthy eating (Misra & Aguilon, 2001). The cumulative effect of health-impairing behaviours, however, may cause health problems in later life. This gap between childhood behaviour and the long-term consequences for health could act as a barrier for health promotion strategies, as few children or adolescents are concerned about their future health at 40 or 50 years old (Taylor, 1995). For this reason, it is important to focus on perceptions of health behaviours in younger years and how such psychological cognitions influence children's intentions towards health behaviour. Knowledge of cognitions that may significantly effect, or even predict health behaviour intentions could help inform future health promotion initiatives.

### **3.1.2 Public Health Policies**

The effectiveness of health promotion lies both at a micro level with the individual, and at a macro level with the society. In response to growing concern by health professionals, organisations and the general public, the need for a formulated set of policies for improving health was established. The United Kingdom's Government

launched a white paper in July 1992 named *The Health of the Nation* (HOTN), which was devised to reduce high-risk behaviours as a strategy for national health gain. The HOTN set targets in five key areas: coronary heart disease and stroke, cancers, mental illness, HIV/AIDS and sexual health, and accidents. Each key area had an objective that related to the aims of the HOTN.

The objective for the key area coronary heart disease (CHD) and stroke was to reduce the level of ill health and death caused by the two, and the risk factors associated with them. CHD accounted for about 26 percent of deaths in England in 1991. It was both the single largest cause of death, and main cause of premature death. Strokes were responsible for approximately 12 percent of all deaths in 1991 (DoH, 1992). Risk factors associated with these diseases include smoking, which accounted for up to 18 percent of CHD deaths and 11 percent of stroke deaths, eating and drinking habits, which includes the most important risk factor for CHD, plasma cholesterol, and lack of physical exercise. Success in achieving all the targets within this area would have not only reduced the number of CHD and stroke fatalities, it would also have led to improvements in many other conditions. For example, a reduction in smoking prevalence and excessive alcohol consumption would lower the risk of certain cancers (DoH, 2004), and a reduction in obesity should reduce the risk of non-insulin dependent diabetes (WHO, 1990).

The key area targeting cancers aimed to reduce ill-health and death caused by breast, cervical, skin and lung cancer. Cancers were and still are the second most common cause of death (DoH, 2004), accounting for 25 percent of the deaths in 1991 (DoH, 1992).

In 1992 *The Health of the Nation* (DoH, 1992) forecast significant changes in the prevalence of smoking, high-fat diets and alcohol consumption in an attempt to reach these targets, yet the research literature suggests that health education programmes designed to promote ‘healthy choices’ based on this report, failed to provide the changes that are recognised as desirable (Marks, 1994). Subsequently, in 1998 the UK government launched a green paper on public health, *Our Healthier Nation*, which proposed a ‘Contract for health’. In addition to past initiatives that emphasised empowering people to live healthy lives by changing their lifestyle, this paper focused attention on structural inequalities, such as poverty, and aimed to improve people’s living conditions and health. This paper moved away from previous victim blaming, to state that “*Good health is no longer about blame, but about opportunity and responsibility*” (DoH, 1998). It promised that information given to the public is accurate, comprehensible and credible. Furthermore, it stated that local Health Authorities will identify community needs and translate the national contract into local action. The contract called for the Government, local communities and individuals to join together in partnership to improve all health. Three settings were identified for action, (1) healthy schools, which focused on children, (2) healthy workplaces, which focused on adults, and (3) healthy neighbourhoods, which focused on older people. The healthy schools programme with specific reference to children will be discussed in more detail in Chapter 5.

In 1999, the subsequent white paper, *Saving Lives: Our Healthier Nation* was introduced which confirmed the aims of the previous green paper to save lives, promote healthier living and reduce inequality in health. The paper *Saving Lives: Our Healthier Nation* (DoH, 1999) set targets to reduce the death rate of people

under 75 years of age from cancer, accidents, mental illness, coronary heart disease and stroke by 2010. Figures from the 1998 green paper *Our Healthier Nation* show that these five areas account for more than 75 percent of all deaths before the age of 75 years. If these targets were achieved, it was estimated up to 300,000 premature and unnecessary deaths would be prevented. The government at this point stated it is *"re-activating a dormant duty of the NHS - to promote good health, not just treat people when they fall sick"* (DoH, 1999).

Seven years on from when these targets were made, however, the proportion of deaths from CHD and cancer continues to rise now being accountable for around two-thirds of all deaths (DoH, 2004). It is clear from these government health policies that their aims are to improve the population's health. However, it is also clear that information alone is not sufficient to motivate individuals to take the best care of their health, and that human behaviour is much more complex.

Reporting on the patterns of research activity investigating child and family health in 2002/2003 based on these policies, Hawkins and Law (2005) report only a limited amount of projects were funded to research these areas. From their analysis of major research funders only 3 percent of budgets were accountable for research activity into issues relating to child and family health. Within this funding area, only 12 percent represented primary and secondary prevention, and 14 percent investigating children and adolescents at high risk of ill health. Hawkins and Law (2005) conclude the need for further research to be commissioned to fill the current gaps in these salient research areas. These findings were, however, drawn from a web-based survey and may not truly represent the total research activity in the area of children's

health and family. The NHS is reported to spend around £420 million a year on research, however, it is felt “*academic public health is not as rigorous as we would like to see it*” (DoH, 1999).

The most recent UK Government report entitled *Choosing Health: Making Healthy Choices Easier* (2004) places an emphasis on making it easier for people to choose healthy lives by making ‘informed choices’. To do this the policy states the government will; give people good information so they can make their own choices about their health (for example, whether or not to smoke), help people from poorer communities to make positive choices about health, and attempt to reduce the number of individuals buying unhealthy food, cigarettes and alcohol, especially children and young people. The policy emphasizes the government’s protective role stating they aim to “*strike the right balance between allowing people to decide their own actions while not allowing those actions to unduly inconvenience or damage the health of others*” (DoH, 2004). The Wanless Report (2004) reiterates the significant role for government in public health. It notes that “*individuals are ultimately responsible for their own and their children’s health*”, but that government “*has a responsibility... to judge whether and to what extent it should intervene... to improve social welfare and population health*”. The report also concedes that individuals do not always behave rationally, suggesting justifiable reason for government to try ‘shifting social norms’ through avenues such as health services.

### **3.1.3 Summary**

Treating ill health is expensive for the UK government. Heart disease, stroke and related illnesses cost the National Health Service (NHS) an estimated £3.8 billion

every year (DoH, 1998). As discussed in Chapter 2 behavioural risk factors of such illnesses are becoming an increasing concern in childhood. By preventing avoidable illnesses through the modification of behavioural risk factors money can be concentrated on resources for treating conditions which cannot yet be prevented. The government has acknowledged that research plays a major role in helping to understand the causes of ill health, therefore, the current research programme is both a worthy and timely investigation. It seeks to provide insight into cognitive factors that may influence young peoples' decisions to engage in health behaviours that have been found to have an influence on health status throughout life.

Late childhood and adolescence are reported as the developmental period when habitual health behaviours are formed (Curtis, 1992). This is also the age when young people begin to develop beliefs important to health promoting activities (Maddux et al, 1986). The apparent gap between health behaviour and health consequences for children (Taylor, 1995), coupled with the low value placed on health and perceived vulnerability to illness (Gochman, 1987) suggests an important time in the child's developmental trajectory to investigate cognitive factors that may influence health behaviour decision making. A salient aspect of health promotion is the analysis of the determinants of health behaviours (Kok et al, 1992). In doing this it is important to establish how a child's perception of health develops and what cognitions are significant in the prediction of health behaviours. Evidence from such an investigation can help inform public health policies such as those mentioned in this chapter, providing an insight into the significance of psychological factors in children's health behaviour decision making.



## 3.2 Subjective Concepts of Health

*“Health is an ill-defined, general concept that holds different meanings for different people”*

*(Walker, 1993).*

### 3.2.1 What is Health?

It seems quite late in the text to be asking the question ‘What is health?’, however, it is a question which seems pertinent to address in any health behaviour research. There seems to be a lack of literature that attempts to define and generate images of health. The term ‘health’ is commonly used without reflection on its meaning. Cox (1987) reported from a UK survey of 9,000 adults that 30 percent provided a definition with reference to ‘no disease’ or ‘not ill’. Images of disease, illness and death are common, however, images of health are more difficult to find. The reason for this may be that health does not have a clear identity of its own. The experiences of disease and illness are intense and tend to have a certain temporal prognosis. This allows them to become objects of attention, with the ability to generate images. Being healthy on the other hand, might just be a way of describing a state free from illness or disease. The medical profession seems to support this view, in that when treatment restores health, it is often removing disease or illness (Downie & Macnaughton, 1998). Being healthy could refer to a biological balance or bodily equilibrium (Lyons & Chamberlain, 2006), however, when people are in this state of ‘health’ it may go unnoticed, perhaps, as there is nothing *to* notice.

The 1947 WHO (World Health Organisation) definition of health states that; *“Health is a state of complete physical, mental and social well-being, and not just the*

*absence of disease and infirmity*". This definition has seen much criticism as it does not give health a clear identity anymore than the 'absence of disease' or the 'equilibrium' views. It is believed that the concept known as 'positive health' is in perpetual disguise. Downie and Macnaughton (1998) have stated "*It is conceptually impossible to distinguish positive health from other states such as well-being, happiness, exhilaration, fitness, or vigour*". Thus, images of health will not be found unless they are looked for under other descriptions. It seems health is a multifaceted concept, and cannot be captured by a single definition. It is acknowledged, however, that whatever guise it appears, health is regarded as a value (Downie & Macnaughton, 1998).

It may, therefore, be best to capture the concept of health with regards to lay perceptions of health and social representations. However, again it is found that studies focusing explicitly on social representations of health are rare. Many focus on health and illness (Stainton Rogers, 1991), often with a specific reference to an illness (Jodelet, 1991). One exception is the work of Flick (2000). Flick used the theory of social representations (introduced by Moscovici, 1961/1976) to evaluate health concepts in two countries, Germany and Portugal. Using qualitative methods data was gathered by asking questions such as 'What is 'health' to you?' and 'In your opinion, who should be responsible for your health?' Findings from this study revealed different forms of health awareness in the two cohorts. Flick (2000) interprets these differences in terms of the political and cultural backgrounds of the study participants. The central phenomenon that reappeared in interviews with Portuguese women was *lack of awareness*. It seems in Portugal, there is a general perception that people do not care for themselves. One interviewee stated "*I think*

*that awareness is missing in the lives of the people, not only in their eating, but also that they do not regularly visit the doctor*". Respondents showed knowledge in health-enhancing behaviours. However, they felt that they lacked initiative and motivation. This phenomenon could be likened to beliefs in external locus of control or low self-efficacy which will be discussed later in the chapter. Flick (2000) suggests that the government contributes to the phenomenon producing barriers to health care through providing insufficient information and fails to motivate people to care for their health. In contrast, in the German interviews, the central phenomenon was the feeling of being 'forced to health'. Respondents felt they were only accepted into their society if they were healthy, and that those who were ill were viewed as outsiders. One interviewee stated "*A healthy, active, sportive human being is desired and is well accepted in the society. And people with an illness, they are marginalized...*". The German interviewees repeatedly stressed the importance of sport and healthy eating for their health status. Although these reported expectations were seen as demanding, the German respondents felt that health can be obtained if individuals take responsibility for their own health (Flick, 2000). These beliefs are likened to those with internal locus of control beliefs or high self-efficacy.

Such cross-cultural differences and the apparent governmental influence are interesting and lend support for the need to address social influences over health promotion, with a greater emphasis towards personal control over health. It has been shown in research with children that the more normative a particular behaviour is perceived to be, the more likely children are to engage in such behaviour, or contemplate engaging in the behaviour should the opportunity arise (Gibbons, Gerrard & Boney-McCoy, 1995). Qualitative research has provided evidence that

definitions of health depend on the age of the respondent (Millstein & Irwin, 1987). When asked to define 'health', younger children focus on the internal states of health such as 'feeling good'. In contrast, older children emphasise the psychosocial aspects of health and illness describing what they would be able to do.

*'Health is an ill-defined, general concept that holds different meanings for different people'* (Walker, 1993). There is no certainty of health attached to health enhancing and preventive health behaviours. Eating a healthy diet, exercising regularly, and abstaining from cigarettes or alcohol do not guarantee future health. In contrast, although potentially harmful in the long-term, health risk behaviours such as smoking a cigarette or drinking alcohol provide immediate and certain gratification (Goldberg & Fischhoff, 2000) with no obvious harm to current health status. It may be the case that individuals only value their health once they are in danger of losing it or have already lost it. This may be a significant problem in terms of preventing children's initiation or performance of such 'gratifying' behaviours.

### **3.2.2 What is Health Perception?**

Health perceptions refer to individuals' comprehension and reflection on health (Sholkamy, 1996). They are thought to influence people's health behaviour and their decisions about when to ask for help (Mahasneh, 2001). Collecting information on children's health perceptions and behaviours could provide public health providers with a broader understanding of their lifestyles, health needs and concerns.

There is uncertainty in the literature as to what exactly health perception is, and how this multi-dimensional concept can be measured. It is evident from the literature

reviewed here that empirical evidence proclaiming to measure behavioural effects of ‘health perceptions’ can be confusing if the construct of a health perception is not fully explained. A similar state of confusion occurs when interpreting research that examines ‘health related behaviours’ without reference to the particular behaviours under investigation. Many researchers have opted for qualitative methods for gathering data on health perceptions. Mahasneh (2001) for example, used a semi-structured interview technique, measuring health perceptions by asking participants to describe their health at present, in general and as compared with other individuals. This method of investigation can be truly advantageous, as it can generate in-depth data. However, there are also disadvantages, as one participant may have a completely different *perception* of what ‘health’ is compared to another. This may then reduce the generalisability of the information collected to the wider population. It seems important, therefore, to have a more structured quantitative approach towards the collection of data on health perceptions, with specific objectives of measurement, such as cognitive structures.

### **3.2.3 Children’s Concepts of Health and Causes of Illness**

With regard to age, studies on health concepts in children and adolescents are sparse (Bengel, Bucherer, Strittmatter & Bugge, 1995). Children and adolescents see health as a ‘natural resource’ and take it for granted in everyday life. They see health and illness as two distinct concepts, even though there seems to be some overlap (Bengel et al, 1995). Giskes, Patterson, Turrell and Newman (2005) found that Australian adolescents perceive health to be related mainly to their physical body and its functioning, as well as the absence of ill health and physical restriction. When looking specifically at healthy eating, they found that adolescents focused heavily on

the negative elements of ‘what not to do’, rather than positive factors of ‘what to do’. A balanced diet was perceived as something that should ‘limit high-fat, high sugar or “treat” foods’, that did not skip breakfast, and avoided eating frozen, canned, packaged, dried or “junk foods”. This emphasis on the perception that to eat healthily you must avoid the ‘bad’ foods deflects the encouragement and enjoyment of eating health-enhancing or ‘good’ foods such as fruit, suggesting the frame of the perception needs to be challenged to one that encapsulates the positive factors of eating behaviours. The perception that frozen and canned food should be avoided may also need to be clarified, as the ‘5 A DAY’ campaign states fruit and vegetable intake can be fresh, frozen or tinned (DoH, 2003). Normandeau, Kalnins, Jutras and Hanigan (1998) also found that children’s perceptions of good health included the importance of being functional (sports, absence of disease). Physical health and a healthy diet were also seen as important criteria for good health. While age differences were reported for concepts of health and health behaviours, socio-economic factors and gender were not found to have a significant effect (Normandeau et al, 1998).

Woods, Springett, Porcellato and Dugdill (2005) investigated children’s understanding of health problems associated with passive smoking. A sample of 250 primary school children between the ages of 4 and 7 were reported to express negative feelings towards the exposure of cigarette smoke, with many stating they would challenge people (especially their parents) who smoked around them. Few, however, were seen to take an active role in removing themselves from the situation (Woods et al, 2005).

As the concept of health is imbalanced in the literature, it may be worthwhile evaluating children's concept of illness, as it is thought they are two concepts at either end of a continuum (Natapoff, 1978). Recent examinations of the development of illness concepts have been placed in the context of Piaget's (1930, 1970) general theory of cognitive development (Hergenrather & Rabinowitz, 1991; Tinsley, 1992). From this perspective it is generally agreed that the illness concepts of children in the pre-operational stage (before 7 years of age) are undifferentiated, logically circular, and superstitious. There seems to be confusion between cause and effect, and a lack of differentiation between different types of illness. During the concrete operational stage (7-11 years) children's illness concepts are thought to be more accurate and specific, related to common ideas about illness. They understand the role of contagion and germs in the aetiology of illness, though, at least during the early part of this stage, are confused about issues of proximity and how illnesses are transmitted (Eiser & Kopel, 1997). Finally, children at the formal-operational stage (around 11 years) appear to understand generalised principles of infection, health maintenance, and treatment (Bibace & Walsh, 1980). A number of studies appear to support this theoretical analysis (Hergenrather & Rabinowitz, 1991; Tinsley, 1992; Bibace & Walsh, 1980; Eiser & Kopel, 1997). In sum, younger children offer less complex explanations and rely less on internal bodily cues to indicate the presence of illness. Older children offer more restricted definitions of specific illnesses and a more organised description of process and cause (Eiser & Kopel, 1997).

The earliest studies concerning children's understanding about illness report that children believe illness is punishment for misbehaviour (Beverly, 1936; cited in Hergenrather & Rabinowitz, 1991). This belief has continued through the decades,

with more recent studies confirming previous findings. Kister and Patterson (1980) for example, found that kindergarten and first-grade students were more likely than fourth-grade students to think a cold, a toothache, and a scraped knee were all the result of misbehaviour. Some children, however, believe all illnesses are contagious. Brewster (1982) found that the majority of the 7-10 year old children studied believed all illnesses were caused by germs and that the individual had no responsibility for becoming ill. Other studies suggest that after the age of 9, children's concepts of the causes of illness appear to include ideas about contagion and infection, the malfunctioning of internal organs or systems, and behaviours, attitudes, and feelings (Hergenrather & Rabinowitz, 1991). As knowledge of illness processes increase, children's causal concepts expand to include notions about secondary infection, genetics, poor health habits, and contagion. Therefore, with knowledge acquisition, children's concepts about the causes of illness change from primarily behavioural in nature to the idea that contagion is the single cause of all illnesses and finally expand to include multiple causes (Hergenrather & Rabinowitz, 1991).

It has been argued that few children characterise illness in terms of diagnosis (Millstein, Adler & Irwin, 1981), with changes in social functioning showing greater importance (Giskes et al, 2005). For example, Mechanic and Hansell (1987) suggest that the physical health evaluations of children and adolescents primarily depend on feelings of well-being and being able to participate in school and sports. A lack of experience with negative health events and a low level of the perceived health threat of certain behaviours are reported to contribute to children's often unrealistic, optimistically biased health-risk perception (Greening, Stoppelbein, Chandler &



Elkin, 2005). This may in turn desensitize potential health risks and may minimise the impact of so called 'fear-appeals' that attempt to motivate behaviour change by fear arousing communications. These issues will be discussed in more detail in Chapter 5.

Empirical evidence confirming the influence of age, gender and parental influence on children's health behaviour concepts is limited. This is a focal point of the current research programme. Children's understanding of health promotion and maintenance develop in the formal-operational developmental stage at around 11-12 years of age (Bibace & Walsh, 1980), with this understanding developing through adolescence. Although it is reported that children as young as 3 or 4 years old can comprehend health behaviours such as choosing nutritionally sound foods and participating in exercise, this comprehension relies on an explanation that is highly concrete, with clear implications and examples of good health practices (Maddux, Roberts, Sledden & Wright, 1986). As discussed in Chapter 2, the health behaviours of interest in this research programme have been found to be significantly affected by age and gender, with additional mixed findings describing parental influence. With increasing age there is a reduction of health-enhancing behaviours such as exercise and an increase in various health-impairing behaviours such as smoking and alcohol use. The current research programme will, therefore, investigate children at 11-12 years of age, and children later in adolescence at age 14-15 years of age to examine whether there is a significant difference between these two age groups in their perceptions of health behaviours and the intention they give towards health behaviour performance.

### **3.2.4 Instruments Measuring Children's Health Issues**

The search for a quantitative instrument suitable to appropriately measure components of interest in the current research programme was largely unsuccessful. To the author's knowledge there is currently no instrument which attempts to directly measure children's health behaviour perceptions. However, from a large-scale literature search of sources relating to the development and evaluation of child/parent-assessed measures of health related quality of life, a meta-analysis by Schmidt, Garratt and Fitzpatrick (2001) identified 16 reported instruments. After an analysis of the suitability of these instruments in terms of age and content, the Instrument for Monitoring Adolescent Health Issues seemed to be the most appropriate measure to use for the current research programme. Published by Stanton, Willis and Balanda (2000), this instrument was designed to monitor health and health-related behaviours of Australian secondary school children, with an emphasis on identifying patterns of negative health outcomes. Development of the instrument included focus groups with the target age groups, consultation with relevant health professionals and a pilot study. Analysis of internal consistency found most of the questions had moderate to high test-re-test reliability ( $k > 0.5$ ).

For the current research programme, the measure was obtained through correspondence with the authors. The questionnaire has eight parts (A-H). Part A collects demographic details and part B consists of questions relating to exercise. Part C addresses injuries in the last 12 months, and part D consists of items concerning smoking, drinking and other drug taking. Part E involves questions regarding sun safety, and part F addresses questions regarding general health, including issues of bullying, depression, and suicide. Part G consists of questions

regarding sexual health, and finally, part H is concerned with diet and nutrition. For the current research programme only parts B, D, and H are of interest addressing exercise, smoking, drinking and nutrition respectively. Overall, the questions seem appropriate for use in countries other than Australia.

There are some issues that should be noted when using health-related assessment tools. First, there is a lack of the standardisation in the conceptualisation and measurement of health behaviours and health-related issues among the young (Levi & Drotar, 1998). This has been discussed previously in this chapter and it seems clear the concept of health has yet to be captured in a single definition. It can be argued that there will never be a single definition of health and that the appropriate concept applied will depend on the reason of the assessment. Secondly, there is the issue of cognitive development. As mentioned previously, children's concepts of health with reference to illness go through stages similar to those illustrated by Piaget. However, the age of which a child reaches these stages is debatable. Therefore, although instruments are developed to be appropriate for certain age groups, the cognitive development within these groups may vary. There may also be cultural differences (Landgraf & Abetz, 1996), such as those discussed earlier in the chapter (Flick, 2000).

### **3.2.5 Summary**

There is no universally accepted definition of health in the current literature. It seems health is a multifaceted concept which cannot be captured in a single definition. It is acknowledged, however, that it is a value (Downie & Macnaughton, 1998). Health could be described as having positive personal control over physical,

psychological and social resources; if this control is in some way compromised by external factors, such as disease or distress, health may then become impaired.

A child's understanding of health and the cause of illness progresses through developmental stages, with an understanding of generalised principles developing around the age of 11 years (Bibace & Walsh, 1980). Perceptions of what constitutes good health surround physical and social functioning and attractiveness (Mechanic & Hansell, 1987; Giskes et al, 2005), with health threats receiving little acknowledgement (Greening et al, 2005). This suggests that short-term factors are more salient to young people than long-term consequences.

A quantitative measurement of children's health perceptions and issues related to health behaviours has not been found. Research in the area of health perceptions tend to employ qualitative methods of analysis (Mahasneh, 2001; Flick, 2000; Millstein & Irwin, 1987). Furthermore, measures of children's health behaviour vary between studies, confounded by methodological issues, the nature of the study and the use of self-report data. A standardised measure is needed to enable the multi-dimensional concept of a health perception to be measured and evaluated across future research programmes with specific reference to individual health behaviours. This is one objective of the current research programme. To meet this objective it is important to first investigate the theoretical background of cognitive factors that may have an influence on healthy behaviour.

### **3.3 Theoretical Background**

*“Those responsible for health promotion should be able to describe the philosophical aspects of what they are trying to do...”*

*(Evans, Head & Speller, 1994).*

Research can be a link between theory and practice. Theories are an organised set of knowledge that helps to analyse, predict or explain a particular phenomenon (Naidoo & Wills, 2005). Linking research to practice allows health professionals to use the theories of their discipline to understand how it may help in their practice and how empirical evidence can inform a wider understanding of theoretical constructs. Within Public Health, and indeed any other scientific discipline, theory can help at different stages of policy and programme development, from the initial aims, objectives and the assessment of need, through to the design, implementation and evaluation.

Theoretical frameworks provide key assumptions about factors that need to be taken into account and how a piece of research or an intervention programme will achieve its desired outcomes. A theory may explain, factors influencing a phenomenon (e.g. why some parents do not immunize their child), the relationship between these factors (e.g. whether this decision is related to levels of knowledge and perceptions of risk; attitudes to interventions, beliefs about disease; levels of media attention; social norms and so on) and finally the conditions under which these relationships occur (e.g. do immunisation rates fall when there is media attention to their risk, or in particular social groups) (Naidoo & Wills, 2005). The first study in the current

research programme aims to understand factors that influence children's health behaviour decision making and is based on a number of theoretical constructs in health psychology. A better understanding of such factors could in turn influence the effectiveness of health promotion interventions, such as those under investigation in the second study of this thesis.

### **3.3.1 Social Cognition Models**

The most widely used and accepted theoretical constructs for health promotion and education are those evolved from Social Learning Theory (Bandura, 1986), known as social cognition models. The task of changing an individuals' unhealthy practices to more healthy alternatives is notoriously problematic and complex. To simply expect an individual to change their behaviour when presented with information or a threat of disease or illness is naïve. Social cognition models have greatly influenced the direction of preventive health behaviour and have provided a wider framework to base interventions on than mere education. Social cognition models are designed to examine the predictors of health-related behaviours (Ogden, 2000), and their strength lies in their ability to observe such factors.

The most common social cognition models used to examine various predictive factors of cognition on future health-related behaviours are: the Health Belief Model (HBM); Health Locus of Control (HLC); Self-Efficacy Theory (SET); and the Theory of Planned Behaviour (TPB).

### **3.3.1.1 Health Belief Model**

The Health Belief Model is one of the oldest and most widely used social cognition models. It was first proposed by Rosenstock (1966) and was further developed by Becker, Haefner and Maiman (1977). The model suggests that behaviour is a result of a set of core beliefs. These core beliefs are the individuals' perceptions of their susceptibility to illness, the severity of the illness, the costs involved in carrying out behaviour, and the benefits involved in carrying out behaviour. Within this model, these core beliefs are used to predict the likelihood that behaviour will occur. Therefore, an individual is likely to adopt a particular health action if they believe they are susceptible to a particular condition, which they also consider to be serious, and believe that the benefits of the action in question outweigh the costs (Abraham & Sheeran, 2005). There are two other variables commonly included in this model: cues to action and health motivation. Cues to action include a wide range of triggers to take up an action, and can be internal (for example, a physical symptom) or external (for example, a public health campaign). It has been argued by Becker (1974) that certain individuals may be predisposed to respond to such cues because of the value they place on their health (cited in Conner & Norman, 1995).

There is no clear identification of the way these variables work and interact to produce behaviour change, however, the model has had much success in predicting a range of health behaviours (Janz & Becker, 1984), and provides a useful framework for future models. Interactions have been found between components of the Health Belief Model and other social cognition theories in children, with low levels of susceptibility to illness reported to be related to an internal locus of control and a high value placed on health (Parcel, Nader & Rogers, 1980). The model has,

however, come under much criticism due to a number of weaknesses. Important factors such as intentions to perform behaviour, social factors and perceptions of control such as self-efficacy are not included in the model. There is also no distinction between a motivational stage, which is dominated by cognitive variables, and a volitional phase, where action is planned, performed and maintained (Schwarzer, 1992). Thus, the model is viewed as static (Conner & Norman, 1995).

### **3.3.1.2 Health Locus of Control**

The concept of 'locus of control' was introduced by Rotter (1954). Its origins lie in the social learning tradition which considered the expectations of the individual and how they relate to reinforcements. Rotter (1954) distinguished between those with an internal locus of control and those with an external locus of control. Individuals with an internal locus of control are more likely to believe that outcomes (reinforcements) are a consequence of their own efforts, whereas those with an external locus of control are more likely to believe their life is determined by factors beyond their control. Wallston, Wallston and DeVellis (1978) developed Rotter's theory and constructed a Multidimensional Health Locus of Control (MHLC) Scale. This scale measures a person's health expectancy beliefs along three dimensions, internal, powerful others and chance. The internal dimension measures the extent to which individuals believe their health is under the influence of their own actions, with statements such as, 'I am directly responsible for my health'. The powerful others dimension measures the extent to which individuals believe their health is determined by powerful others (i.e. health professionals), with statements such as, 'I can only do what my doctor tells me to do'. And finally, the chance dimension



measures the extent to which individuals believe their health is not controllable by them and is in fact in the hands of fate, with statements such as, 'Whether I am well or not is a matter of luck'. Research examining the predictive ability of the health locus of control construct has provided mixed results. Internal locus of control has been associated with an increased likelihood of health-enhancing behaviours, such as exercise (Norman, Bennett, Smith & Murphy, 1997; Steptoe & Wardle, 2001), although these findings are not consistent in the literature (Rabinowitz, Melamed, Weisburg, Tal & Ribak, 1992). Associations with health locus of control have also been inconsistent in research examining healthy eating (Bennett, Moore, Smith, Murphy & Smith, 1994) and alcohol consumption (Bennett, Norman, Murphy, Moore & Tudor-Smith, 1998).

The development of a child's locus of control beliefs have been reported to be linked to parenting styles. Joe (1971) revealed a link between internal locus of control beliefs and a supportive parenting style (based on warmth, approval, flexibility, consistency, and encouraging independence). External locus of control beliefs were linked to a controlling parenting style (based on rejection, punishment, domination and criticism). Lefcourt (1982) supported this with evidence that internal beliefs develop from an environment in which children receive warmth and attention, while gaining fair critical appraisal on their performances. This is thought to encourage personal responsibility of life events from an early age. Associations between external beliefs and low social economic status (creating a sense of helplessness) were also revealed. Lefcourt (1982) further suggested that the influence of peer pressure and conformity are positively related to external locus of control beliefs due to the submission of responsibility.

Internal locus of control has been associated with greater knowledge of disease (Wallston, Maides & Wallston, 1976). Individuals who possess internal beliefs over their health outcomes have been reported to process information more efficiently with a more inquisitive and curious style (Lefcourt, 1982). Internal locus of control beliefs in children are also found to be related to greater knowledge of health issues (Tinsley, 1992). As discussed earlier, the development of health and illness concepts through childhood imply a transition of conceptions of the nature of health and illness. This transition is thought to lead to the acquisition of a belief that health status may be predictable and controllable through individual behaviour. The maturity of such beliefs is thought to be directly related to the concept of locus of control (Eiser, Eiser, Gammage & Morgan, 1989).

Lau (1982) provides further evidence of differing health-related behaviours in relation to health locus of control beliefs. In a survey of 257 undergraduate students, Lau (1982) presents evidence that retrospective reports of health and illness are related to current locus of control beliefs. Early health habits, such as teeth cleaning and experience with medical professionals were positively related to beliefs in self-control over health (internal locus of control). In contrast, external locus of control beliefs and 'chance health outcomes' have been found to be positively related to early and repeated experience of illness and injury (Tolar, 1978) and experience of family illness (Lau, 1982). Eiser et al, (1989) offer support for the notion that health locus of control beliefs develop alongside other health beliefs and behaviours throughout childhood. Evidence from a survey of 10,579 children aged between 11-16 years old suggested that those who exhibited a higher internal 'personal' control belief, regarded 'positive' health habits (such as 'eating good foods' and 'getting

plenty of exercise’) as more beneficial than those who held a belief in ‘chance’. In this study, chance beliefs were found to be negatively related to beliefs in the benefits of eating good food and exercising, and positively related to the use of avoidance behaviours (Eiser et al, 1989).

In addition to predicting behaviour change, health locus of control can be important when considering the kind of communication style an individual requires from a health professional. For example, if a health professional encourages an individual who has an external locus of control to change their lifestyle, the individual is unlikely to comply if they do not believe they are responsible for their health. In the context of health behaviours, it is hypothesised that those who have an internal locus of control are more likely to engage in protective health behaviours. However, research findings in this area are mixed, with some reporting a positive relationship (Weiss & Larsen, 1990), and others showing a non-significant relationship (Wurtele, Britcher & Saslawsky, 1985). Many researchers have expressed the view that failure to include the role of health value may deem the HLC concept inadequate (Wallston, 1992). It is argued that HLC beliefs should only predict health behaviour when individuals value their own health (Conner & Norman, 1995). In support of this, positive results have been produced from studies looking at the interaction between internal HLC and health value (Weiss & Larsen, 1990).

The concept of health locus of control is another theory to have come under criticism. The first is the question of whether HLC is a state or a trait. Is an internal locus of control stable over time? Or could it change over time, or with respect to different behaviours. Perhaps it is possible to have both high external and high

internal health locus of control beliefs at the same time. Furthermore, internal control beliefs may not be a positive characteristic in uncontrollable situations. In a life-threatening, uncontrollable situation for example, it could be argued that an individual with an external locus of control would possess the more desirable belief (i.e. 'fate will decide if I live or die'). Whereas, those with internal beliefs may become more anxious due to their perceived lack of control over the potential outcome of the situation. Beliefs in fate may also provide comfort for those who are terminally ill and beyond medical intervention. Furthermore, there is uncertainty as to whether certain actions should be considered as external or internal. For example, is going to the doctor for help drawing on external health locus of control beliefs (the doctor is a powerful other who can make me well), or internal health locus of control beliefs (I am determining my health status by searching out appropriate intervention) (Ogden, 2000). These uncertainties are a substantial downfall of the concept.

In an attempt to redeem the construct of health locus of control, Wallston (1992) developed a 'Modified Social Learning Theory' (MSLT), which suggests that HLC beliefs are necessary but not sufficient to perform health behaviour. It is argued that health value and self-efficacy beliefs must also be present. Therefore, to perform a health behaviour an individual must value their health, believe that it is owing to their own health-related actions and concurrently believe that they are capable of performing the health behaviour in question (Wallston, 1992). The author has found little evidence in support of the MSLT and it is thought to have seen little application in the health behaviour field (Conner & Norman, 2005). There are, however, studies that have examined the concepts of health locus of control and health value which report that individuals who place a high value on their health and have high internal

health locus of control beliefs, are more likely to adopt, or have positive attitudes towards preventative behaviours (Nemcek, 1990). Studies which have examined the interaction between internal HLC and health value have generally produced positive results (Shelton Smith & Wallston, 1992; Weiss & Larsen, 1990), although some studies have found no interaction (Wurtele et al, 1985). It is also interesting to note the evidence of gender differences when reporting health value that has found that women place greater value on their health and exhibit a higher level of health-protective behaviour than their male counterparts (Felton, Parsons & Bartoces, 1997).

In sum, the health locus of control construct is a fairly weak predictor of health behaviour, even with the addition of health value with research in the area producing mixed results. Interesting findings have, however, been generated in research involving children using the construct (Eiser et al, 1989) although such research is now dated and may therefore be worthy of further investigation to examine its ability to predict young people's health behaviour decisions.

### **3.3.1.3 Self-Efficacy Theory**

Self-Efficacy Theory (Bandura, 1977) is predominantly a theory of human motivation. Perceived self-efficacy is defined as the beliefs people hold about their capabilities to produce designated levels of performance which influence events that affect their lives (Bandura, 1994). Self-efficacy beliefs influence how people think, feel, motivate themselves and act. The concept, first introduced by Bandura (1977), assumes that human motivation and action are facilitated by a personal sense of control. Self-efficacy expectancies are believed to have a direct impact upon

behaviour and an indirect effect by influencing behavioural intentions. This first belief is derived from the fact that optimistic self-beliefs predict actual behavioural performance (Bandura, 1992; Schwarzer, 1992). The second reflects the fact that individuals typically intend to perform behaviours they perceive to be within their control (Bandura, 1992; Schwarzer, 1992). If an individual believes that they can take action to solve a problem instrumentally, they become more inclined to do so, and feel more committed to this decision. Furthermore, people with high self-efficacy beliefs pursue more challenging and ambitious goals (Luszczynska, Scholz & Schwarzer, 2005). A strong sense of personal efficacy has been found to be related to better health, higher achievement and more social interaction (Schwarzer & Fuchs, 1995).

In his text on social learning theory, Bandura (1977) challenges personality trait and psychodynamically oriented theories that address human behaviour in terms of internally driven motivations. He also rejects deterministic theories of behaviour that view people as being entirely at the mercy of environmental conditions. Instead, he channels his beliefs toward equal determinism, stating that: *“Social learning theory approaches the explanation of human behaviour in terms of a continuous reciprocal interaction between cognitive, behavioural and environmental determinants”* (Bandura, 1977). *“People may be considered partially free insofar as they can influence future conditions by managing their own behaviour”* (Bandura, 1977). Therefore, it was assumed that people actively seek to shape environmental conditions to suit their own purposes. It is thought that some people are better at this than others because they have acquired skills that enable them to do so (Walker, 2001). It is from this theory that the concept of self-efficacy was derived.

Self-Efficacy Theory (SET) assumes that human motivation and action are based on three types of expectancies: situation-outcome, action-outcome and perceived self-efficacy. Situation-outcome expectancies are beliefs about what outcomes will occur without personal action. An example of situation-outcome expectancy is one's susceptibility to a health threat. This type of belief can make people feel more or less vulnerable towards anticipated events. Some individuals hold distorted beliefs in terms of their vulnerability to certain health threats and are unrealistically optimistic regarding their health (Weinstein, 1982). This is particularly true for children (Greening et al, 2005; Gochman, 1987). Action-outcome expectancies represent the beliefs that outcomes occur as a result of personal action. An example of action-outcome expectancy is the belief that quitting smoking will lead to a reduced risk of lung cancer. Finally, perceived self-efficacy represents the belief a person has in their capability to perform a specific action required to attain a desired outcome. Therefore, while situation-outcome expectancies represent the belief that things happen in the world without personal action, action-outcome expectancies and self-efficacy expectancies allow the option to change the world and to actively cope with health threats by taking preventive action (Schwarzer, 1992).

There is a clear causal ordering among these three types of expectancies (Schwarzer, 1992). It is assumed that situation-outcome expectancies influence behaviour by the impact they have on action-outcome expectancies. For example, risk perceptions from a health threat a person believes they may be susceptible to, is thought to motivate them to consider relevant action that may reduce this risk. Action-outcome expectancies are thought to be precursors of self-efficacy as individuals

predominantly make assumptions about the consequences of behaviours before contemplating their ability to take action. Self-efficacy expectancies are thought to be the most significant of the three beliefs, having a direct impact on behaviour, and an indirect impact in the ability to influence intention. In sum, the likelihood that an individual will adopt a health-enhancing behaviour or refrain from a health-impairing behaviour is thought to be based on three sets of cognitions. First, the expectancy that one is at risk. Second, the expectancy that behavioural change would reduce the threat and finally the expectancy that one is capable of adopting or refraining from the behaviour in question (Schwarzer & Fuchs, 1995).

As discussed previously, low levels of perceived vulnerability in childhood, a lack of negative health experience (Greening et al, 2005; Gochman, 1987) and health risk perceptions are often insignificant predictors of the intention towards behaviour such as healthy eating (Schwarzer & Renner, 2000; Schwarzer & Fuchs, 1995). It, therefore, seems that action-outcome expectancies and self-efficacy beliefs would be the most significant cognitions to focus on in the current research programme. Outcome expectancies can also be framed in a positive way, emphasizing health promotion rather than risk prevention.

Examining the influence of risk perception, positive outcome expectancy, negative outcome expectancy, self-efficacy and past behaviour, Schwarzer and Fuchs (1995) established, through hierarchical regression analysis, that these health-related cognitions and prior behaviour explained 29 percent of the variance in men's and 28 percent of the variance in women's intentions to eat healthy foods. Positive outcome expectancies, self-efficacy beliefs and past behaviour were the only significant



predictors in the model. Investigating smoking behaviours in a sample of 85 adolescents (aged 14-17 years) De Vries (1989) found that self-efficacy beliefs explained 15 percent of the variance in intentions to avoid smoking cigarettes when added after attitude and social norms. These findings have found empirical support elsewhere, with perceived self-efficacy frequently reported as a strong predictor for health behaviours and behavioural intentions towards exercise (Luszczynska et al, 2005; Weiss, Wiese & Klint, 1989; Dzewaltowski, Noble & Shaw, 1990), eating behaviours (Shannon, Bagby, Wang & Trenkner, 1990), and the avoidance of smoking cigarettes (Kok, Den Boer, De Vries, Gerards, Hospers & Mudde, 1992). This evidence suggests self-efficacy and outcome expectancy beliefs are strong predictors of both behavioural intentions and health behaviours.

#### **3.3.1.4 Theory of Planned Behaviour**

The Theory of Planned Behaviour (TPB: Ajzen, 1985) is an extension of a widely used and applied theory in social psychology, the theory of reasoned action (TRA: Fishbein & Ajzen, 1975). The Theory of Reasoned Action examines the individual within their social context and emphasises the importance of social cognitions in the form of subjective norms (beliefs about the attitudes of important others towards a behaviour and motivation to comply) and attitudes (beliefs and evaluations of outcomes). The Theory of Planned Behaviour expanded the Theory of Reasoned Action by incorporating the measure of perceived behavioural control. The determinant of behaviour within these models is said to be an intention to engage in the behaviour. Intentions represent a conscious decision, reflecting a person's motivation to exert effort into the performance of behaviour. The link between intention and behaviour reflects the hypothesis that people engage in behaviours they

intend to perform (Conner & Sparks, 2005). However, the assumed link between intention and behaviour is an assumption that has become a focal challenge for current research (Sniehotta, Scholz & Schwarzer, 2005). This link will be addressed in more detail in Chapters 5 and 6 with specific reference to the second study in the current research programme.

The TPB can, therefore, be broken down into a model with three determinants of behavioural intentions, where behaviour is predicted by intentions, which are in turn predicted by attitudes, subjective norms and perceived behavioural control. Attitudes are the overall evaluations of the behaviour by the individual (Conner & Sparks, 1995). Early work involving the Theory of Reasoned Action defined an attitude as *'a learned disposition to respond in a consistency favorable or unfavorable manner with respect to a given object'* (Fishbein & Ajzen, 1975). The attitude component in this model is itself made up of a further set of perceptions; the likelihood of an outcome occurring as a result of performing a behaviour (behavioural belief) and the evaluation of that outcome (outcome evaluation). Subjective norm is a function of normative beliefs encapsulating the perception of how significant others (i.e. parents, friends) would view the behaviour, and how motivated the person is to comply with these significant others. Perceived behavioural control is the overall belief that the individual can access the resources and opportunities necessary to successfully perform the behaviour. These factors are both internal (knowledge, skills, emotions) and external (opportunities, dependence on others, barriers). The TPB states any particular behaviour is comprised by (a) an action (or behaviour), (b) performed on or towards a target, (c) in a context, (d) at a time or occasion. An example of this has been provided by Conner and Norman (1995) in relation to oral hygiene. In this

instance a person (a) brushes, (b) their teeth, (c) in the bathroom, (d) every morning after breakfast. A combination of these elements is acceptable for the model, with the statement of an action and time-frame constituting the minimum elements.

The TPB has been applied to a range of health behaviours including healthy eating, physical activity, smoking tobacco and alcohol consumption. When applying the TPB to physical activity, reporting on a meta-analysis of 72 studies using the theory for both adults and young people, Hagger, Chatzisarantis and Biddle (2002) found that the strongest influences on intentions were perceived behavioural control, self-efficacy and past behaviour. Subjective norm was found to be a small, but significant predictor. Attitude, subjective norm and perceived behavioural control explained 45 percent of the variance in intentions. Analysed separately, attitude and perceived behavioural control were found to be stronger predictors than subjective norm. These findings support earlier reports that intentions to exercise are based on attitudes and perceived behavioural control, with no influence from subjective norms (Dzewaltowski, Noble & Shaw, 1990). In contrast, in a meta-analysis of 19 prospective studies using the TPB to examine healthy eating behaviours, McEachan, Conner and Lawton (2005) report that attitude, subjective norm and perceived behavioral control contribute to 41 percent of the variance in behavioural intention. Attitude was revealed as the strongest predictor of behavioural intention, followed by subjective norm, with perceived behavioural control uncovered as the weakest predictor. Reviewing the application of the TPB to drug use, McEachan et al. (2005) located 7 studies examining tobacco smoking and 3 investigating alcohol use. These studies, and a further 8 exploring illicit drug use were reported in a meta-analysis. Across these studies, attitude, subjective norm and perceived behavioural control

explained 53 percent of the variance in behavioural intentions. The strongest predictor was perceived behavioural control, followed by attitude, and again subjective norm was the weakest predictor.

In summary the TPB has demonstrated successful results when investigating predictive factors of behavioural intention. There is, however, a common indication in the literature that suggests subjective norms are the weakest element of the model. Explanations for this include a reflection of the lesser importance of normative beliefs as determinants of intentions and methodological differences across studies, such as the use of single versus multiple item measures (Conner & Norman, 1995). Attitudes and perceived behavioural control have repeatedly been reported as the most significant components of the Theory of Planned Behaviour and are, therefore, cognitive constructs worthy of further investigation.

### **3.3.2 Perceived Image**

A further concept that may provide theoretical insight into children's perceptions of health and health behaviours is that of perceived image. Among adolescents, the theoretical construct of perceived image has been a particularly successful approach to the study of smoking onset. Such research has focused on the image young people have of health behaviour and of the type of person who engages in such behaviour. Research has suggested that the self-concepts of adolescents who were currently smoking matched closely to the stereotypic image generally associated with smokers (Chassin, Presson, Sherman, Corty & Olshavsky, 1981). Among non-smokers, those who had self-concepts that matched the smoker image were more likely to report they intended to smoke cigarettes in the future (in a month and in a year). In

contrast, the intention not to smoke has been found to be associated with a negative smoker image (Barton, Chassin, Presson & Sherman, 1982). Similar results have also been obtained among adolescent boys with alcohol images (Chassin, Tetzloff & Hershey, 1985). The reasoning put forth in many of these studies suggests that young people's decisions to engage in 'adult like' behaviours, such as smoking and drinking, are a reflection of their attempts to acquire the image that they associate with the behaviour (Leventhal & Cleary, 1980), or with groups of individuals who engage in the behaviour (Gibbons & Gerrard, 1995). In an extension to these assumptions Riley, Matarazzo and Baum (1987) suggest poor health behaviours develop as a response to social anxiety. Such social anxiety in adolescence is thought to disperse by engaging in behaviours such as smoking, which are thought to communicate a 'cool' image.

Perceived image, or prototype, is thought to be reactive (Gibbons & Gerrard, 1995). Therefore, as an individual becomes more serious about either engaging or avoiding a health-related behaviour, his or her perception of the prototype is altered in a favourable or an unfavourable way. It is also believed that the nature of the image associated with a particular behaviour may be an indication of impending behaviour change (Gibbons & Gerrard, 1995). For example, a non-drinking adolescent who has a relatively favourable image of the typical young drinker, and who engages in a social comparison with that image, is more likely to engage in or increase his or her drinking behaviour compared to an adolescent who has a less favourable image (Gibbons & Gerrard, 1995). This may prove to be an important avenue for research towards preventive health behaviour and intervention design.

### **3.3.3 Theoretical Framework of Study 1**

Study 1 of the current research programme will draw on aspects of social cognition theories, such as Self-Efficacy Theory (Bandura, 1977b; Schwarzer, 1992), the Health Locus of Control Construct (Rotter, 1966; Wallston, Wallston & DeVellis, 1978) and aspects of the Theory of Planned Behaviour (Ajzen, 1985). It will also investigate two further constructs deemed important for health promotion namely Health Value (Lau, Hartman & Ware, 1986) and perceived image (Chassin et al, 1981).

In relation to health behaviours specifically, Self-Efficacy Theory states that the greater the degree of control a person believes that they have over their actions and the more positively they view the outcome of their actions to be, coupled with the ability to cope when things do not always go their way, the more likely it is that person will pursue healthy behaviours (Schwarzer, 1992). The Health Locus of Control construct works on a similar basis. However, this construct measures how much control a person believes they have over their health outcomes. Individuals are thought to differ in locus of control, suggesting some believe their health is related to their own actions while others believe it is a result of powerful others such as doctors, fate or God (Rotter, 1966). Individuals with an internal locus of control are thought to be more likely to engage in health-enhancing behaviours such as exercise (Norman et al, 1997; Steptoe & Wardle, 2001). The notion of health value states that the higher the value given to health, the more likely that person will engage in healthy behaviours (Lau et al, 1986). Wallston (1992) combined these theories to develop the 'Modified Social Learning Theory'. According to this theory in order to engage in a health promoting behaviour, individuals must value their health, believe

that their health is a result of their own health-related actions and concurrently believe that they are capable of performing the behaviour in question. The theoretical framework of the Modified Social Learning Theory therefore postulates that the presence of an internal health locus of control, high self-efficacy beliefs and a high health value are all salient for the formation of a health behaviour intention. Although proposed in 1992, empirical evidence in support of the theory has not been found. The current research programme aims to investigate the ability of the model's components to predict health behaviour intentions, while adding a further component of perceived image to create a proposed Modified Social Learning Theory for Children (MSLTc). Thus, in addition to possessing beliefs in the controllability of health outcomes and health actions, and a high value placed on health, the perceived image children have of themselves may also be important. Therefore, the addition of the component of image seems justifiable for a younger generation.

In an attempt to conceptualise and measure health behaviour perception, the current research programme aims to extend the existing construct of health value into a behaviour-specific measurement of perceived behavioural importance. This cognitive component has not been found to be empirically investigated. A further construct to be included in the measurement of a health behaviour perception is that of attitude. Derived from the Theory of Planned Behaviour (Ajzen, 1985), attitude has been reported to be a strong predictor of health behaviour intention. The remaining factors from the model, subjective norm and perceived behavioural control, will not be included in the current research programme. Therefore, the overall theoretical construct of the TPB will not be tested. The exclusion of these cognitive factors is based on the findings from the literature discussed previously.

Subjective norms have repeatedly been found to be weak predictors of health behaviour intention, suggesting they have a lesser importance to attitude beliefs. It is the aim of the current research programme to identify significant cognitions that predict health behaviour intentions. Thus, to include a factor that is empirically reported to have weak predictive abilities would be counter-productive. In contrast, perceived behavioural control has generally been found to be a strong predictor of health behaviour intention. However, the construct has strong similarities to that of self-efficacy, referred to recently by Ajzen (2002) as being 'quite similar'. These similarities are so evident that Schwarzer (1992) has argued that perceived behavioural control should simply be relabeled as self-efficacy. In agreement with this view, several researchers have replaced measures of perceived behavioural control with measures of self-efficacy within the TPB (Conner & Sparks, 2005). Due to this overlap and the positive results of self-efficacy as a determinant of health behaviour intention within the literature, only self-efficacy and not perceived behavioural control will be included in the current research programme. This combination of cognitive constructs that are thought to reflect a health behaviour perception shall be referred to as the Modified Theory of Planned Behaviour (MTPB). The MTPB makes the assumption that the perceived image of a typical person performing a health behaviour, the perceived importance of the health behaviour on health status, self-efficacy beliefs specific to the health behaviour, and the attitudes, outcome expectancies and outcome evaluations of the performance of the health behaviour all contribute to the prediction of an intention to perform a health behaviour.



Research investigating children's health behaviours incorporating the theories of self-efficacy, health locus of control, health value and the Theory of Planned Behaviour are limited and dated to the extent that they do not reflect the present day realities that children and young people face. Evidence in support of the Modified Social Learning Theory and perceived behavioural importance have also not been found. Therefore, it is the aim of the current research programme to bring these theories together in an investigation of the possible effects these psychological characteristics may have on children's health behaviour intentions. Research oriented toward the identification of common theoretical and methodological themes in health behaviour research has been welcomed (Nigg, Allegrante & Ory, 2002). Such an investigation will provide an original contribution to the field of Health Psychology building on valid constructs developed for the adult population. It is hoped this study will pave way for an empirically driven integration of the most significant cognitive components that predict children's health behaviour intentions. Considerations may then arise for further theory development designed specifically for young people, providing a more complete theoretical construct to those mentioned in the current chapter.

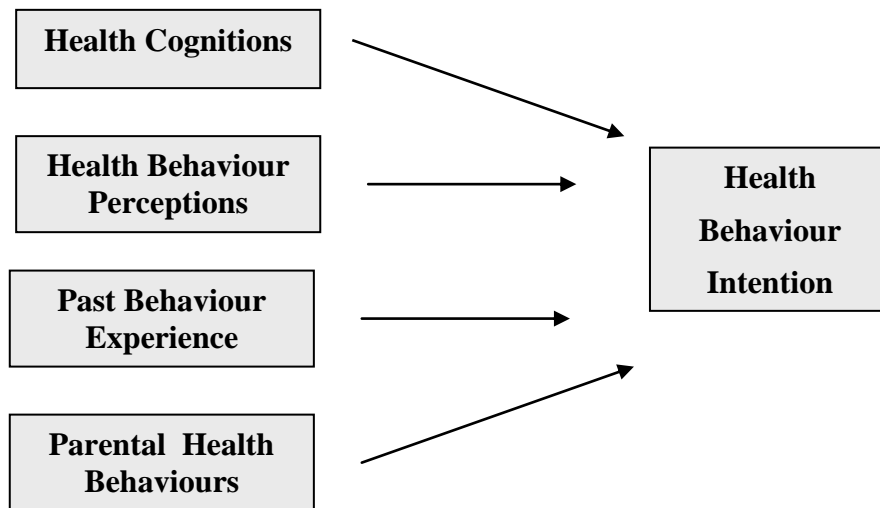
## **Chapter 4: Study 1 - Children's Health Perceptions and Health**

### **Behaviours**

#### **4.1 Aims and Objectives**

The first study in the current research programme examined children's individual cognitions, how children perceive healthy eating, regular physical activity, avoiding smoking cigarettes and avoiding drinking alcohol, their past behaviour performance and their perceptions of their parents' health behaviours. The overall aim was to investigate the extent to which these cognitions, health behaviour perceptions and past behaviour experiences predict the child's future intentions towards these behaviours.

The objective of the first study was to investigate why some children choose to perform healthy behaviours, while others take-up those known to be detrimental to health. There is a vast amount of research evaluating the health behaviours children and adolescents perform. However, research focusing on children's *perceptions* of such behaviours and their impact on health is limited. Children's perceptions of health tend to be researched in those who are chronically ill or hospitalised (Eiser & Kopel, 1997). A salient aspect of health promotion planning is the analysis of significant determinants of health behaviours (Kok et al, 1992). Gaining an understanding of how children think, and what factors may influence this, would give health promotion campaigns a much stronger basis in terms of helping young people to make healthy choices and to maintain this behaviour. An overview of this first study can be seen in Figure 1.



**Figure 1: Overview of study 1 in the current research programme.**

#### **4.2 Literature Review**

Mortality and morbidity are affected by a combination of health behaviours (Belloc, 1973; Breslow & Enstrom, 1980). Coronary heart disease, cancer and stroke are accountable for two thirds of all deaths within the UK today (DoH, 2004) and are collectively costing the NHS an estimated £3.8 billion every year (DoH, 1998). Many of these deaths are preventable through a good diet, regular physical activity, avoiding smoking cigarettes, and drinking alcohol in moderation. The observed link between the protective effects of health-enhancing behaviours such as healthy eating (Kumanyika et al, 2000; WHO, 1990) and physical activity (Hu et al, 2005; Hardman, 2001; DoH, 2004), coupled with the increased health risk of health-impairing behaviours such as smoking (DoH, 2004; DoH, 1998) and alcohol misuse (WHO, 2001; DoH, 2004c; Murray & Lopez, 1997) on the mortality and morbidity of the leading causes of death such as coronary heart disease and cancer are salient to health promotion research.

Patterns of behaviour are often set early in life and influence health throughout the life-span with reports that childhood health status such as obesity is a strong predictor of similar problems in later life (Whitaker et al, 1997). Initial health habits tend to develop during childhood and adolescence (Telama et al, 2005; DoH, 2004; Curtis, 1992). From the perspective of the young person, behaviours such as smoking, drinking, poor nutrition, and lack of exercise, appear to have little or no apparent effect on health and physical functioning (Taylor, 1995). It is the cumulative effect of these behaviours that may cause problems in later life. This gap between behaviour and the long-term consequences for health can act as a barrier for health promotion strategies.

#### **4.2.1 Age and Gender Differences in Health Behaviours**

Health behaviours of interest in the current research programme differ significantly by age and gender. Empirical evidence suggests that healthy eating behaviours are more frequent in girls compared to boys (Glynn et al, 2005; Todd et al, 2000; Misra & Aguillion, 2001). In contrast, physical activity is more frequent in boys than girls (Todd et al, 2000; Misra & Aguillion, 2001) and among younger children than older children (Misra & Aguillion, 2001). Smoking is reported to be more prevalent in girls than boys (Nahit et al, 2003), and significantly increases with age (Galanti et al, 2001; Kurtz & Thornes, 2000). Finally, the consumption of alcohol is dramatically influenced by age with older children drinking a significantly larger amount of alcohol than younger children (DoH, 2004c). Alcohol consumption is also influenced by gender, with boys consistently drinking more alcohol than girls (DoH, 2004c, Kurtz & Thornes, 2000). While there is a wealth of epidemiological data

examining the health behaviours of children, little is known about psychological factors that may influence health behaviour decisions (Lohaus et al, 2004).

#### **4.2.2 Influential Factors on Children's Health Behaviour**

Children's motivations for certain health behaviours are highly complex (Macfarlane, 1993). Studies with children report they are aware of the health protective effects of health-enhancing behaviours such as healthy eating (Turner et al, 1997; Dixey et al, 2001) and show an appreciation for the negative effects of health-impairing behaviours such as smoking cigarettes (Macfarlane et al, 1987). Nevertheless, this knowledge is often not transformed into action (Sherratt, 1996; Johnson & Hackett, 1997; Macfarlane et al, 1987). There appears to be a disparity between children's health knowledge and health practices.

Health cognitions have been found to be significant predictors of health behaviours in adult populations (Hagger et al, 2002; Dzewaltowski et al, 1990; Schwarzer & Fuchs, 1995). Those who believe they have control over their actions (high self-efficacy), that their actions influence health outcomes (internal locus of control) and who value their health, are more likely to perform health-promoting activities (Luszczynska et al, 2005; Schwarzer & Fuchs, 1995; Wallston, 1992; Weiss & Larsen, 1990). Health beliefs that are important to the development of healthy practices are thought to develop in childhood around the age of 11 or 12 years (Maddux et al, 1986). Children's beliefs about the benefits of health-enhancing behaviours (such as healthy eating and physical activity) are reported to be related to high internal control beliefs (Eiser et al, 1989). Children's intentions to avoid health-impairing behaviours (such as smoking and drinking alcohol) are found to be

significantly explained by high self-efficacy beliefs (De Vries, 1989) and a negatively perceived image (Barton et al, 1982; Gibbons & Gerrard, 1995). Children often hold a distorted view of potential health risk, which is reported to be in part attributed to a lack of experience with negative health events and a low level of the perceived threat of certain health behaviours (Greening et al, 2005).

Health beliefs have been shown to be strongly affected by early socialisation, with the home being one of the most influential learning environments for children, and parents and other caregivers powerful models (Lau et al, 1990; Duffy, 1988). Research investigating parental influence on children's health behaviours has provided mixed results (Li et al, 2002; De Vries et al, 2003; Avenevoli & Merikangas, 2003). Findings from Avenevoli and Merikangas (2003) suggest that the influence of parental behaviour diminishes when other factors are taken into account. While research exists that seeks to document the links between parental health behaviour and the health behaviour of their child, there is no known research that investigates the relationship between parental health behaviours and the child's intentions towards them. This is one relationship the current research programme explicitly seeks to address. For the current research programme the child's observation of their parents health behaviours will be measured. Although the reliance on self-report measures is a possible limitation when collecting such data, it could be argued that perceived parental behaviour is more significant than a measure of the parent's 'actual' health behaviours. There may be health behaviours that parents engage in of which the child is unaware, such as exercise or alcohol consumed when the child is not present. This lack of exposure may lead to a difference between parental behaviour and the child's observations of how the parent

behaves. Although an investigation into this assumption would be of great interest, it is not within the scope of the current research programme and will, therefore, not be addressed here.

#### **4.2.3 Summary**

Considering the points raised previously, that health behaviours are strongly influenced by psychological cognitions and early socialization, it seems important to investigate the possible influence these concepts have on children's health behaviour intentions. That is, does a child's cognitions in relation to health, health behaviours and behavioural experience, influence the health behaviours they intend to perform in the future?

As discussed in Chapter 3, research investigating children's health behaviours incorporating the theories of self-efficacy, health locus of control and health value are limited and dated to the extent that they do not reflect the present day realities that children and young people face. Evidence in support of the Modified Social Learning Theory that incorporates these cognitions has not been found and is thought to have seen little application in the health behaviour field (Conner & Norman, 2005). The current research programme aims to investigate the ability of the cognitive components in the model to predict health behaviour intentions adding a further component of perceived image to the now proposed Modified Social Learning Theory for Children (MSLTc). This component is added with the assumption that for a younger generation, in addition to possessing beliefs in the controllability of health outcomes and health actions, and a high value placed on health, the perceived image they have of themselves may also be important.

There is no universally accepted definition of health in the current literature. A child's understanding of health and cause of illness progresses through developmental stages, with an understanding of generalised principles developing around the age of 11 years (Bibace & Walsh, 1980). To the authors knowledge, a quantitative measurement of children's health perceptions and issues related to health behaviours does not exist. Studies in the area of health perceptions tend to employ qualitative methods of analysis (Mahasneh, 2001; Flick, 2000; Millstein & Irwin, 1987). Measures of children's health behaviour vary between studies, confounded by methodological issues, the nature of the study and the use of self-reports. One objective of the current research programme is to create a standardised measure to enable the multi-dimensional concept of health perception, to be measured and evaluated with specific reference to individual health behaviours

As mentioned earlier, studies on children's health behaviours tend to focus on health behaviours children are performing while largely ignoring health behaviour perceptions. However, in view of the importance of health behaviour perceptions for intentions and actual behaviour in adult populations, it would seem important to establish whether this association can be replicated for children. If relevant cognitions can be identified for children there is a possibility of identifying those who may be at risk of performing unhealthy behaviours in the future. Previous behaviour will be taken into account in the current research programme, as it has been argued that the importance of past behaviour is in its ability to influence social cognitive factors (i.e. perceptions) that in turn determine behaviour (Bandura, 1986). However, the focus of the research will be on the child's *perception* of health behaviour. The measurement of a child's 'health behaviour perception' will combine



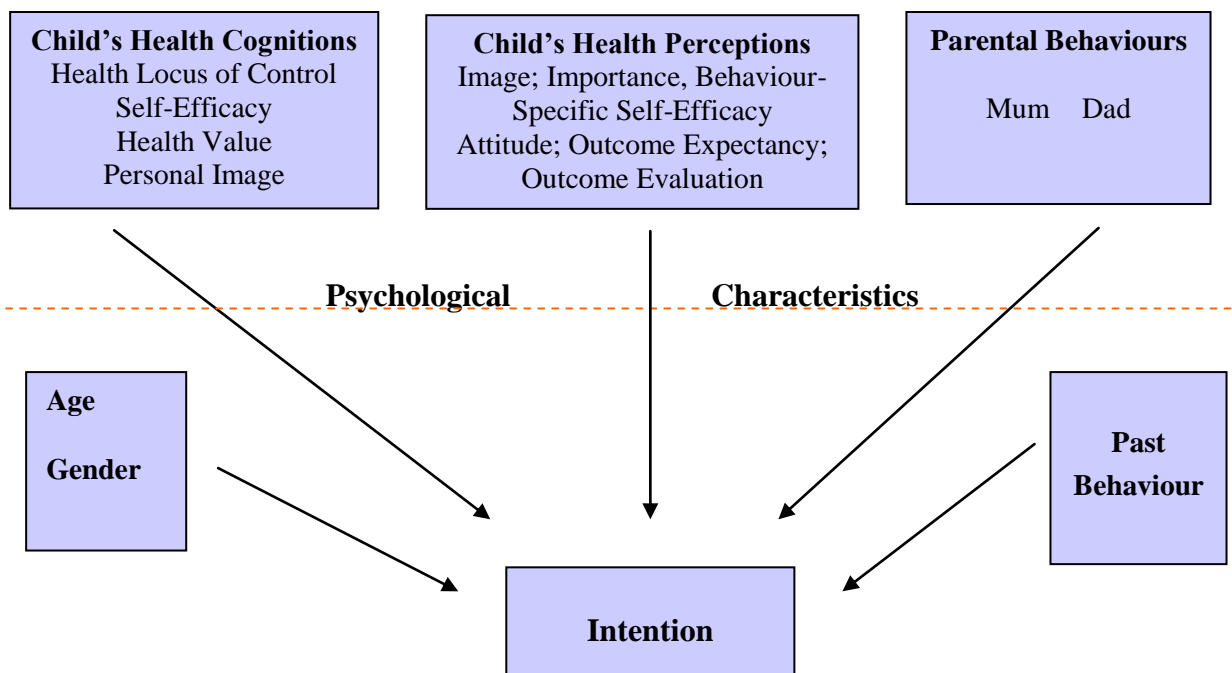
a number of multi-dimensional components namely, a perceived image component, a behavioural importance component, a behaviour-specific self-efficacy component, an attitude component, an outcome expectancy component and an outcome evaluation component. The combination of these cognitive constructs which have all been found to be strong predictors of health behaviour intentions shall be termed the Modified Theory of Planned Behaviour (MTPB).

The first component in the proposed Modified Theory of Planned Behaviour is perceived image. Research addressing the concept of image has found that it can be a significant predictor of health-related behaviours (Gibbons & Gerrard, 1995; Barton et al, 1982). The second component in the newly proposed theory is 'behavioural importance'. The concept of importance appears not to have been accounted for in any of the cognition models within health psychology other than health value. Valuing ones health provides an indication of the importance of health status for that person (Lau et al, 1986); however, this value is general and not behaviour-specific. The current research programme will attempt to bring the concept of 'behavioural importance' to the arena of health psychology models and identify if this cognitive construct has any predictive significance on behavioural intention. Thirdly, in addition to measuring children's generalised self-efficacy beliefs in the Modified Social Learning Theory for Children, it also seems appropriate to measure self-efficacy beliefs towards each of the target health behaviours in the Modified Theory of Planned Behaviour. While perceived self-efficacy is thought important in Wallston's (1992) 'Modified Social Learning Theory', it is also one of the most powerful predictors of health behaviour (Luszczynska et al, 2005; Schwarzer & Fuchs, 1995). Self-efficacy expectancies are

believed to impact directly upon behaviour and indirectly as a result of their influence upon intentions. This is derived from the fact that optimistic self-beliefs predict actual behaviour and that individuals typically intend to perform behaviours they perceive to be within their control (Luszczynska et al, 2005; Bandura, 1992; Schwarzer, 1992). The fourth component relating to attitude will measure the child's personal evaluations of the target health behaviour. Attitudes have been reported as being significant predictors of behavioural intention (Dzewaltowski et al, 1990; McEachan et al, 2005). The final two components of a health behaviour perception are an extension of the attitude construct and self-efficacy theory, measuring outcome expectancy and outcome evaluation. The expectancy of behavioural outcome appears in several guises in previous research. It appears in the Theory of Planned Behaviour as a factor of attitude under the name of behavioural beliefs, and is described as action-outcome expectancies in Self-Efficacy Theory. Irrespective of which guise they are measured, they have been repeatedly found to be significant predictors of (or part of a component such as attitude that can significantly predict) behavioural intention (McEachan et al, 2005; Luszczynska et al, 2005; Schwarzer & Fuchs, 1995; Floyd, Prentice-Dunn & Rogers, 2000; Milne, Sheeran & Orbell, 2000).

As the various dimensions comprising a health behaviour perception are thought to be 'states' of the mind as opposed to fixed 'traits', they are thus believed to be modifiable through the life-time. In order to test whether the various components which contribute to a health behaviour perception have any predictive abilities on children's intentions to perform health behaviours, the intention towards each of the target health behaviours will also be measured. These intentions will be measured by asking to what extent the child intends to; 'eat healthy foods', 'exercise for 30

minutes everyday’, ‘avoid smoking a cigarette’, and ‘avoid drinking alcohol’. Due to the age of the participants and the limited time-frame for data collection, intentions will be measured over a one week period and data on actual behaviour performance will be collected one week later for analysis in study 2 (which will be discussed in the following chapter). This time-frame has been used previously for such investigations providing evidence that intention and past behaviour are significant predictors of exercise behaviour at one-week follow-up (Norman et al, 2005). The components of interest in the current research programme are represented in Figure 2. This diagram summarises the variables believed to be significant factors in the prediction of health behaviour intention.



**Figure 2: A diagram of the components of interest in study 1**

To conclude, it is the aim of the current research programme to bring the theories mentioned in this chapter and additional components such as past experience and parental behaviour together in an investigation of the possible effects these factors may have on children's health behaviour intentions. In addition, the influence of age and gender on these factors will be examined. Such an investigation will provide an original contribution to the field of Health Psychology building on valid constructs developed for the adult population. Considerations may then arise for further theory development designed specifically for young people, providing a more complete theoretical construct to those mentioned in the previous chapter.

### **4.3 Research Questions**

There are several research questions to be addressed in study 1. It will examine whether children's cognitions, namely their generalised self-efficacy beliefs, health locus of control, health value and perceived personal image beliefs, can significantly predict the health behaviours they intend to perform in the future. The study also questions whether the child's perceptions of the target health behaviours measured by their perceived behavioural image, behavioural importance, behaviour-specific self-efficacy, attitude, outcome expectancy and outcome evaluation can significantly predict future health behaviour intentions. Finally, it questions whether the child's own experience with the behaviours and their observations of their parent's health behaviour practices will have a significant impact on behavioural intentions. When addressing these questions, the influence of school year and gender will be investigated, with the initial question of whether there are any significant differences in the cognitions, health behaviour perceptions, behavioural intentions and health behaviour practices between these two groups.

Study 1 will therefore seek to address the following research questions:

1. Do children's health cognitions, health behaviour perceptions, intentions and practices differ:
  - a) between year group?
  - b) between gender?
  
2. Can children's health behaviour intentions be predicted by:
  - a) their health cognitions
  - b) their health behaviour perceptions
  - c) their own past experience or performance of health behaviour
  - d) their observations of the health behaviours of their parents

It is predicted that an internal locus of control, high self-efficacy beliefs, a high value on health and high levels of behavioural importance, an appropriate perceived image, and positive attitudes, outcome expectancies and outcome evaluations of the target health behaviours will predict the intentions towards the performance of them. It is suggested that behavioural intentions will be further influenced by positive past behaviour experience and preconceptions of the health behaviours believed to develop from observations of parental health behaviour practices.

#### **4.4 Hypotheses**

##### ***Hypothesis 1***

There will be a significant difference in the health cognitions, health behaviour perceptions, behavioural intentions and past health behaviour performance between pupils of year 7 and pupils of year 10.

##### ***Null Hypothesis 1***

There will be no significant difference in the health cognitions, health behaviour perceptions, behavioural intentions and past health behaviour performance between pupils of year 7 and pupils of year 10.

##### ***Hypothesis 2***

There will be a significant difference in the health cognitions, health behaviour perceptions, behavioural intentions and past health behaviour performance between boys and girls.

##### ***Null Hypothesis 2***

There will be no significant difference in the health cognitions, health behaviour perceptions, behavioural intentions and past health behaviour performance between boys and girls.

### ***Hypothesis 3***

The cognitive elements included in the Modified Social Learning Theory for Children model (children's health locus of control, self-efficacy, health value beliefs and personal image) will be significant predictors of the health behaviours children intend to perform in the future.

### ***Null Hypothesis 3***

The cognitive elements included in the Modified Social Learning Theory for Children model (children's health locus of control, self-efficacy, health value beliefs and personal image) will show no predictive influence on the health behaviours children intend to perform in the future.

### ***Hypothesis 4***

The components included in the Modified Theory of Planned Behaviour model (perceived behavioural image, behavioural importance, behaviour-specific self-efficacy, attitude, outcome expectancy and outcome evaluation) will be significant predictors of the health behaviours children intend to perform in the future.

### ***Null Hypothesis 4***

The components included in the Modified Theory of Planned Behaviour model (perceived behavioural image, behavioural importance, behaviour-specific self-efficacy, attitude, outcome expectancy and outcome evaluation) will show no predictive influence on the health behaviours children intend to perform in the future.

***Hypothesis 5***

The child's intention to perform the target health behaviours will be significantly influenced by their previous experience with or performance of the same health behaviours.

***Null Hypothesis 5***

The child's intention to perform the target health behaviours will not be significantly influenced by their previous experience with or performance of the same health behaviours.

***Hypothesis 6***

The child's intention to perform the target health behaviours will be significantly influenced by the health behaviours they observe their parents perform.

***Null Hypothesis 6***

The child's intention to perform the target health behaviours will not be significantly influenced by the health behaviours they observe their parents perform.



## **4.5 Method**

### **4.5.1 Design – Study 1**

Study 1 employed a cross-sectional quantitative survey design. The multiple dependent and independent variables within this design were contingent upon the analysis and the particular hypothesis being addressed. The overall dependent variables for this study were the child's intentions of the four target health behaviours. The independent 'predictor' variables were the child's cognitive beliefs measured from the Modified Social Learning Theory for Children (MSLTc-children's health locus of control, generalized self-efficacy, health value and personal image); the child's perceptions of the four target health behaviours measured by the components of the Modified Theory of Planned Behaviour (MTPB-perceived behavioural image, behavioural importance, behaviour-specific self-efficacy, attitude, outcome expectancy and outcome evaluation), as well as their past health behaviour practices and their observations of the health behaviours their parents perform. All the above variables, however, became dependent variables when first addressing any significant differences between the two independent variables: year group and gender.

As two of the behaviours under investigation are to be promoted (e.g. healthy eating and regular exercise), and the other two are to be prevented (e.g. smoking cigarettes and drinking alcohol), each health behaviour was analysed and addressed separately. However, when the term 'target health behaviour' is used, it is referring to the *adoption* of the two health-enhancing behaviours (healthy eating and regular

exercise) and the *avoidance* of the two health-impairing behaviours (smoking cigarettes and drinking alcohol).

### ***Statistical Analysis***

Data analysis (using SPSS 12.0 software) commenced by examining the internal consistency of the instruments included in the Health Perceptions Questionnaire that was used for data collection. Cronbach's Alpha reliability was calculated for each measure, including those standardised from previous research. Descriptive frequencies for each variable and crosstabulation were then computed to determine the distribution of participants in terms of school age and gender. Following this, MANOVA (multivariate analysis of variance) analyses was performed to identify any significant differences in the study variables between the younger and older children and between boys and girls.

Analysis then proceeded to examine correlational relationships between the study variables, with further correlational analyses controlling for year group and gender. This was followed by a series of multiple regressions in an attempt to test if children's cognitive beliefs, health behaviour perceptions, past behaviour experience and parental health behaviours have any predictive significance for their future intentions to perform/avoid the target health behaviours. These regressions were first computed using the enter method. Finally all variables were subjected to a stepwise regression (separately for each target health behaviour) to determine a statistically significant, age-appropriate theoretical model that predicts health behaviour intentions.

#### 4.5.2 Participants – Study 1

Participants comprised a convenience sample of 529 pupils (259 males, 269 females, 1 not disclosed) from four schools situated in the South East of England. Two year groups were addressed; year 7 (pupils aged 11-12 years) and year 10 (pupils aged 14-15 years). A description of participants can be found below, with cross tabulation figures in Table 1. The schools will be referred to in anonymised form as schools Q, H, M and S.

**Table 1: Total number of participants by year group, gender and school**

School			Gender		Total
			male	Female	
H	Year group	Year 7	59	71	130
	Total		59	71	130
Q	Year group	Year 10	72	86	158
	Total		72	86	158
S	Year group	Year 7	64	70	134
		Year 10	6	4	10
	Total		70	74	144
M	Year group	Year 7	44	29	73
		Year 10	14	9	23
	Total		58	38	96
<b>Overall Total</b>			<b>259</b>	<b>269</b>	<b>528</b>

#### *School Q*

School Q was the first school to agree to take part in the research programme in October 2004. This was an upper school (ages 14 and over), therefore, only pupils in year 10 could be approached. Of the 300 pupils in year 10 attending this school, 180 participated in study 1. Of these, 22 were excluded due to excessive missing data.

Therefore 158 participants (72 male, 86 female) from school Q were entered into final data analysis, with 140 aged 14 years at the time of data collection and 18 aged 15 years. This difference in age would be expected due to the time of year (October 2004) data was collected.

### ***School H***

The research was introduced through a morning assembly at School H, where information was given regarding the nature of the study. Although this school was a senior school (ages ranging from 11-16 years), only year 7 were approached due to a mock examination period for children in year 10. Of the 134 year 7 pupils attending school H, 130 (59 male, 71 female) participated in study 1 through December 2004 to January 2005. Of these, 82 were aged 11 years and 48 aged 12 years.

### ***School M***

Pupils in both year 7 and 10 were approached through school M (a senior school). Of the 205 pupils in year 7 and 199 pupils in year 10, 97 in total (58 males, 38 females, 1 not disclosed) agreed to participate and were included in final data analysis. Of these, 73 pupils (21 aged 11 years, 52 aged 12 years) were in year 7, and 23 pupils (3 aged 14 years, 20 aged 15 years) were in year 10.

### ***School S***

Finally, 144 (70 males, 74 females) pupils agreed to participate from school S. Of these, 134 (21 aged 11 years, 113 aged 12 years) were from year 7 and 10 (aged 14 years) were from year 10.

The significance of the two separate year groups is due to the possibility of increased involvement with the health behaviours of interest with age. The literature discussed in Chapter 2 suggests there is a significant change in health behaviour from 11 to 15 years old. Based on national figures, it can be assumed that the former age group will have had little involvement in the health-impairing behaviours of smoking, drinking alcohol, eating excess junk food, or restricting their eating. As they are still fairly young, it is thought that their perceptions would differ from the older group, who may have been influenced to a greater extent by their peers, (or their own behaviour), and who may already be performing less than healthy behaviours.

#### 4.5.3 Materials – Study 1

After an extensive literature search and communication with a number of the authors of the key theories mentioned previously, five standardised questionnaires and specific questions relevant to testing the hypotheses of this study were compiled. The end product was an instrument designed specifically for the current research programme, entitled the ‘Health Perceptions Questionnaire’ (HPQ). The framework of the components measured in each part of the questionnaire can be seen in Table 2.

**Table 2: Framework of the Health Perception Questionnaire components**

<b>Standardised Tools and Foundation of Measurement</b>	<b>Authors</b>
Children’s Health Locus of Control	Parcel & Meyer, (1978)
Generalised Self-Efficacy Scale	Jerusalem & Schwarzer, (1995)
Health Value Scale	Lau, Hartmen & Ware, (1986)
Image Prototype	Gibbons & Gerrard, (1995)
Theory of Planned Behaviour wordings and response formats	Conner & Sparks, (1995)
Health Behaviour Questions based on Instrument for Monitoring Adolescent Health Issues	Stanton, Willis & Balanda, (2000)

### *Components of the Health Perceptions Questionnaire*

The HPQ consists of a series of questionnaires from Parts A-G, which each had a series of sections and a space on the top right hand corner for a unique reference code to be written. Part A gathered demographic information, and Parts B and C measured the child's observations of their parent's health behaviours. Parts D, E, F, and G measured individual components of each health behaviour; healthy eating, physical activity, avoiding smoking cigarettes and avoiding drinking alcohol respectively. The components measured in each part are presented in Table 3. The full HPQ can be seen in Appendix A.

**Table 3: Components of Parts A-G of the Health Perceptions Questionnaire**

<b>Questionnaire Part</b>	<b>Section</b>	<b>Component</b>
<b>Part A</b>	Section 1	Demographic details
	Section 2	Children's health locus of control
<b>Personal Details</b>	Section 3	Generalised self-efficacy
	Section 4	Health value
	Section 5	Perceived personal image
<b>Parts B &amp; C</b>	Section 1	Healthy eating
	Section 2	Physical activity
<b>Parental Health Behaviours</b>	Section 3	Smoking
	Section 4	Alcohol consumption
<b>Parts D, E, F &amp; G</b>	Section 5	Parental image
	Section 1	Previous behaviour experience
	Section 2	Image of behaviour
<b>Health Eating, Exercise, Smoking, Alcohol Consumption (respectively)</b>	Section 3	Behavioural importance
	Section 4	Behaviour-specific self-efficacy
	Section 5	Intention/attitude/outcome expectancy/outcome evaluation

### *Part A of the HPQ*

Part A focuses on the participants personal details and is split into 5 sections. The first section collects demographic information regarding age and year group, gender, weight and height (collected privately by the researcher to ensure accuracy and confidentiality), ethnicity, family background and the presence of a school nurse.

Section 2 presents the Children's Health Locus of Control (CHLOC) Scale developed by Parcel and Meyer (1978). This is a 20 item scale, with a yes/no response format of 0-20, the lower end of the scale representing an external health locus of control, and the higher end representing an internal health locus of control. Previous use of the scale found no significant differences in CHLOC scores according to gender, and an increase in internal health locus of control with year group/grade (Parcel & Meyer, 1978). The authors report an overall Kuder-Richardson internal consistency reliability coefficient of 0.75 (N=168). The health locus of control (HLC) construct has been widely applied in health psychology, with its origins in Rotter's (1954) Social Learning Theory. This theory holds the assumption that, in a given situation, the likelihood of a behaviour occurring is a joint function of the individual's expectation that the behaviour will lead to a particular reinforcement or outcome and the extent to which this expectation is valued. Within the HLC construct, the main prediction is that those who hold internal locus of control beliefs should be more likely to engage in health-promoting activities. Research on the HLC construct has produced mixed results and, overall, it has been found to be a relatively weak predictor of health behaviour. However, it has been argued that HLC beliefs should predict health behaviour when people value their own health (Wallston, 1992).

Section 4 of Part A, therefore, forms the 'Health Value Scale' (Lau, Hartman & Ware, 1986). The Health Value scale has 4 items and is scored by a likert scale ranging from 1 (strongly agree) to 7 (strongly disagree) with an original Cronbach's alpha of 0.67 (Lau et al, 1986). Questions 1 and 3 are reversed and the 4 items totalled and divided to give an average score ranging between 1 (low health value) to 7 (high health value). Studies which have examined the interaction between internal HLC and health value have generally produced positive results (Shelton Smith & Wallston, 1992; Weiss & Larsen, 1990), although some have found no interaction (Wurtele, Britcher & Saslawsky, 1985). In an attempt to redeem the construct of health locus of control, Wallston (1992) proposed a 'Modified Social Learning Theory'. Within this theory, it is suggested that HLC beliefs are necessary but not sufficient to perform health behaviour. It is argued that health value and self-efficacy beliefs must also be present. Therefore, to perform a health behaviour, an individual must value their health, believe that it is owing to their health-related actions and concurrently believe that they are capable of performing the behaviour in question (Wallston, 1992).

With this theory in mind, Section 3 of the proposed 'Health Perceptions Questionnaire' forms the Generalised Self-Efficacy Scale (Jerusalem & Schwarzer, 1995), which measures perceived self-efficacy (the belief in control over actions). The Generalised Self-Efficacy scale has 10 items measured on a 4-point likert scale with high internal consistency ratings with alphas ranging from 0.82 to 0.93. Summed scores range from 10-40, the higher the score, the higher the self-efficacy belief. Self-efficacy beliefs influence how people motivate themselves and the



behaviours they perform as a result. A strong sense of personal efficacy has been found to be related to better health (Schwarzer & Fuchs, 1995).

Finally, for this part of the questionnaire, Section 5 measures the participants' perceived image of themselves. The concept of image has provided some interesting results in the study of health behaviours such as smoking onset among adolescents and adolescent drinking behaviour. Chassin et al. (1981) found that the self-concepts of adolescents who were currently smoking matched fairly closely the stereotypic image generally associated with smokers. A total of 16 adjectives were used to measure perceived image of children, their parents, and the typical person their age who performs the target health behaviours. These adjectives, based on previous work in the area, (Gibbons & Gerrard, 1995; Gibbons, Gerrard & Boney-McCoy, 1995) were; (1) healthy, (2) exciting, (3) popular, (4) immature, (5) "cool" (sophisticated), (6) unattractive, (7) independent, (8) careless, (9) glamorous, (10) dull (boring), (11) good looking, (12) dirty, (13) successful, (14) unhealthy, (15) uncool, and (16) leader. The 16-item scale measured agreement to these adjectives on a 7-point likert scale ranging from 1 (not at all) to 7 (extremely). Adjectives 4 (immature), 6 (unattractive), 8 (careless), 10 (dull/boring), 12 (dirty), 14 (unhealthy), and 15 (uncool) were reversed prior to analysis. Scores were then totalled and divided to give an average that ranged from 1 (a negative perceived image) to 7 (a positive perceived image). This component was added to the Modified Social Learning Theory for Children (MSLTc) with the assumption that for children, in addition to feeling in control of health-related actions and outcomes, the perceived image they have of themselves may also be important in the development of health behaviour intentions.

### *Parts B and C of the HPQ*

Parts B and C of the HPQ address observations of parental health behaviours. The mother's health behaviours are measured in Part B, the father's in Part C. The term 'parent' refers to the child's primary caregivers termed in the questionnaire as either 'mum' or 'dad'. The questions for both parents are identical, based on questions used in Stanton, Willis and Balanda's (2000) 'Instrument for Monitoring Adolescent Health Issues' (Parts B, D and H). These questions were used to measure the past health behaviours of the children and will be discussed in more detail below. Section 1 measures the parent's healthy eating behaviours. Healthy food is described in the questionnaire as 'foods that are low in fat, sugar and salt and rich in vitamins and fibre'. These terms have been phrased in focus groups when a sample of 300 9-11 year olds were asked to describe healthy eating (Dixey, Sahota, Atwal & Turner, 2001). Section 2 measures perceptions of parental physical activity, Section 3 addresses parental cigarette smoking and Section 4 parental alcohol consumption. This part of the questionnaire advises that alcohol consumption means to consume a unit or more of anything alcoholic, including a glass of wine, a pint of beer, an alcopop, a shot of spirits and so on. The current research programme is interested in the child's perceptions of their parents behaviours as this is believed to be a representation of their own cognitive knowledge and observation of their parents actions. The timeline for each of the health behaviour questions is relatively short 'over the last week'. This is thought to be appropriate, as the interest is with current and/or problem health behaviours exhibited by the parents. Finally, Section 5 will measure the perceived parental image. As with the measurement of their own

perceived image, participants will be asked to comment on their agreement to the 16 adjectives when describing their parents.

### ***Parts D-G of the HPQ***

The final four parts (D-F) have been designed to collect data from the same theoretical backgrounds for each of the four target health behaviours. Part D focuses on healthy eating, Part E on physical activity, Part F on smoking cigarettes and Part G on alcohol consumption. The sections that make up these parts of the questionnaire will be discussed in more detail below.

### ***Section 1***

Section 1 of each of the final four parts of the questionnaire collects information on the participants' past health behaviours and experience. In common with the questions asked of their parent's current health behaviours, participants were asked about their frequency in eating healthy foods. The amount of physical activities they are involved in (including that which may be gained during physical education-P.E. lessons) is measured in Part E. Part F focuses on their smoking behaviours including the frequency and amount of cigarettes (if any) consumed and finally Part G measures their alcohol consumption (if any), including the frequency and amount.

### ***Section 2***

Section 2 of each of the four health behaviour parts (D, E, F and G) measures the typical image of a young person (the participants age) who; eats healthily, exercises regularly, smokes cigarettes, and drinks alcohol. These questions are followed by the

same 16 adjectives, given to describe their parents' image in Parts B and C, and the image of themselves in Part A.

### ***Section 3***

Questions in Section 3 have been developed specifically for this investigation to measure the perceived importance of the target health behaviours (e.g. a healthy diet, regular exercise, avoiding smoking a cigarette, and avoiding drinking alcohol) on present and future health status. The construct of behavioural importance is measured by 2-items on a 5-point likert scale, the scores totalled and averaged to produce a range from 1 (not very important) to 5 (very important). The concept of behavioural importance does not seem to have been accounted for in any of the cognition models within health psychology other than health value, which is not behaviour-specific. Beliefs related to the behaviour, action, costs, benefits, outcome expectancies, control, attitude and so on have been measured and included in previous models, however the value or importance of the behaviour has yet to be documented.

### ***Section 4***

Section 4 gathered information on the participants' behaviour-specific self-efficacy. While generalized perceived self-efficacy is thought important in Wallston's (1992) 'Modified Social Learning Theory', it is also one of the most powerful predictors of health behaviour (Schwarzer & Fuchs, 1995). The concept, first introduced by Bandura (1977) assumes that human motivation and action are facilitated by a personal sense of control. Self-efficacy expectancies are believed to have a direct impact upon behaviour and an indirect effect as a result of their influence upon

intentions (Bandura, 1992; Schwarzer, 1992). If an individual believes that they can take action, they become more inclined to do so, and feel more committed to this decision. Therefore, in addition to measuring each participant's generalised self-efficacy beliefs, it also seems appropriate to measure the self-efficacy beliefs towards each of the target health behaviours. The scales to measure self-efficacy beliefs specific to healthy eating and physical activity are drawn from Schwarzer and Renner, (2000), and follow the wording rule given by Schwarzer and Fuchs (1995) where self-efficacy scales should be worded as 'I am confident that I can (*perform something*), even if (*barrier*)'. The sum of the scores provide the participants' behaviour-specific self-efficacy belief. The literature that guides the development of scales that measure self-efficacy beliefs on health-risk behaviour differs from those used for health-enhancing behaviours. There are two basic methods; one is to present the participant with a list or hierarchy of tempting situations and to assess situation-specific self-efficacy in line with these demands. The second is to measure restricted use of substances, asking subjects whether in general they feel competent to control the behaviour in question (Schwarzer & Fuchs, 1995). The second method of approach is adopted in the current research programme, to measure the behaviour-specific self-efficacy beliefs with regards to not smoking cigarettes and avoiding alcohol consumption. Participants are asked how confident they would feel about abstaining from the behaviour. A question of restricted use on 'special occasions' has also been included for alcohol use, as in this situation, the behaviour is both legally and socially accepted.

### *Section 5*

Finally, Section 5 of the questionnaire Parts D-G, contain variables taken from the Theory of Planned Behaviour. Wordings and response formats for the items were developed using examples from Conner and Sparks (1995). The TPB states any particular behaviour consists of (a) an action (or behaviour), (b) performed on or towards a target, (c) in a context, (d) at a time or occasion. The items adopted in this investigation are intention (question 1), attitude (question 2), behavioural belief/outcome expectancy (question 3) and outcome evaluation (question 4). The items are identical for each of the four target health behaviours.

The first question relating to health behaviour intention is most salient in the current research programme, as all the other variables shall be analysed with health behaviour intention as the dependant variable to establish whether they have any significant influence or predictive ability over the variable. When determining the structure of health behaviour intention items, the aim of the research programme needed to be considered. These intentions are measured by asking to what extent the child intends to; 'eat healthy foods', 'exercise for 30 minutes everyday', 'avoid smoking a cigarette', and 'avoid drinking alcohol' over a time-line of one week on a 7-point likert scale (1 = definitely do not, 7 = definitely do).

Questions relating to attitude (question 2) measure children's personal evaluations of the target health behaviour. Attitudes toward the behaviours were measured with 5 items on a 7-point likert scale (bad (1) good (7), harmful (1) beneficial (7), unpleasant (1) pleasant (7), unenjoyable (1) enjoyable (7), foolish (1) wise (7)). Scores were totaled and divided providing an average attitude score that ranged from

1 (negative attitude) to 7 (positive attitude). Further to attitude, outcome expectancies (or behavioural beliefs) measured in question 3 on a 7-point likert scale (1 = unlikely, 7 = likely) will give an indication of how strongly the individual believes the behaviour in question will improve their health. Finally, the outcome evaluations (question 4) measure the appraisal of how good/bad this 'healthier' outcome is as a result of the behaviour, also measured on a 7-point likert scale (1 = bad, 7 = good).

#### **4.5.3.2 Small Scale Pilot Study**

The main source of data collection in the current research programme was by a survey method. The 'Health Perception Questionnaire' has been developed using many standardised instruments previously tested for their validity and reliability, including the Children's Health Locus of Control Scale (Parcel & Meyer, 1978), the Generalised Self-Efficacy Scale (Jerusalem & Schwarzer, 1995), the Health Value Scale (Lau, Hartman & Ware, 1986), and sections of the Instrument for Monitoring Adolescent Health Issues (Stanton, Willis & Balanda, 2000). The HPQ also includes questions developed following standardised format guidelines (e.g. self-efficacy/Theory of Planned Behaviour) and those thought to be important for the structure of a health behaviour perception (such as the perceived image of individuals who perform health behaviours and the belief in the importance they have on health status). There is no known research incorporating all these measures, and as the HPQ is a new instrument it was deemed necessary to conduct a small-scale pilot study to assess the appropriateness of the questionnaire.

An opportunity sample of ten participants was used for the pilot study. There were five representatives from each of the proposed age groups (11-12 years & 14-15 years) to be addressed in the main study. Participants representing the lower age group were all aged 11 years, with three girls and two boys. Participants representing the older group were all female, three were aged 14 years, and two were aged 15 years.

Children were approached through consenting parents and asked if they wished to participate. The children who expressed an interest in helping were then given an envelope to take home. This contained an information sheet explaining the nature and purpose of the study, a consent form to provide their consent and the 'Health Perception Questionnaire' draft version. Participants were asked to return the sealed envelope directly to the researcher.

Participants were asked to complete the draft questionnaire and then complete the feedback sheet which addressed four main questions. The feedback sheet first asked participants to time how long it took them to complete all sections of the questionnaire. Second, they were asked if there was anything they did not understand, or felt uncomfortable answering. For the third question, participants were given a 10-point likert scale and asked how easy/hard the questionnaire was to fill in (with 1 representing easy and 10 representing hard). Finally, they were asked to comment on how interesting/boring the questionnaire was to fill in, again on a scale of 1-10 (1 = interesting, 10 = boring). They were also given a contact number if they had any questions and told they would be called straight back to avoid any phone charges, however, this contact was not required. Table 4 contains the



information provided from these feedback sheets. Table 5 contains further qualitative information that was given within the questionnaires themselves.

It can be seen from Table 4 that the questionnaire took no longer than 1 hour to complete, with the younger participants taking slightly longer than the older group, which was to be expected. This information indicated the duration of time that needed to be requested when approaching schools for their assistance in this research programme. Depending on the individual school's lesson duration, it was assumed that the questionnaire could be completed during a single lesson. Previous studies in the area (Eiser et al, 1989) have reported a similar time duration (50 minutes) for questionnaire administration with children aged 11-16 years.

**Table 4: Feedback information provided from pilot study**

<b>No.</b>	<b>Age Yrs</b>	<b>Sex</b>	<b>Time Taken</b>	<b>Easy Hard</b>	<b>Interest Boring</b>	<b>Don't Understand</b>	<b>Uncomfortable to answer</b>
<b>Pt 1</b>	11	F	35 mins	8	7	"in a bind"	-----
<b>Pt 2</b>	14	F	30 mins	2	3	"in a bind"	-----
<b>Pt 3</b>	14	F	35 mins	2	2	-----	-----
<b>Pt 4</b>	15	F	30 mins	5	2	-----	-----
<b>Pt 5</b>	15	F	25 mins	2	4	-----	-----
<b>Pt 6</b>	14	F	1 hour	5	3	-----	-----
<b>Pt 7</b>	11	F	1 hour	1	10	...for me thing	About dad
<b>Pt 8</b>	11	F	1 hour	6	6	A few-see in questionnaire	A few-see in questionnaire
<b>Pt 9</b>	11	M	45 mins	6	4	-----	-----
<b>Pt 10</b>	11	M	50 mins	5	4	-----	-----

Further feedback (such as that seen in Table 5) led to the structure and the wording of some of the items in the HPQ being changed.

**Table 5: Additional feedback from questionnaires in pilot study**

No.	Observations made from questionnaire
<b>Pt 1</b>	Did not follow directions to other questions several times
<b>Pt 2</b>	Answered all self-efficacy questions in both smoking and alcohol sections
<b>Pt 3</b>	Missed out how many hours they spend with each parent
<b>Pt 4</b>	Answered all self-efficacy questions in alcohol section
<b>Pt 5</b>	Missed ‘similar to dad’ image question.
<b>Pt 6</b>	Missed ‘similar to mum’ image questions. Answered all self-efficacy questions in both smoking and alcohol sections
<b>Pt 7</b>	Missed ‘similar to mum and dad’ image questions
<b>Pt 8</b>	Missed out ‘similar to mum’ and ‘similar to young person who drinks alcohol’ Missed out whole page for smoking intentions and attitude stating: ‘never smoked’. Missed out intention to avoid alcohol. Answered all self-efficacy questions in both smoking and alcohol sections.

The ratings given for how easy/hard the questionnaire was to complete provided a mean of 4 and a median of 5, both on the ‘easier’ side of the scale. Results show that it was the younger age groups who found the questionnaire more difficult, possibly due to their developmental stage in their literacy skills. The ratings for how interesting/boring the questionnaire was to fill in provided a mean of 4 and a median of 4, again both on the more ‘interesting’ side of the scale. Again, it was the younger children who perceived the questionnaire as less interesting to complete. This difference may be due to the younger age group perhaps having no experience at all with behaviours such as smoking. Furthermore, their parent (s) may have a stronger influence on their eating and exercise patterns.

Participants 1 and 2 both commented that they did not understand the term ‘in a bind’. This term was used in question 9, section 3, of Part A (Personal details). This question was one of ten that made up the Generalised Self-Efficacy Scale (Schwarzer & Jerusalem, 1995). This scale is a standardised instrument drawn from a user’s portfolio containing measures in health psychology (Weinman, Wright & Johnston, 1995). The full question was “If I am in a bind, I can usually think of something to do”. Part A, Section 3 was originally compiled using this instrument. However, as the pilot study revealed question 9 to be a difficult question, further investigation into the scale was made. A revised wording format was found ([www.RalfSchwarzer.de](http://www.RalfSchwarzer.de)) with questions 9 and 10 presented slightly different. In this scale question 9 read “If I am in trouble, I can usually think of a solution”, and question 10 read, “I can usually handle whatever comes my way”, (question 10 in the previous scale was worded, “No matter what comes my way, I’m usually able to handle it”). The two new formats of question 9 and 10 seem to be more appropriate for the age ranges in this study, and as question 9 was a problem for some in the pilot study, it was decided that the new format would be used in the main study.

In addition to these findings, a paragraph on the population suitability was also found that had not been disclosed in the user’s portfolio or seen elsewhere in the literature. This paragraph stated that the scale was designed for use in the general adult population, including adolescents, and should not be used on persons below 12 years of age. This may support one explanation as to why literature testing this theory with children is scarce. Nevertheless, as the youngest age range in this study is 11-12 years, and the author was contacted at the beginning of the research for advice of

projects working with this age range (of which he gave only one 'working with children'), it was decided that this measure would still be included in this study. Since the time of data collection, scales based on the Jerusalem and Schwarzer (1995) scale have been used to collect generalised self-efficacy beliefs in a child sample with the mean ages of 7.9 years and 10.1 years (Lohaus et al, 2004). This provides further justification for the use of the scale in the current research programme.

Participant 7 commented that she did not understand the '...for me thing'. This was reference to question 2, section 5 in Parts D, E, F and G. These questions ask the participant to comment on their attitudes toward the health behaviour. In relation to five sub-likert scales ranging from 1-7 these asked how bad/good, harmful/beneficial, unpleasant/pleasant, unenjoyable/enjoyable and foolish/wise it would be to either stick to a healthy diet, exercise for at least 30 minutes everyday, avoid smoking a cigarette or avoid drinking alcohol, all for the next week. These scales were taken from the standardised item wording and response format measuring the components of the Theory of Planned Behaviour (Conner & Sparks, 1995). The '... for me' was added at the end of all five sub-scale questions so the question read for example, "If I stick to a healthy diet for the next week it would be Bad/Good (response number)...for me". In response to this feedback the wording was modified so that the '...for me' is present after every statement, and not just at the end of all five.

Participant 7 also commented that she felt uncomfortable answering questions about her dad because she did not live with him. It was clear that she had misread or

perhaps not read the instructions stating 'If you do not have close contact with your dad or any other male caregiver who looks after you, please move on to section D'. This statement, along with the other instructions for each part, were therefore moved to the front title page of each part (A-G) of the HPQ for the main study.

A number of other observations were made following analysis of the pilot questionnaires. It can be seen in Table 5 that many of the participants were answering all the self-efficacy questions for the sections relating to smoking and alcohol use. The instructions asked them to answer question 1 if you have never smoked a cigarette/consumed any alcohol, and question 2 if you have smoked in the past but not now/drank alcohol in the past, and for smoking question 3 if you currently smoke. This section was re-worded with the font much larger and bolder in an attempt to limit this issue from arising in the main study.

A few of the participants missed out certain questions, perhaps because they overlooked them as they were going through the materials. The font in the whole set of questionnaires was enlarged, and more colour and pictures were incorporated. The questions for each part were numbered continuously, which run through the separate sections of each part to try to give participants a sequence to follow with the numbering in red, enhancing visibility. Instructions were also altered to make them more visible. Participant 8 missed out a whole page on attitudes and intentions to smoke because she stated she did not smoke. However, for this study, it is important to obtain the attitudes and intentions of both smokers and non-smokers, as even though they do not participate in the behaviour, it is hypothesised they have a

perception of it. Therefore for these pages, participants were instructed to answer all the questions, even if they do not participate in the behaviour.

The final version of The Health Perceptions Questionnaire used in the main study can be found in Appendix A. The set of questionnaires was reproduced in colour, and each part was presented as a separate stapled booklet, with 7 booklets in total per participant.

#### **4.5.4 Procedure and Ethical Considerations**

The ethical framework for the current research programme was constructed in accordance with the British Psychological Society's ethical guidance and ethical approval was granted by the Department of Psychology's ethics committee (University of Luton). An enhanced criminal records bureau (CRB) disclosure was obtained by the researcher prior to any contact with the schools or participants.

The following six ethical issues were taken into consideration: a) Consent, b) Deception, c) Debriefing, d) Withdrawal from the investigation, e) Confidentiality and f) Protection of participants. Each will be discussed separately.

##### ***a) Consent***

Following approval from the Department of Psychology's ethics committee, local schools were contacted to see if they were willing to participate in the research programme. Of ten schools contacted, four local schools agreed to participate. The parents of pupils at participating schools were sent a letter (see Appendix A) which provided an outline of the research programme, contact details of the researcher and

were informed that a copy of the questionnaire to be used in the study could be viewed in the school office. The letter also included a consent form (see Appendix A), which in order for pupils to take part in the study, had to be completed by both the parent and the child. Consent was asked for in two separate places on the form to cover both studies, and the children had the choice of just participating in the first study, or both. A date was given for the return of consent forms via the child's class tutor, which allowed time for the parents to view the questionnaires or raise queries with the school/researcher. Due to a slow response rate initially in one school, a second set of consent forms were sent out (see Appendix A), this time on school-headed paper. This approach provided a much higher response rate and was a strategy adopted in the other schools. It was also the preferred method for the head-teacher as it was felt that this made the research programme personal to the school. Once the consent forms were collected, a suitable timetable for the completion of the questionnaires was agreed between the head of year and the researcher. Children who were not given parental consent to participate, or did not wish to participate in the study were assigned to another class during data collection.

It was recognised that asking children to directly comment on their parents health behaviours may be viewed as a very sensitive issue by some parents, especially those who perform less healthy behaviours. For this reason it is also recognised that some parents may have refused to provide their consent. Unfortunately, this was the view also taken by the head of year at the final school (S) visited, who agreed to allow students to participate only if the parental measures were removed. Due to sampling and time constraints a further school could not be approached, therefore, this request

was upheld. This gave rise to discrepancies in the final data due to missing information and the limitations this caused will be discussed later in the chapter.

It was emphasised to parents that all responses were strictly confidential and anonymous. It was also emphasised that it is not the parental health behaviours of interest, but the child's experience of and exposure to certain health behaviours, measured by those behaviours they believe their parents perform.

In support of asking children to report on their parents' health behaviours, a review of familial influences on adolescent smoking revealed that, of 87 studies reviewed (post 1980), 43 studies assessed both parent and sibling smoking, 42 studies assessed parent smoking only, and two studies assessed sibling smoking only (Avenevoli & Merikangas, 2003). In almost all published studies, surveys were completed at school or in the home, with adolescents reporting on their own tobacco use in all studies. In the majority of studies, adolescents also reported the tobacco use of their parents, siblings and friends, and in this review parental reports of their own smoking behaviours only occurred in 24% of studies. The majority of studies were conducted in the United States, however, there were also a few included from many other countries around the world, including Australia (x8), Canada (x3), China (x2) and Italy (x1). Six were reported to have been conducted in England (Murray, Swan, Johnson, & Bewley, 1983; McNeill, Jarvis, Stapleton, Russell, Eiser, Gammage, & Gray, 1988; Charlton & Blair, 1989; Eiser, Morgan, Gammage, & Gray, 1989; Swan, Carmelli, Rosenman, Fabsitz & Christian, 1990; and Oakely, Brannen, & Dodge, 1992). Adolescents reported on their parental smoking behaviours in all 6 of the



English studies. The age ranges for the studies were 11-12 years, 11-13 years, 12-13 years, 11-16 years, 12-16 years, and 15-17 years respectively.

One major methodological problem observed from the review was that the research was limited by a lack of standardised instruments used to assess tobacco use by adolescents or parents. Most measures employed were survey instruments with the reliability and validity of tobacco questions unknown. This has been one of the major frustrations of this research to date. However, the measures included in this investigation have been designed from many other standardised measures developed to collect data in the areas of interest in this study.

***b) Deception***

There was no need for deception in this study. All research aims were made explicit to parents and participants.

***c) Debriefing***

After completion of the questionnaire participants were given a 'thank you' letter (see final page of the HPQ in Appendix A) to take home with further information of the project and contact details of the researcher. Information on additional care and support for issues that may have emerged after the study were also prepared to be distributed if requested. Following completion of the research programme, all schools involved will receive an executive report of the overall findings and results specific to their school.

*d) Withdrawal from the Investigation*

From the first point of contact and throughout the research programme, participants and their parents were informed that participation was on a voluntary basis and that they could withdraw all or part of their contribution at any time. This right to withdraw was emphasised both by the researcher at each point of contact, and in written statements on the consent form and thank you letter.

*e) Confidentiality*

All information provided for this research programme is completely confidential and the identity of all those taking part will remain anonymous. Parents were informed at the time their consent was sought that the information their child provides will be completely anonymous, with no obvious trace to the individual child. They were informed that as a result of this anonymity, no information can be passed on about a specific child. Participants were assured the information they provided would be kept anonymous and confidential. The anonymity of their participation was emphasised both by the researcher and in written statements in the questionnaire.

Previous research has shown that if anonymity is guaranteed fully, valid responses of socially proscribed behaviours are likely even among young adolescents providing self-reports of drug use (Murray & Perry, 1987). Assurance was given that no one else will see their responses, including their parents, teachers and friends. Previous research has provided such assurances when collecting information on adolescent smoking behaviour (Eiser et al, 1989). To support this, an unsealed envelope was provided to each participant to put their completed questionnaires in and seal. The

importance of the reference codes to keep data anonymous and together was also emphasised.

#### *f) Protection of Participants*

Participants were protected from harm at all times. Physical harm was not an issue in this study, however psychological harm has been carefully considered. Due consideration was given when preparing the Health Perceptions Questionnaire. The contact details of the researcher were provided to all parents and participants in the study to use if they had any questions or concerns regarding the research. This contact was offered for the duration of the research programme.

#### *Venue*

The school classroom was the most desirable venue for data collection. Classes were often 1-hour sessions, which the pilot study revealed as being sufficient time for administration of the HPQ. Questionnaires were distributed in a class of approximately 30 pupils per session. Full standardised instructions were given (see Appendix B), and the researcher stayed in the room in order to address any queries. In accordance with the specified research ethics, each questionnaire contained a reference code that ensured anonymity of the participating pupil and all responses were gathered via a sealed envelope. All participants were thanked and debriefed both verbally and with written statements attached to the research instruments.

## 4.6 Results

### 4.6.1 Demographic Data

Study 1 investigated the health cognitions and health behaviour perceptions of children (N = 529) across two year groups, year 7 (aged 11-12 years) and year 10 (aged 14-15 years), with 49 percent of the respondents male and 51 percent female. The year groups, however, were not as evenly distributed, with 64 percent attributed to year 7 and 36 percent to year 10. These figures can be seen in the cross tabulation in Table 6 below.

**Table 6: Cross tabulation of year group and gender**

			Gender		Total
			male	Female	
<b>Year group</b>	<b>year 7</b>	Count	167	170	337
		% within Year group	49.6%	50.4%	100.0%
		% within Gender	64.5%	63.2%	63.8%
		% of Total	31.6%	32.2%	<b>63.8%</b>
	<b>year 10</b>	Count	92	99	191
		% within Year group	48.2%	51.8%	100.0%
		% within Gender	35.5%	36.8%	36.2%
		% of Total	17.4%	18.8%	<b>36.2%</b>
<b>Total</b>		Count	259	269	528
		% within Year group	49.1%	50.9%	100.0%
		% within Gender	100.0%	100.0%	100.0%
		% of Total	<b>49.1%</b>	<b>50.9%</b>	100.0%

#### **4.6.2 Reliability Analysis**

Prior to the analysis of independent variables, the reliability of the scales were examined. It is useful to measure the reliability of a scale used in a new population to ensure interpretations based on the use of the scale can be made confidently. The reliability calculation is an indicator of the instrument's stability. If it is highly reliable, repeated administration with similar groups of people will produce consistent results. There is some debate surrounding the figure of high reliability, ranging from  $\geq 0.7$  to  $\geq 0.8$ , with a figure between 0.5 and 0.75 regarded as indicating a moderately reliable scale (Hinton, Brownlow, McMurray & Cozens, 2004).

Since items contained in the HPQ use different response formats, seven subscales were generated for analysis: 1) a 20-item subscale of dichotomous responses (*yes-no*) measuring children's health locus of control; 2) a 10-item subscale on a 4-point likert scale measuring generalised self-efficacy beliefs; 3) a 4-item worded subscale with a 7-point likert scale underneath measuring health value beliefs; 4) a 16-item subscale on a 7-point likert scale measuring perceived image (own/behavioural); 5) a 2-item subscale on a 5-point likert scale measuring perceived behavioural importance; 6) a 5-item subscale on a 4-point likert scale measuring behaviour-specific self-efficacy beliefs; and 7) a 5-item subscale on a 7-point likert scale measuring attitude towards behaviour.

The HPQ also presented single item scales measuring previous behaviour, behaviour outcome expectancies, behaviour outcome evaluations and health behaviour intentions. These items, along with those measuring demographic details were not suitable for reliability analysis. Table 7 shows the Cronbach's alpha for each

subscale, along with number of items and participants included in reliability analysis. A disk is appended to this thesis that contains full details of all results including reliability analyses.

**Table 7: Health Perceptions Questionnaire subscale reliability analysis**

Scale		N	No. of items	Cronbach's Alpha
Children's Health Locus of Control		505	20	0.69
Generalised Self-Efficacy		500	10	0.68
Health value		499	4	0.31
Perceived image	Own	466	16	0.76
	Healthy eating	425	16	0.79
	Exercise regular	391	16	0.82
	Smokes cigarettes	383	16	0.81
	Drinks alcohol	338	16	0.81
Behavioural importance	Healthy eating	458	2	0.71
	Regular exercise	433	2	0.71
	Avoid smoking cigarettes	416	2	0.71
	Avoid drinking alcohol	381	2	0.83
Behaviour-specific self-efficacy	Health eating	455	5	0.84
	Regular exercise	424	5	0.82
	Healthy eating	446	5	0.86
Attitude towards behaviour	Regular exercise	420	5	0.89
	Avoid smoking cigarettes	395	5	0.95
	Avoid drinking alcohol	372	5	0.92

***Children's Health Locus of Control Scale – Reliability***

The Children's Health Locus of Control (CHLOC) scale has 20 items that are measured using dichotomous responses of yes or no. Scores from this scale can range from 0-20, with the lower end of the scale representing an external health locus of control, and the higher end of the scale representing an internal health locus of

control. The internal consistency for this scale, as measured by Cronbach's alpha, was a moderately high 0.69.

#### ***Generalised Self-Efficacy Scale – Reliability***

The Generalised Self-Efficacy scale has 10 items measured on a 4-point likert scale (*not at all true (1), barely true (2), moderately true (3), exactly true (4)*). Summed scores range from 10-40, the higher the score, the higher the self-efficacy belief. This scale showed moderate internal consistency with a Cronbach's alpha of 0.68.

#### ***Health Value Scale – Reliability***

The Health Value scale has 4 items and is scored by a likert scale ranging from 1-7 (*strongly agree (1), moderately agree, moderately disagree, strongly disagree (7)*). Summed scores range from 1-7, with a higher score representing a higher value placed on health. The reliability of the scale, as measured by Cronbach's alpha, was low at 0.31, with the possibility of increasing the alpha to 0.32 by the deletion of item 1 (see total item statistics in reliability analyses on the appended disk), a statement suggesting 'there is nothing more important than good health'. This is inconsistent with previous reports of reliability with this scale (Cronbach's alpha = 0.66) in a similar population of 11 to 16 year old girls (N = 97), although in this study, health value was measured on a 5-point scale (Lau et al, 1986).

#### ***Image Scale – Reliability***

Perceived image was measured on a 16-item scale, exploring agreement to a set of adjectives on a 7-point likert scale ranging from 1 (not at all) to 7 (extremely).

Summed scores ranged from 1 (a negative perceived image) to 7 (a positive perceived image).

Measuring perceived self image and peers who perform the health behaviours of interest, this scale showed high reliability with; personal perceived image giving a Cronbach's alpha of 0.76 (N = 466), and a perceived image of the typical person (their age) who ate healthy foods (Cronbach's alpha = 0.79; N = 425), exercised regularly (Cronbach's alpha = 0.82; N = 391), smoked cigarettes (Cronbach's alpha = 0.81; N = 303) and drank alcohol (Cronbach's alpha = 0.81; N = 338).

#### ***Behavioural Importance Scale – Reliability***

Behavioural importance was measured by 2-items on a 5-point likert scale, the scores totaled and averaged had a range of 1 (not very important) to 5 (very important). Analysis showed the scale to be a reliable measurement of perceived importance of healthy eating (Cronbach's alpha = 0.71; N = 458), regular exercise (Cronbach's alpha = 0.71; N = 433), avoiding smoking cigarettes (Cronbach's alpha = 0.71; N = 416), and avoiding drinking alcohol (Cronbach's alpha = 0.83; N = 381).

#### ***Behaviour-Specific Self-Efficacy Scale – Reliability***

Self-efficacy beliefs towards specific health behaviours were measured by either a 5-item scale (healthy eating and regular exercise) or a 1-item scale (avoiding cigarettes and alcohol). The 5-items, measured on a 4-point likert scale (*not at all true (1), barely true (2), moderately true (3), exactly true (4)*) showed high internal consistency with a Cronbach's alpha of 0.84 for the scale measuring healthy eating



self-efficacy beliefs (N = 455), and a Cronbach's alpha of 0.82 for the scale measuring self-efficacy beliefs towards regular exercise (N = 424).

#### ***Attitude Scale – Reliability***

Attitudes toward the target health behaviours were measured with 5 items on a 7-point likert scale with the respective anchor points bad (1) good (7); harmful (1) beneficial (7); unpleasant (1) pleasant (7); unenjoyable (1) enjoyable (7) and foolish (1) wise (7). Scores were totaled and divided providing an average attitude score that ranged from 1 (negative attitude) to 7 (positive attitude).

Internal consistency for the measurement of attitude were found to be high, with a Cronbach's alpha of 0.86 for attitudes towards healthy eating (N = 446), 0.89 for attitudes towards regular exercise (N = 420), 0.95 for attitudes towards avoiding smoking cigarettes (N = 395), and 0.92 for attitudes towards avoiding drinking alcohol (N = 372).

#### **4.6.3 Descriptive Statistics of Study Variables**

Descriptive statistics of variables in the Modified Social Learning Theory for Children-MSLTc (children's health locus of control, generalized self-efficacy, health value, and personal image beliefs), the Modified Theory of Planned Behaviour-MTPB (perceived image, behavioural importance, behaviour-specific self-efficacy, attitude, outcome expectancy and outcome evaluation), health behaviour intention and previous behaviour experience will be presented in three separate sections. This will be followed by a description of the perceptions of parental health behaviours.

#### 4.6.3.1 Descriptive Statistics of MSLTc – Health Cognitions

Table 8 below shows the overall descriptive statistics from the MSLTc. Children’s health locus of control scores were found to be at the higher (internal) end of the scale with a mean average of 15.68 (range 5-20) and a standard deviation of 2.86 (N = 505). Generalized self-efficacy beliefs were also towards the higher end of the scale with an average mean of 28.61 ([SD = 3.73]; range 17-40; N = 500). The average health value beliefs gave a mean mid-score of 4.19 ([SD = 0.99]; range 1.5-7; N = 499), and the belief of personal image revealed a mean score of 4.77 ([SD = 0.73]; range 2.38-7; N = 466).

**Table 8: Descriptive data of health cognitions measured by the MSLTc**

Cognition	N	Mean	SD	Range	Min	Max
Children’s health locus of control	505	15.68	2.86	0-20	5	20
Generalised self-efficacy	500	28.61	3.73	10-40	17	40
Health value	499	4.19	0.99	1-7	1.5	7
Personal image	466	4.77	0.73	1-7	2.38	7

#### 4.6.3.2 Descriptive Statistics of MTPB– Health Behaviour Perceptions

Perceptions of the target health behaviours are presented separately due to the independent nature of the behaviours and the fact that two are described as health-enhancing (healthy eating and regular exercise) and two as health preventive behaviours (avoiding smoking cigarettes and drinking alcohol). These perceptions represent the proposed Modified Theory of Planned Behaviour which include the: typical image of a peer performing the target health behaviour (image); perceived importance the behaviour has to health status (importance); belief in the ability to engage in or refraining from the target health behaviour (self-efficacy); attitudes

toward the performance of the behaviour (attitude); belief in the outcome expected if the behaviour is performed (outcome expectancy) and finally the evaluation of that outcome (outcome evaluation). A brief description of each perception and a table illustrating an overview of all perceptions for the separate health behaviours will be presented below.

### ***Healthy Eating***

The perceived image of a typical young person who eats healthily received a fairly neutral mid-score averaging at 4.82 [SD = 0.77] on a scale ranging from 1-7. The perceived importance of healthy eating however was found to be high with a mean of 4.24 [SD = 0.82], scores ranging from 1-5. Personal control beliefs were also high, showing a mean average score for healthy eating self-efficacy beliefs of 14.49 (range 5-20), although this perception showed a greater deviation from the mean [SD = 3.19]. Attitude scores were towards the higher end of the scale ( $M = 5.17$ ; [SD = 1.52]; range 1-7) showing a more positive attitude towards healthy eating. High values were also found for the expectation that the behaviour would have a positive influence on health ( $M = 5.62$ ; [SD = 1.44]) and the evaluation of this healthier outcome ( $M = 6.11$ ; [SD = 1.18]). These findings are presented in Table 9 below.

**Table 9: Descriptive data for perceptions of healthy eating measured by the MTPB**

<b>Perception</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Range</b>	<b>Min</b>	<b>Max</b>
Image	425	4.82	0.77	1-7	1.75	6.88
Importance	458	4.24	0.82	1-5	1	5
Self-efficacy	455	14.49	3.19	5-20	5	20
Attitude	446	5.17	1.52	1-7	1	7
Outcome expectancy	455	5.62	1.44	1-7	1	7
Outcome evaluation	455	6.11	1.18	1-7	1	7

### ***Regular Exercise***

As can be seen in Table 10 below, perceived image of a young person engaging in regular exercise scored a mean value of 4.93 [SD = 0.81] and had an interesting range of scores (min = 3.13, max = 7), with no scores at the lower (negative image) end of the scale. The behaviour seems to be perceived as being important to health status ( $M = 4.31$ ; [SD = 0.75]), coupled with high beliefs that exercising on a regular basis over the following week would benefit health ( $M = 5.83$ ; [SD = 1.34]) and that this enhancement of health would be good ( $M = 6.21$ ; [SD = 1.08]). Self-efficacy beliefs in the capability of performing the behaviour were above the scales' mid-score ( $M = 14.16$ ; [SD = 3.23]), and attitudes towards regular exercise were also fairly positive ( $M = 5.70$ ; [SD = 1.34]).

**Table 10: Descriptive data for perceptions of regular exercise measured by the MTPB**

<b>Perception</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Range</b>	<b>Min</b>	<b>Max</b>
Image	391	4.93	0.81	1-7	3.13	7
Importance	433	4.31	0.75	1-5	1	5
Self-efficacy	424	14.16	3.23	5-20	5	20
Attitude	420	5.70	1.34	1-7	1	7
Outcome expectancy	428	5.83	1.34	1-7	1	7
Outcome evaluation	429	6.21	1.08	1-7	2	7

### ***Avoiding Smoking Cigarettes***

Perceptions relating to smoking cigarettes were measured in two ways. For most of the components (importance, self-efficacy, attitude, outcome expectancy and outcome evaluation) the measurement was of the *avoidance* of smoking a cigarette. However, the perceived image component measured the image of a typical person the respondent's age who *engaged* in the behaviour (i.e. who smoked cigarettes). Therefore, the mean image perception score presented in Table 11 is positioned

towards the negative end of the scale ( $M = 3.62$ ; [SD = 0.99]). The importance avoiding smoking a cigarette was perceived to be on health was high, with a mean average of 4.60 [SD = 0.80].

The measurement of self-efficacy beliefs varied depending on previous smoking experience. Participants were asked to answer one of three questions, one aimed at those who had never smoked, one aimed at those who had tried a cigarette in the past but do not currently smoke, and one aimed at current smokers, measuring their belief in their ability to avoid smoking a cigarette in the future. Perhaps due to misinterpretation of this question (despite reformatting from feedback in the pilot study), several respondents answered all three questions in this section, limiting the use of this variable. Although it can be seen from Table 11 that self-efficacy beliefs were higher in non-smokers ( $M = 3.50$ ; [SD = 0.88]) than smokers ( $M = 3.15$ ; [SD = 1.05]). Reporting on the avoidance of smoking cigarettes, attitude scores ( $M = 6.00$ ; [SD = 1.77]), outcome expectancy scores ( $M = 6.04$ ; [SD = 1.75]), and outcome evaluation scores ( $M = 6.54$ ; [SD = 1.23]) were all quite high.

**Table 11: Descriptive data for perceptions of smoking behaviour measured by the MTPB**

Perception		N	Mean	SD	Range	Min	Max
Image		383	3.62	0.99	1-7	1	6.81
Importance		416	4.60	0.80	1-5	1	5
Self-efficacy	Never	323	3.50	0.88	1-4	1	4
	Past	180	3.31	0.95	1-4	1	4
	Current	133	3.15	1.05	1-4	1	4
Attitude		395	6.00	1.77	1-7	1	7
Outcome expectancy		399	6.04	1.75	1-7	1	7
Outcome evaluation		400	6.54	1.23	1-7	1	7

### *Avoiding Drinking Alcohol*

Perceptions relating to alcohol consumption were also measured in two ways. All components measured the *avoidance* of drinking alcohol. This was with the exception of the measurement for perceived image which focused on perceptions of peers engaging in drinking alcohol. The average image of a young person drinking alcohol was 3.92 [SD = 0.88], a mid-score directed very slightly towards a negative image. Average scores for the importance of avoiding drinking alcohol were mid to high with a mean of 3.99 [SD = 1.04].

Self-efficacy beliefs were also measured for this behaviour based on previous experience. Participants were asked to answer one of two questions: one aimed at those who had never consumed alcohol, or one aimed at those who had drunk alcohol in the past. Both measured belief in their ability to avoid drinking alcohol in the future. Again, the interpretation of these scores is limited due to multiple entries. However, the scores suggest that those who had tried alcohol were slightly more confident in their ability to control their future intake of alcohol ( $M = 3.24$ ; [SD = 0.89]) when compared to those who had never consumed alcohol in their lifetime ( $M = 3.00$ ; [SD = 1.02]). Attitudes towards avoiding alcohol consumption ( $M = 5.58$ ; [SD = 1.60]), the outcome expectancy ( $M = 5.42$ ; [SD = 1.85]) and outcome evaluation ( $M = 6.06$ ; [SD = 1.38]) were all fairly high. These findings are presented in Table 12.

**Table 12: Descriptive data for perceptions of alcohol consumption measured by the MTPB**

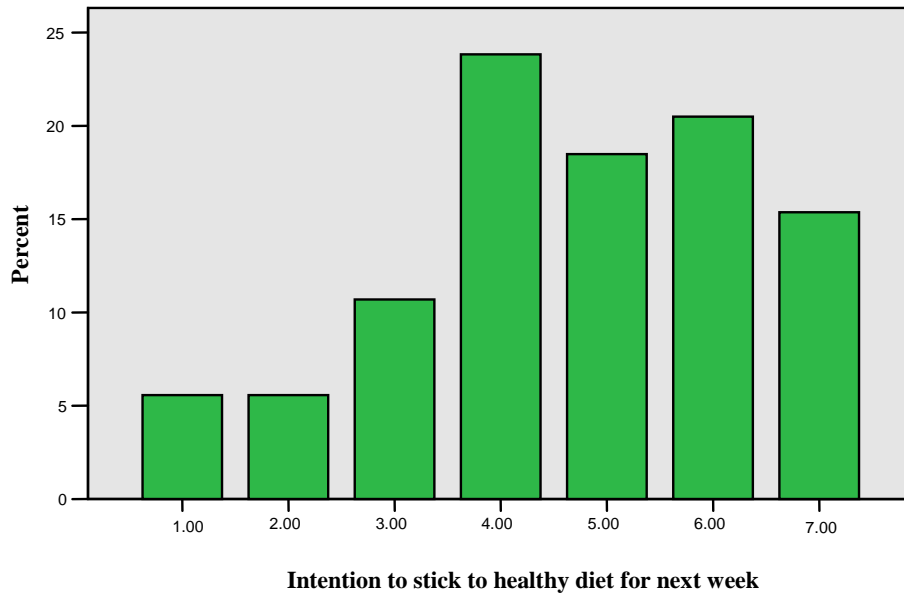
Perception		N	Mean	SD	Range	Min	Max
Image		338	3.92	0.88	1-7	1	6.88
Importance		381	3.99	1.04	1-5	1	5
Self-efficacy	Never	168	3.00	1.02	1-4	1	4
	Past	327	3.24	0.89	1-4	1	4
Attitude		372	5.58	1.60	1-7	1	7
Outcome expectancy		378	5.42	1.85	1-7	1	7
Outcome evaluation		378	6.06	1.38	1-7	1	7

#### **4.6.3.3 Descriptive Statistics for Behavioural Intention and Previous Performance**

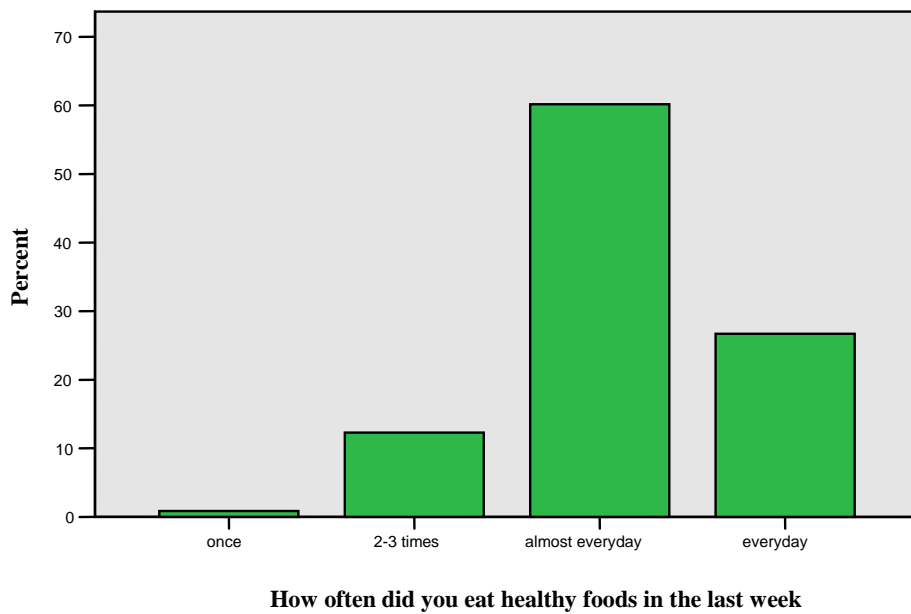
Within the HPQ, a 7-point likert scale measured the intention to perform the target health behaviours over the following week. Questions also addressed the child’s previous engagement (or experience) with each of the health behaviours. Descriptive statistics and bar-graph illustrations of these behavioural intentions and previous performance are reported below.

##### ***Healthy Eating***

A mean average mid-score of 4.67 [SD = 1.67] was found for the intention to stick to a healthy diet for the week following completion of the HPQ. Responses for this behavioural intention were fairly scattered with only 15 percent stating they definitely did intend to stick to a healthy diet the following week. Reporting on behaviour performance, 27 percent reported eating healthy foods everyday and 60 percent eating healthy foods almost everyday in the week prior to the study. The range of intentions and behaviour performance can be seen in Figures 3 and 4.



**Figure 3: Percentage of responses towards the intention to stick to a healthy diet**

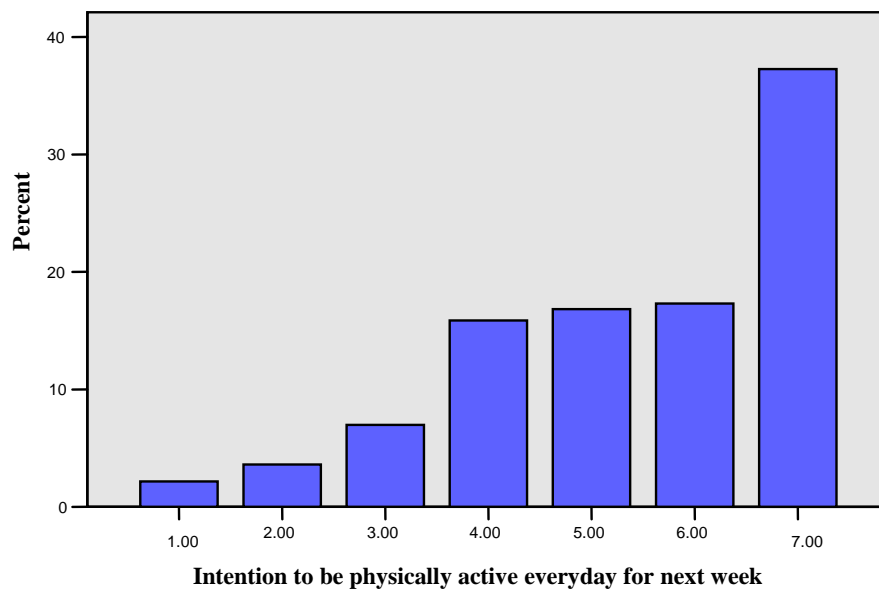


**Figure 4: Percentage of responses towards the performance of eating healthy foods**

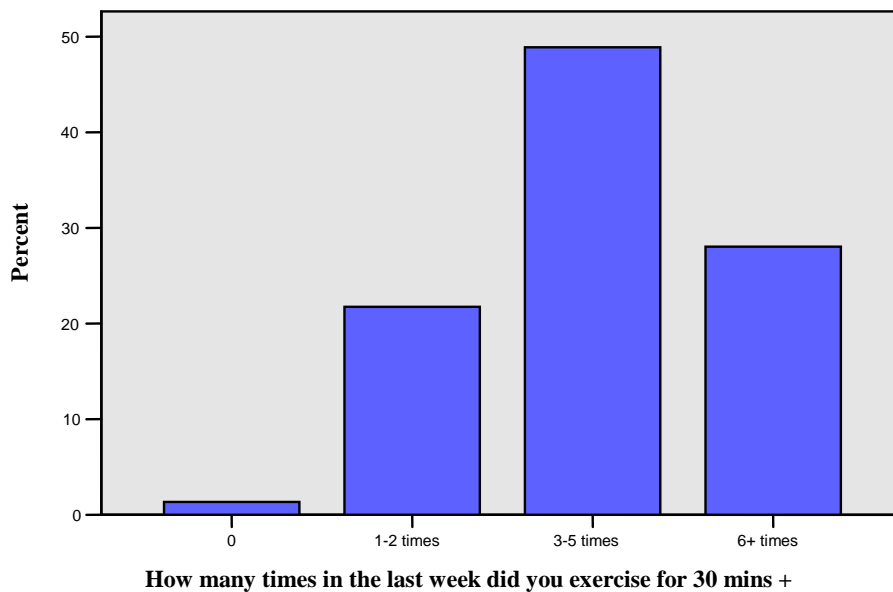


### *Exercise*

Descriptive analysis of the intention to exercise for 30 minutes daily over the week following first contact revealed a relatively high mean of 5.43 [SD = 1.61], with 37 percent of participants stating they definitely intended to perform this behaviour. Reporting on behaviour performance a week prior to data collection, only 1 percent stated they had engaged in no form of physical activity. Over a quarter (28%) of respondents had exercised over 6 times in the previous week, with half (50%) the sample engaging in exercise behaviours 3-5 times. These findings can be seen in Figures 5 and 6 .



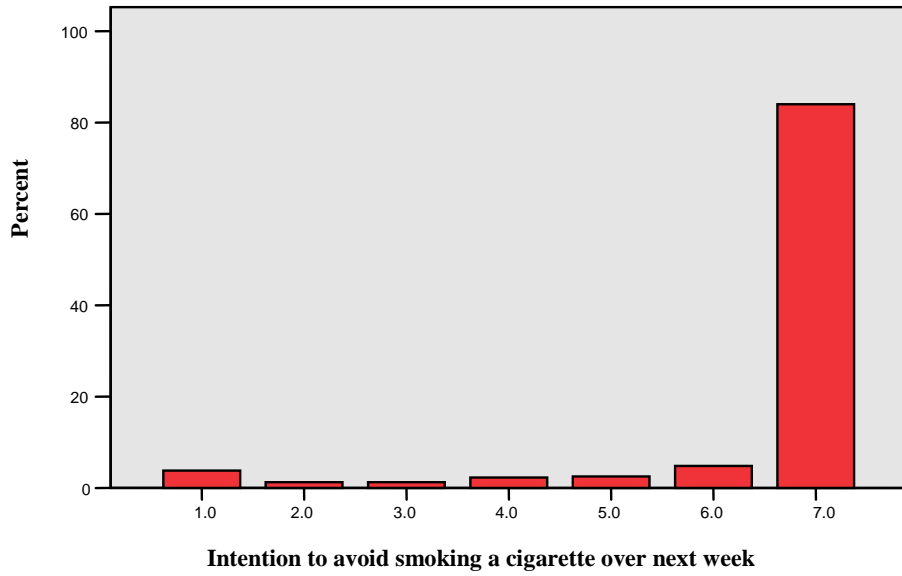
**Figure 5: Percentage of responses towards the intention to exercise everyday**



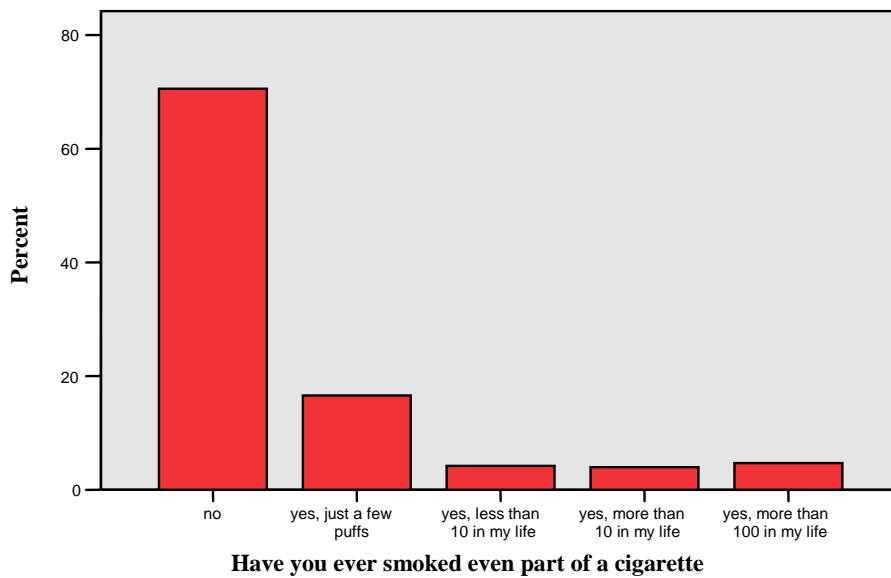
**Figure 6: Percentage of responses towards the performance of exercise behaviours**

### *Avoiding Smoking Cigarettes*

The intention to avoid smoking cigarettes had a high average score ( $M = 6.50$ ; [SD = 1.41]), with 84 percent reporting the intention to definitely avoid the behaviour (see Figure 7). Exploring previous experience with smoking cigarettes, it can be seen from Figure 8 that 70 percent of respondents reported never trying a cigarette. Of the remaining 30 percent who had smoked, 17 percent had tried a few puffs, 4 percent had smoked less than 10 cigarettes, a further 4 percent had smoked more than 10 cigarettes and 5 percent had smoked more than 100 cigarettes in their lifetime. Of those who had smoked, 21 percent reported they had smoked cigarettes in the week prior to data collection, which equates to 5 percent of the whole cohort.



**Figure 7: Percentage of responses towards the intention to avoid smoking cigarettes**



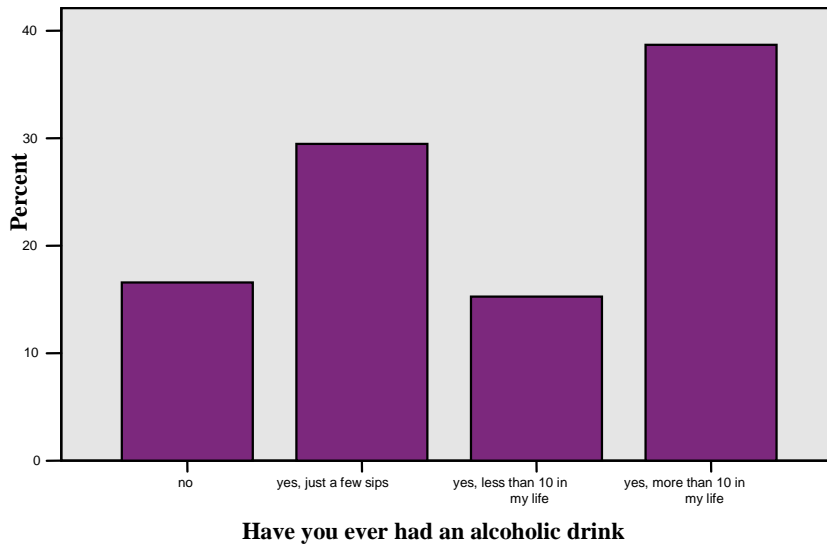
**Figure 8: Percentage of responses toward previous experience of smoking cigarettes**

### *Avoiding Drinking Alcohol*

The intention to avoid drinking alcohol yielded an average score of 5.50 [SD = 1.88], with 48 percent reporting the intention to definitely avoid the behaviour and 6 percent stating they definitely did not (see Figure 9 below). Reports of previous experience with alcohol consumption show that 17 percent of the respondents had never tried alcohol before, 29 percent having tried a few sips. A further 15 percent had consumed no more than 10 drinks and 39 percent had consumed over 10 alcoholic drinks in their lifetime. Of the 83 percent who had tried alcohol, 36 percent reported they had consumed an alcoholic drink the week prior to the study. This equates to 22 percent of the total cohort.



**Figure 9: Percentage of responses towards the intention to avoid drinking alcohol**



**Figure 10: Percentage of responses towards the previous alcohol consumption**

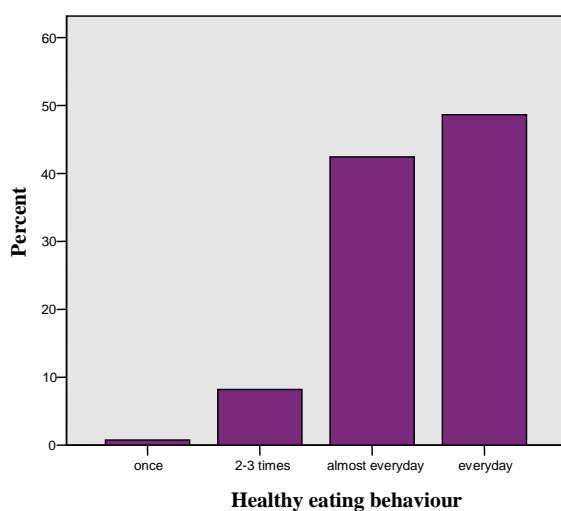
#### **4.6.3.4 Descriptive Statistics for Parental Health Behaviours**

Parental health behaviours were measured using the same scales as those measuring the health behaviours of the children. These perceptions of behaviours were explored separately and will be discussed below.

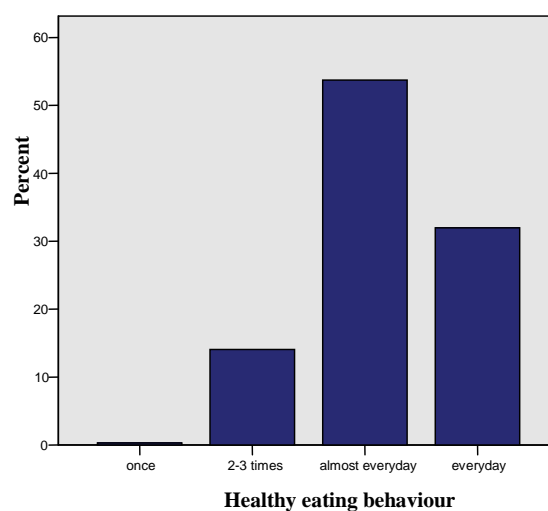
##### ***Parental Healthy Eating Behaviour***

Perceptions of parental eating behaviours were generally good with reports that 49 percent (N = 196) of the mothers and 32 percent (N = 116) of the fathers were eating healthy foods everyday in the week before first contact. A further 42 percent (N = 171) of mothers and 54 percent (N = 195) of fathers were reported to have eaten healthy foods *almost* everyday in this week. Interestingly, less than 1 percent (mother, N = 3; father, N = 1) reported their parents ate healthy foods less than once in the week prior to the study. The overall perceptions of this health behaviour are

illustrated below in Figure 11 for the mother's healthy eating behaviour, and Figure 12 for the father's healthy eating behaviour.



**Figure 11: Mother's healthy eating behaviour**

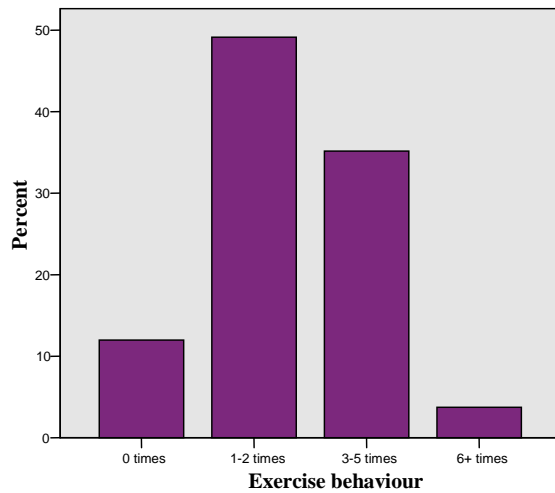


**Figure 12: Father's healthy eating behaviour**

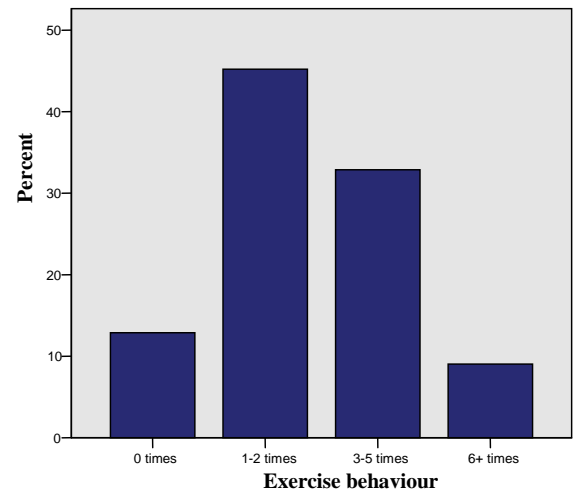
### ***Parental Exercise Behaviour***

Perceptions of the amount of exercise parents had taken over the week prior to study 1 was less positive than that for healthy eating behaviours. Only 4 percent (N = 15) believed their mother had been physically active everyday (6+ times), this figure was only slightly higher at 9 percent (N = 33) for the dads. Perceptions of engaging in no physical activity (0 times) was represented in 12 percent (N = 48) of the mothers and 13 percent (N = 47) of the fathers. Just under half the respondents perceived their parents to be physically active 1-2 times a week (mother 49%; father 45%). The remainder perceived their parents engaged in physical activity 3-5 times a week

(mother 35%; father 33%). The distribution of these perceptions can be seen in Figures 13 and 14.



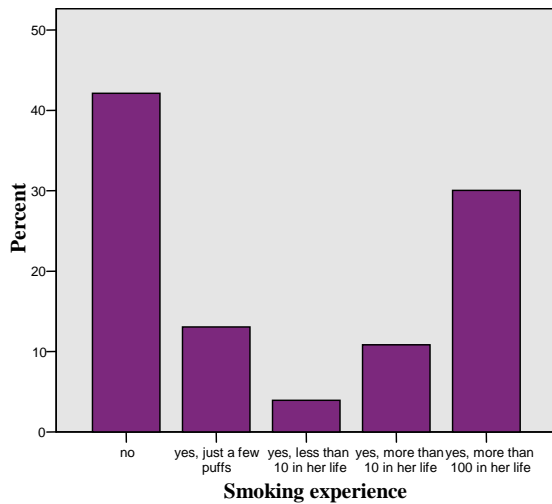
**Figure 13: Mother's exercise behaviour**



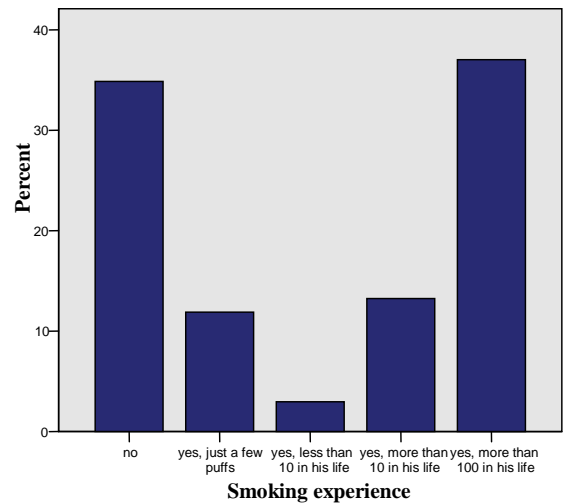
**Figure 14: Father's exercise behaviour**

### *Parental Smoking Behaviours*

Reporting on the parents' smoking behaviour, 42 percent of respondents believed their mother had never tried a puff of a cigarette and 35 percent believed the same for their father. Of the remaining participants, 30 percent believed their mother had and 37 percent believed their dad had smoked more than 100 cigarettes in their lifetime,. Figure 15 illustrates the overall responses for the perceptions of smoking behaviour for the mothers and Figure 16 the smoking behaviour for the fathers. Of the 58 percent of mothers and 65 percent of fathers who were perceived to have tried at least a puff of a cigarette, 41 percent of mothers and 52 percent of fathers were reported to have smoked cigarettes in the week prior to the study. This equates to 19 percent and 24 percent for the parents respectively from the total cohort.



**Figure 15: Mother's smoking experience**



**Figure 16: Father's smoking experience**

***Parental Alcohol Consumption***

A very small number of parents were believed to have never consumed an alcoholic drink in their lifetime (6 percent of mothers and 7 percent of fathers). Over three quarters (76%) believed their mother had drank more than 10 alcoholic drinks in their life, with a greater number (82%) reporting the same for their fathers. However, due to the replication of this question from the children's health behaviour questions, this is a very low number of drinks considering the age of the parents. Reporting on the alcohol consumption of the parents who had at least tried an alcoholic drink, 65 percent of the mothers and 80 percent of the fathers were perceived as drinking alcohol the week prior to the study. This equates to 47 percent and 52 percent of the overall cohort respectively.



#### **4.6.4 Year Group and Gender Differences in Study Variables**

The differences in developmental stages of children in the two year groups observed in this research programme should not be conflated. The health behaviour practices of an 11 year old (year 7 pupil) have been reported as being different to that of a 15 year old (year 10 pupil). Physical activity for example is reported to decrease significantly with age (Misra & Aguilion, 2001) and smoking and alcohol consumption are found to be significantly increasing with age (DoH, 2004; Kurtz & Thornes, 2000). Furthermore, studies investigating health cognitions such as health locus of control beliefs (Parcel & Meyer, 1978) have also reported age-related differences, with younger children (aged 8-9 years) exhibiting lower (more external) health locus of control beliefs than older children (11-12 years). Moreover, gender differences between the health behaviours of interest have also been reported and must therefore be taken into consideration in data analysis. Such analysis will test the hypothesis that age and gender differences will be found in the sample of the current research programme.

A series of MANOVA's (multivariate analysis of variance) were performed on the data set to test for significant differences in the mean scores of health cognitions, health behaviour perceptions, health behaviour intentions and past behaviour between the two year groups and gender. Due to the number of dependant variables measured in study 1, and the number of missing variables, one overall MANOVA was not deemed appropriate to test this hypothesis as there would be a substantial reduction in sample size and a greater risk of Type II error. MANOVA's were conducted for the two theories being tested (MSLTc, MTPB), with a further MANOVA exploring any difference in the mean scores for behavioural intention and

previous behaviour performance. The MSLTc measures generic health cognitions, and was therefore only tested once. The MTPB, however, is a behaviour-specific model and thus required repeated MANOVAs for the four target health behaviours.

#### 4.6.4.1 Modified Social Learning Theory for Children

The combination of the two independent variables (year group and gender) did not produce a significant interaction on the factors included in the Modified Social Learning Theory for Children (CHLOC, GSE, HV, Image);  $F [4, 430] = 0.58$ ,  $p > 0.05$ ; Wilks' Lambda = 0.99. However, significant multivariate effects were found with separate analysis of year group  $F [4, 430] = 14.16$ ,  $p < .001$ ; Wilks' Lambda = 0.88 and gender  $F [4, 430] = 3.68$ ,  $p < .05$ ; Wilks' Lambda = 0.97 respectively. These effects can be seen in Table 13 below.

**Table 13: Main effects of year group and gender on MSLTc health cognitions**

Source	Dependent Variable	df	F	Sig.
Year	CHLOC	1	47.05	.000***
	Self-efficacy	1	0.84	.361
	Health value	1	8.96	.003**
	Own image	1	2.54	.112
Gender	CHLOC	1	3.65	.057
	Self-efficacy	1	5.62	.018*
	Health value	1	0.04	.834
	Own image	1	8.02	.005**
Year * Gender	CHLOC	1	0.29	.593
	Self-efficacy	1	1.13	.289
	Health value	1	0.72	.398
	Own image	1	0.12	.727

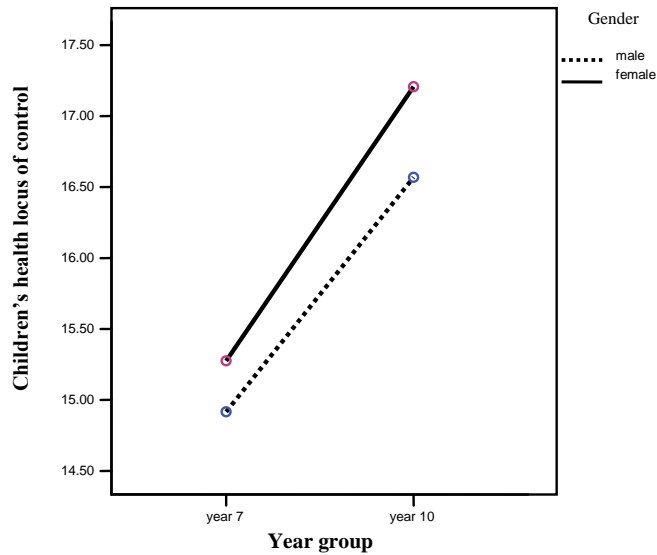
\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Exploring the variation of these mean scores further, it can be seen from Table 13 that differences are observed with year group and children's health locus of control  $F [1, 433] = 47.05, p < .001$  and health value scores  $F [1, 433] = 8.96, p < .01$ ; and gender group and self-efficacy  $F [1, 433] = 5.62, p < .05$  and personal image scores  $F [1, 433] = 8.02, p < .01$ .

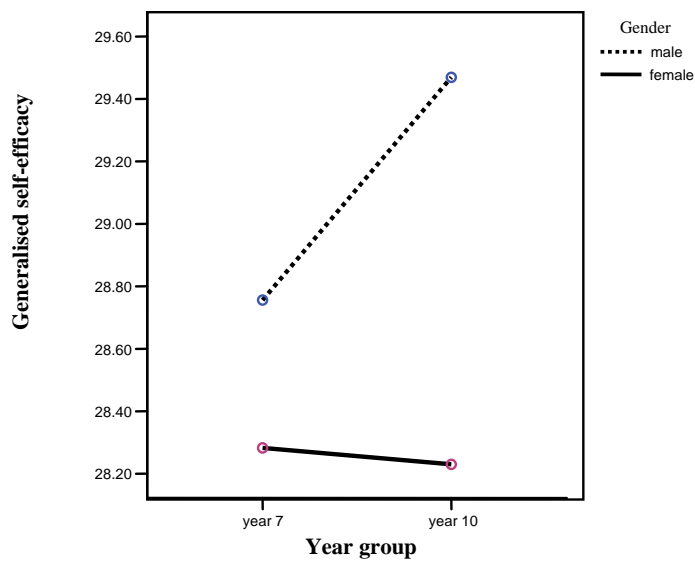
Figure 17 illustrates that, overall, children in year 7 had a lower average score of 15.10 [SD = 2.99] and a wider range in scores (range = 5-20), when compared to 16.90 ([SD = 2.02]; range = 9-20) for year 10 pupils in health locus of control beliefs. Pairwise comparison confirms these differences are significant ( $p < .001$ ) after Bonferroni adjustment for multiple comparisons. This reveals a greater internal locus of control in the older children, which would be expected as the younger children may still rely more on others (external) such as their parents or teachers for their health outcomes. Girls also scored consistently higher (year 7;  $M = 15.28, [SD = 2.98]$ ; year 10;  $M = 17.21, [SD = 1.88]$ ) than boys (year 7;  $M = 14.92, [SD = 3.00]$ ; year 10;  $M = 16.57, [SD = 2.12]$ ) on the children's health locus of control scale. This effect approached the significance level ( $p = .057$ ),  $F [1, 433] = 3.65$ .

MANOVA revealed a significant effect for year group ( $F [4, 430] = 14.16, p < .001$ ; Wilks' Lambda = 0.88) and gender ( $F [4, 430] = 3.68, p < .05$ ; Wilks' Lambda = 0.97) as separate independent variables on the multiple dependant variables of the MSLTc. A significant difference was found for self-efficacy beliefs between the mean scores for boys ( $M = 29.03, [SD = 3.80]$ ) and girls ( $M = 28.26, [SD = 3.55]$ ), with boys holding significantly higher self-efficacy beliefs ( $F [1, 433] = 5.62, p < .05$ ) than girls. These effects can be seen on Figure 18 below. No significant difference

was found between the year groups for the generalized self-efficacy cognition, with year 7 averaging a self-efficacy score of 28.51 ([SD = 3.90]; ranging from 17 to 40) and year 10 a score of 28.83 ([SD = 3.32]; ranging from 19 to 39).

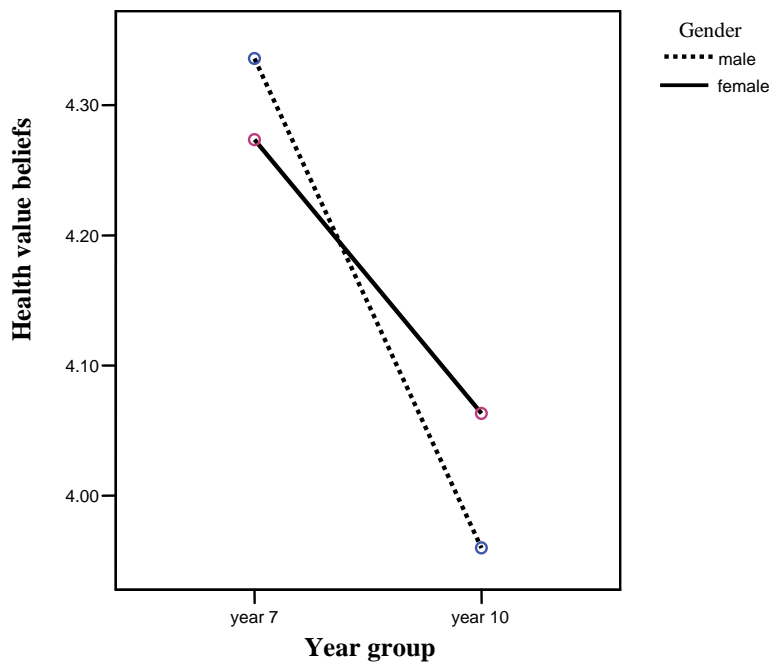


**Figure 17: Main effects of year group and gender on CHLOC beliefs**



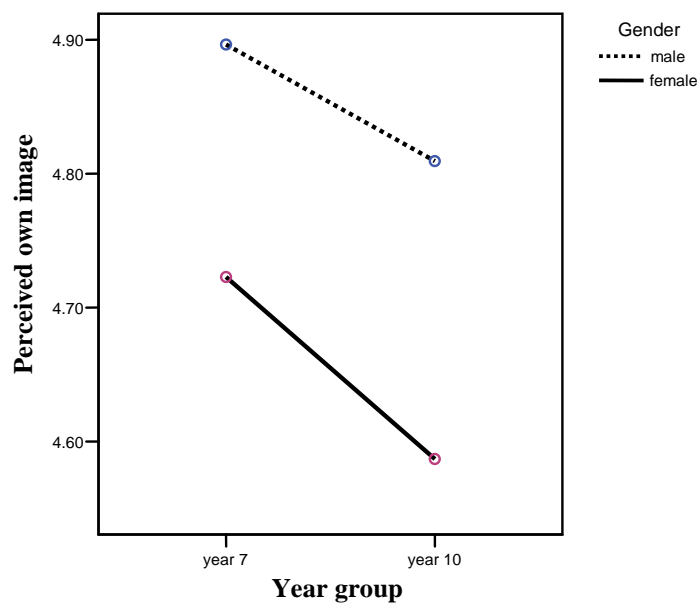
**Figure 18: Main effects of year group and gender on generalised self-efficacy beliefs**

Further to this, an interaction can be seen in Figure 19 between year group and gender on health value beliefs, showing health value beliefs decreasing at a greater rate for boys than girls with age. This effect, however, was not significant ( $p=.398$ ). The main effect of year group and health value is, however, significant  $F [1, 433] = 8.96, p<.01$ , with the younger group expressing a slightly higher value towards health scoring a 4.30 ([SD = 1.05]; scores ranging from 1.5 to 7), compared to the older group who scored an average of 4.01 ([SD = 0.90]; scores ranging from 1.75 to 6.5). This confirms that the younger children in this cohort place a higher value on their health.



**Figure 19: Main effects of year group and gender on health value beliefs**

Finally, the image children held of themselves was not significantly different between the year groups. Children in year 7 gave an average image of 4.81 [SD = 0.78], with children in year 10 expressing an average image of 4.69 [SD = 0.60]. As the scale ranged from 1 (not at all) to 7 (extremely), these scores both sit closely in the neutral part of the scale, neither strongly agreeing or disagreeing with the 16 adjectives when describing themselves. ANOVA did, however, reveal a significant difference between gender ( $F [1, 433] = 8.02, p < .01$ ) for health value, as can be seen in Figure 20 below, with boys reporting a higher (more positive) image of themselves ( $M = 4.88, [SD = 0.72]$ ) than girls ( $M = 4.66, [SD = 0.72]$ ).



**Figure 20: Main effects of year group and gender on perceived own image**

#### **4.6.4.2 Modified Theory of Planned Behaviour**

Multivariate analysis of variance was conducted separately for the four target health behaviours to investigate possible age and gender effects in the scores of components

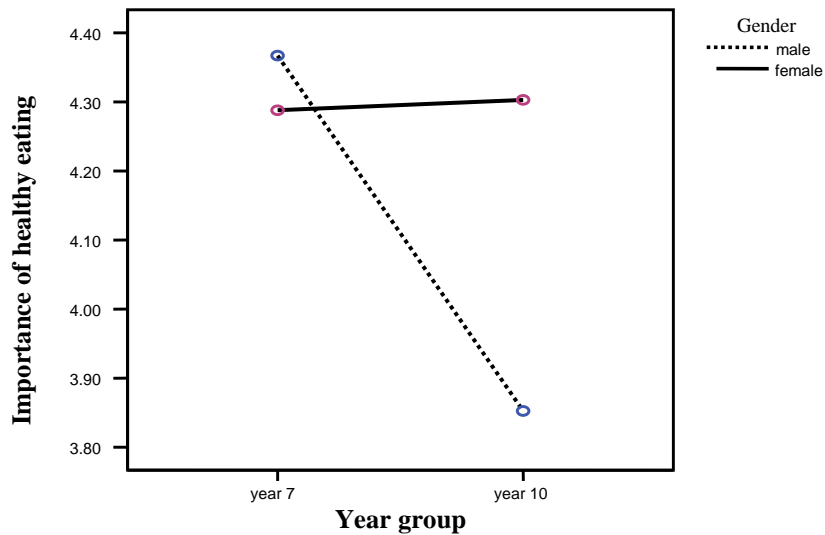
from the Modified Theory of Planned Behaviour; image, importance, self-efficacy, attitude, outcome expectancy and outcome evaluation. Significant effects will be reported below and all main effects and multivariate tests will be presented on the appended disk.

### ***Healthy eating***

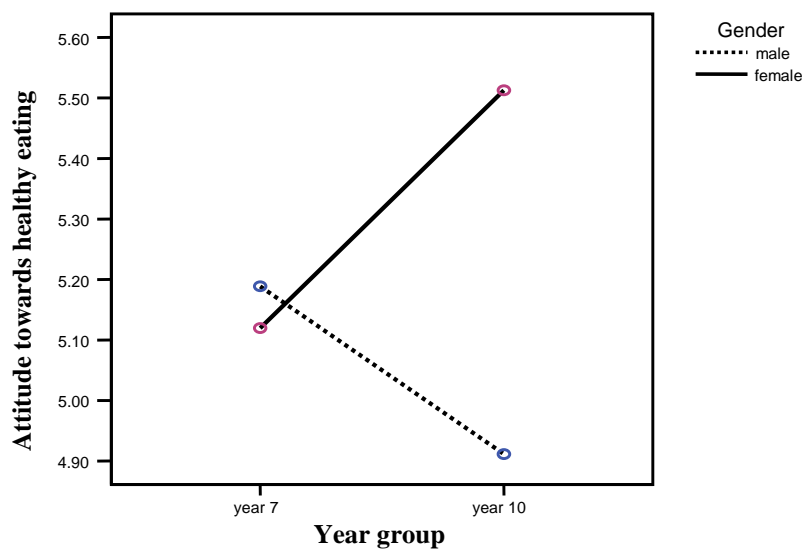
MANOVA revealed a significant interaction between year group and gender on the multiple dependant variables for healthy eating ( $F [6, 379] = 2.79, p < .05$ ; Wilks' Lambda = 0.96). These interactions were attributed to perceived behavioural importance ( $F [6, 379] = 10.51, p < .01$ ) and attitudes towards healthy eating ( $F [6, 379] = 4.11, p < .05$ ). Figure 21 illustrates the effect of year group and gender on behavioural importance where the belief is found to increase with age for girls and decrease in age for boys. A similar effect occurs with attitudes towards healthy eating, with the attitude of girls increasing with age, and the attitude of boys decreasing with age (see Figure 22).

Year group had a significant effect on the multiple healthy eating perceptions ( $F [6, 379] = 3.06, p < .01$ ; Wilks' Lambda = 0.95), while gender had no significant effect ( $F [6, 379] = 1.23, p > .05$ ; Wilks' Lambda = 0.98). Effects of year group were observed for the perceived image of young people who eat healthily ( $F [1, 384] = 7.02, p < .01$ ) and the perceived importance that a healthy diet has on health ( $F [1, 384] = 9.36, p < .01$ ). Further investigation of the image scale revealed that year 7 students scored higher ( $M = 4.89$ ; [SD = 0.83]) than those in year 10 ( $M = 4.68$ ; [SD = 0.67]) suggesting the younger children possessed a more positive image of people who eat healthily. Year 7 pupils also held significantly higher beliefs in the

importance of eating healthy foods with a mean of 4.33 [SD = 0.74] when compared to 4.09 [SD = 0.82] for year 10 pupils. These findings suggest that perceived image and importance of eating healthily decreases with age.



**Figure 21: Main effects of year group and gender on perceived importance of healthy eating**



**Figure 22: Main effects of year group and gender on attitude toward healthy eating**



### ***Regular Exercise***

Examining the health behaviour perceptions relating to regular exercise, no significant effects of year group and gender were identified by MANOVA on the multiple dependant variables in the MTPB ( $F [6, 361] = 1.24, p > .05$ ; Wilks' Lambda = 0.98). In addition MANOVA revealed no significant differences between gender on the multiple dependant variables ( $F [6, 361] = 0.40, p > .05$ ; Wilks' Lambda = 0.99). Significant effects were, however, found between the year groups ( $F [6, 361] = 3.50, p < .01$ ; Wilks' Lambda = 0.95), for the perceived image of a young person who exercises on a regular basis and the self-efficacy belief towards personal exercise.

The perceived image of a young physically active individual significantly decreased from year group 7 to year group 10 ( $F [1, 366] = 7.79, p < .01$ ). Looking at the mean scores directly, year 7 students provided a higher mean of 5.02 [SD = 0.87] compared with that given by year 10 pupils 4.78 [SD = 0.64]. This suggests the younger group hold more positive images of people performing this behaviour. Differences in self-efficacy beliefs were found to be significant ( $F [1, 366] = 6.89, p < .01$ ), with year 7 pupils holding higher beliefs in their ability to take regular exercise ( $M = 14.54$ ; [SD = 3.21]), than the year 10 pupils who reported much lower levels of self-efficacy ( $M = 13.61$ ; [SD = 3.22]).

### ***Avoiding Smoking Cigarettes***

Due to the limitations mentioned previously regarding the measurement of smoking related self-efficacy beliefs, this variable has not been subjected to multivariate analysis of variance as the multiple responses provided by some participants to this

question may perplex any assumptions made from this variable. Analysing the remaining variables (perceived image, behavioural importance, attitude, outcome expectancy and outcome evaluation), MANOVA identified no significant interaction between year group and gender ( $F [5, 345] = 1.12, p > .05$ ; Wilks' Lambda = 0.98). There were also no significant effects of gender ( $F [5, 345] = 0.18, p > .05$ ; Wilks' Lambda = 1.00). Significant effects were, however, indicated for year group on the dependant smoking perceptions ( $F [5, 345] = 3.42, p < .01$ ; Wilks' Lambda = 0.95). The main effect of this significance was attributed to the difference in outcome expectancies towards avoiding smoking cigarettes ( $F [1, 349] = 6.48, p < .05$ ) with younger children expressing higher beliefs that this avoidance would be beneficial to health ( $M = 6.25$ ; [SD = 1.56]) compared to the beliefs of the older children ( $M = 5.76$ ; [SD = 1.87]).

### ***Avoiding Drinking Alcohol***

Alcohol related self-efficacy beliefs were also excluded from multivariate analysis due to the limitations mentioned previously for smoking self-efficacy beliefs. No significant interaction was found between year group and gender on the remaining MTPB perceptions relating to alcohol behaviours ( $F [5, 321] = 0.42, p > .05$ ; Wilks' Lambda = 0.99). Gender differences were also insignificant ( $F [5, 321] = 0.49, p > .05$ ; Wilks' Lambda = 0.99). Differences by year group, however, were highly significant ( $F [5, 321] = 9.90, p < .001$ ; Wilks' Lambda = 0.87) with main effects attributed to each dependant variable (see Table 14).

**Table 14: Main effects of year group on MTPB health perceptions of alcohol related behaviours**

Source	Dependent Variable	df	F	Sig.
Year	Image	1	17.44	.000***
	Importance	1	37.44	.000***
	Attitude	1	12.10	.001**
	Outcome expectancy	1	20.55	.000***
	Outcome evaluation	1	8.89	.003**

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Year 7 students were found to hold a significantly lower (more negative) image of a young person who drinks alcohol ( $M = 3.75$ ; [SD = 1.01]) to that of students from year 10 ( $M = 4.15$ ; [SD = 0.54]);  $F [1, 325] = 17.44$ ,  $p < .001$ . Pupils from year 7 gave a significantly higher value to the importance that avoiding drinking alcohol has on health, with a mean average of 4.27 [SD = 1.01] compared with 3.60 [SD = 0.93] from year 10 pupils;  $F [1, 325] = 37.44$ ,  $p < .001$ . Attitudes towards the avoidance of alcohol were significantly higher for the younger year 7 pupils ( $M = 5.87$ ; [SD = 1.67]) to that of the older year 10 pupils ( $M = 5.26$ ; [SD = 1.32]);  $F [1, 325] = 12.10$ ,  $p < .01$ . Additionally, the outcome expectation that avoiding alcohol would be beneficial to health was significantly higher in the year 7 pupils ( $M = 5.84$ ; [SD = 1.75]) than year 10 pupils ( $M = 4.94$ ; [SD = 1.78]);  $F [1, 325] = 20.55$ ,  $p < .001$ . As was the evaluation that this outcome would be good; year 7 pupils ( $M = 6.28$ ; [SD = 1.33]); year 10 pupils ( $M = 5.84$ ; [SD = 1.26]);  $F [1, 325] = 8.89$ ,  $p < .01$ . Therefore, year 7 pupils held a significantly lower image of young people who drink alcohol, and believed avoiding the behaviour was more important to health than year 10 pupils. The younger year group also held stronger beliefs in their attitude towards the behaviour, the expectation that the outcome of avoiding alcohol would enhance health and the evaluation of this outcome.

#### 4.6.4.3 Behavioural Intention and Previous Behaviour Performance

Possible differences attributed to year group and gender were examined for children's intentions to perform the target health behaviours and their previous experience with these behaviours. Although data for past behaviour experience is categorical, it was deemed appropriate to include it in a single parametric MANOVA test along with the interval scores for behavioural intention (scored 1 [definitely do not] to 7 [definitely do]). This decision is due to the ascending nature of the categories, that have been recoded in rank order (e.g. *healthy eating*: rarely/never (1), once (2), 1-2 times (3), almost everyday (4), everyday (4); *weekly exercise*: 0 times (1), 1-2 times (2), 3-5 times (3), 6+ times (4); *smoking*: never tried (1), a few puffs (2), less than 10 cigarettes in life (3), more than 10 cigarettes in life (4), more than 100 cigarettes in life (5); *alcohol consumption*: never tried (1), few sips (2), less than 10 alcoholic drinks in life (3) more than 10 alcoholic drinks in life (4) ) and the large sample size of the cohort. The future weeks' health behaviour intentions (to stick to a healthy diet, exercise for 30 minutes everyday, avoid smoking cigarettes and drinking alcohol), and past behaviour experience were all analysed in a single MANOVA, with year group and gender as independent variables.

A significant interaction was found between year group and gender on the eight dependant variables; ( $F [8, 292] = 3.32, p < .01$ ; Wilks' Lambda = 0.92). Significant effects were also identified between year group ( $F [8, 292] = 13.31, p < .001$ ; Wilks' Lambda = 0.73) and gender ( $F [8, 292] = 4.67, p < .001$ ; Wilks' Lambda = 0.89) on the dependant variables combined. Main effects can be seen in Table 15.

**Table 15: Main effects of year group and gender on behavioural intentions and previous behaviour experience**

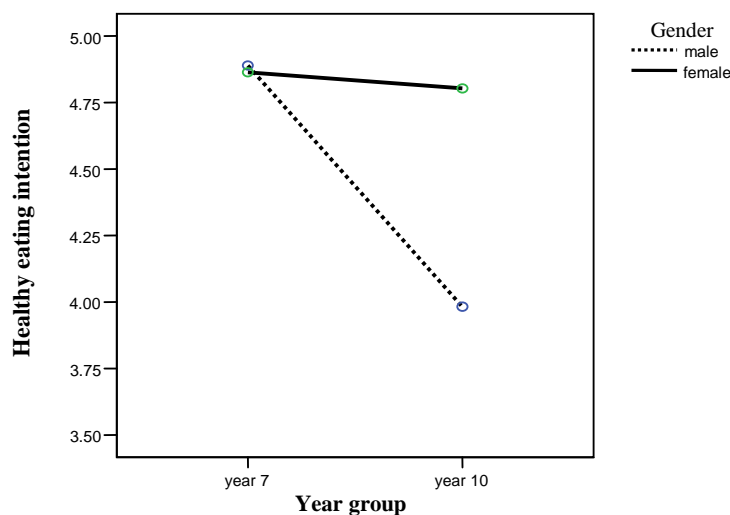
Source	Dependent Variable	Df	F	Sig.
Year	Intention to maintain a healthy diet	1	6.63	.011*
	Intention to be physically active	1	1.77	.185
	Intention to avoid smoking a cigarette	1	1.00	.318
	Intention to avoid drinking alcohol	1	38.39	.000***
	Healthy eating behaviour	1	2.21	.138
	Exercise behaviour	1	6.83	.009**
	Smoking experience	1	23.24	.000***
	Alcohol experience	1	85.50	.000***
Gender	Intention to maintain a healthy diet	1	4.48	.035*
	Intention to be physically active	1	11.98	.001**
	Intention to avoid smoking a cigarette	1	4.14	.043*
	Intention to avoid drinking alcohol	1	0.13	.722
	Healthy eating behaviour	1	0.00	.989
	Exercise behaviour	1	6.94	.009**
	Smoking experience	1	2.67	.103
	Alcohol experience	1	0.93	.337
Year * Gender	Intention to maintain a healthy diet	1	5.08	.025*
	Intention to be physically active	1	2.37	.125
	Intention to avoid smoking a cigarette	1	3.90	.049*
	Intention to avoid drinking alcohol	1	1.53	.218
	Healthy eating behaviour	1	1.04	.308
	Exercise behaviour	1	5.86	.016*
	Smoking experience	1	3.75	.054*
	Alcohol experience	1	1.20	.274

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

It can be seen from Table 15 that the significant interactions identified in the MANOVA between year group and gender were associated with intentions to maintain a healthy diet,  $F [1, 299] = 5.08, p < .05$ , intentions to avoid smoking a cigarette,  $F [1, 299] = 3.90, p < .05$ ; exercise behaviour performance,  $F [1, 299] = 5.86, p < .05$  and previous experience with smoking cigarettes,  $F [1, 299] = 3.75, p < .05$ .

### ***Healthy Eating***

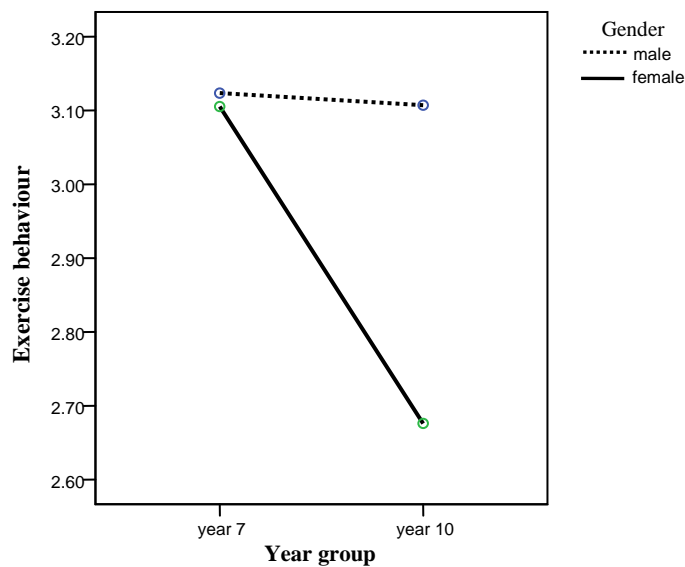
The significant interaction between year group and gender on healthy eating intentions,  $F [1, 299] = 5.08, p < .05$ , can be seen in Figure 23. This shows that while the intentions to eat healthily are similar for boys ( $M = 4.89, [SD = 1.72]$ ) and girls ( $M = 4.86, [SD = 1.62]$ ) in year 7, they are significantly different by year 10 with girls' intentions remaining relatively stable ( $M = 4.80, [SD = 1.37]$ ), while boys' intentions decrease ( $M = 3.98, [SD = 1.68]$ ). Thus suggesting the transition in age does not affect the healthy eating intentions of girls, whilst boys' intentions to eat well reduces with age. Individually, year group had a significant effect on healthy eating intentions  $F [1, 299] = 6.63, p < .05$ , with the younger year group expressing stronger intentions to maintain a healthy diet ( $M = 4.88, [SD = 1.66]$ ) than the older year group ( $M = 4.44, [SD = 1.56]$ ). There was also a significant overall difference in gender regardless of age  $F [1, 299] = 6.63, p < .05$ , with girls expressing higher healthy eating intentions ( $M = 4.84, [SD = 1.51]$ ) than boys ( $M = 4.52, [SD = 1.75]$ ).



**Figure 23: Interactions between year group and gender on healthy eating intentions**

### ***Regular Exercise***

Significant interactions were also found between year group and gender on exercise behaviours in the week prior to the study  $F [1, 299] = 5.86, p < .05$ . Figure 24 shows that exercise behaviours between the genders were again similar in year 7, with an average of 3.21 [SD = 0.83] for boys and 3.11 [SD = 0.69] for girls. By year 10, however, they were significantly different with the behaviour of the boys remaining stable ( $M = 3.11, [SD = 0.81]$ ), while the exercise behaviour of girls decreased ( $M = 2.92, [SD = 0.58]$ ). This suggests that girls exercise levels decrease dramatically with age.



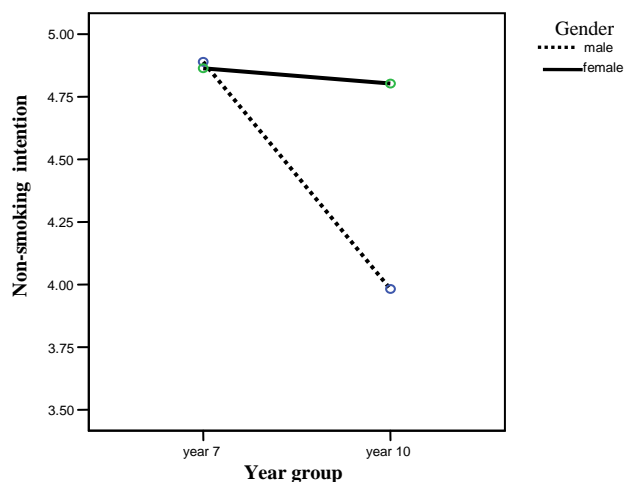
**Figure 24: Interactions between year group and gender on exercise behaviours**

Individually, year group had a significant effect on the previous week's exercise behaviour  $F [1, 299] = 6.83, p < .01$ , with the younger year group performing more exercise ( $M = 3.11, [SD = 0.75]$ ) than the older year group ( $M = 2.87, [SD = 0.72]$ ). Gender differences were also found  $F [1, 299] = 6.94, p < .01$ , with girls engaging in less exercise behaviour ( $M = 2.92, [SD = 0.68]$ ) to boys ( $M = 3.12, [SD = 0.81]$ ).

Furthermore, main effects of gender, irrespective of age, were found with the intention to exercise  $F [1, 299] = 11.98, p < .01$ , with girls showing a lower intention towards the behaviour ( $M = 5.74, [SD = 1.59]$ ) compared to boys ( $M = 5.14, [SD = 1.63]$ ). These findings confirm that exercise behaviour reduces with age, with girls engaging in lower exercise levels compared to boys.

### ***Smoking Cigarettes***

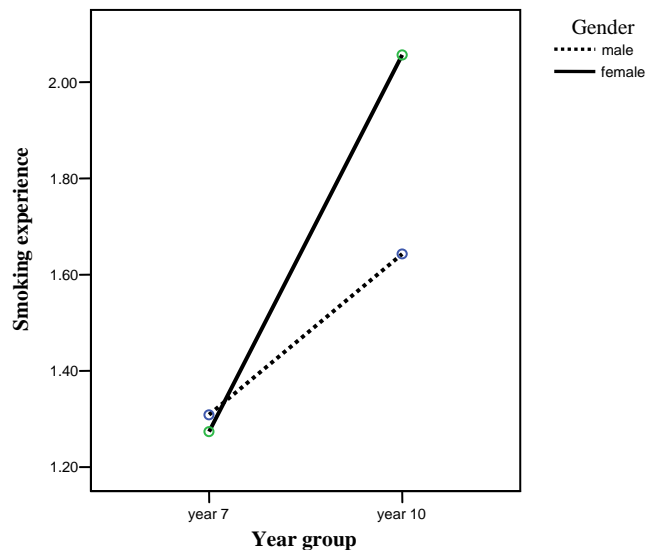
Year group and gender also significantly interact when the intention to avoid smoking cigarettes  $F [1, 299] = 3.90, p < .05$  is considered. This interaction can be seen in figure 25. Both genders have similar intentions towards the avoidance of smoking cigarettes in year 7 (boys:  $M = 6.57, [SD = 1.00]$ ; (girls:  $M = 6.56, [SD = 1.38]$ ), however, with age this intention decreases (boys:  $M = 6.73, [SD = 1.00]$ ; girls: ( $M = 6.06, [SD = 1.87]$ ), although this is not a significant reduction ( $F [1, 299] = 1.00, p > .05$ ). The overall difference between gender is significant  $F [1, 299] = 4.14, p < .05$ , with boys intending to avoid smoking cigarettes at a significantly higher level ( $M = 6.64, [SD = 1.21]$ ) than girls ( $M = 6.34, [SD = 1.62]$ ) irrespective of age.



**Figure 25: Interactions between year group and gender on intentions to avoid smoking**



Year group and gender interactions were finally also found for previous experience with smoking cigarettes  $F [1, 299] = 3.75, p < .05$ , where it can be seen in Figure 26 that smoking behaviour increases with age for both boys and girls. Overall, there was no significant difference found in gender, however, smoking experience significantly increases from year 7 ( $M = 1.29, [SD = 0.64]$ ) to year 10 ( $M = 1.87, [SD = 1.34]$ );  $F [1, 299] = 23.24, p < .001$ .

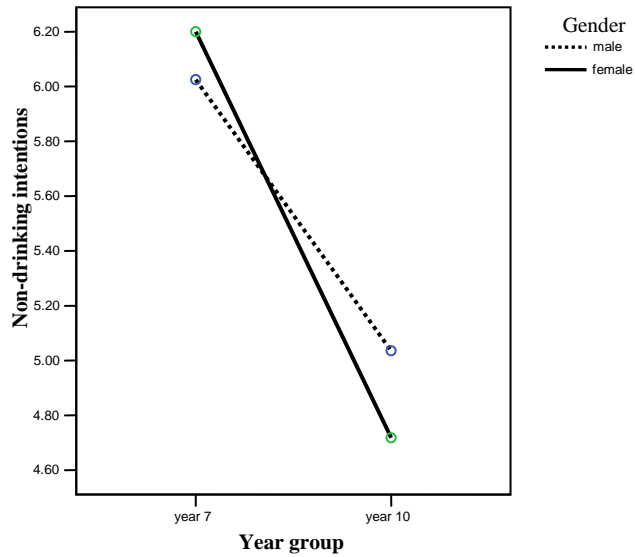


**Figure 26: Interactions between year group and gender on past smoking experience**

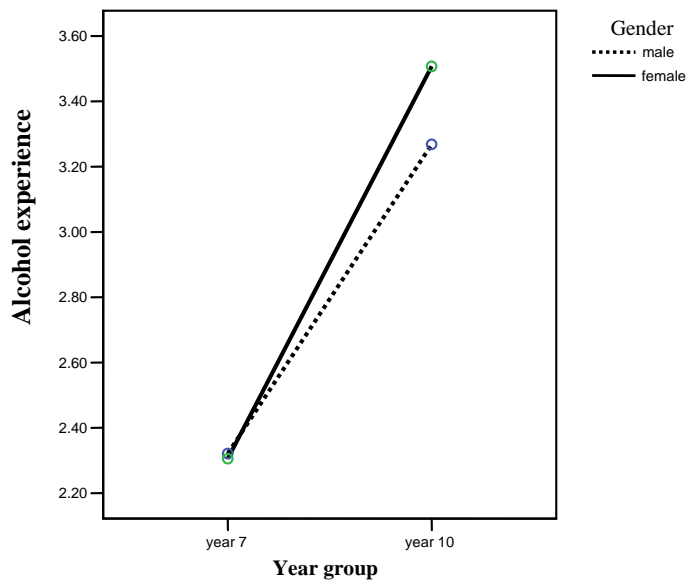
### *Alcohol Consumption*

Final main effects worthy of reporting due to their significance are those of year group on the intentions to avoid drinking alcohol ( $F [1, 299] = 38.39, p < .001$ ) and previous experience with alcohol consumption ( $F [1, 299] = 85.50, p < .001$ ). The intention to avoid drinking alcohol was significantly higher in the younger year group ( $M = 6.12, [SD = 1.58]$ ), the intention decreasing with age to a lower mean of 4.86 [ $SD = 1.86$ ] for the children in the older year group. The experience of drinking

alcohol was also at a lower rate in year 7 ( $M = 2.31$ , [SD = 1.05]) to that of year 10 ( $M = 3.40$ , [SD = 0.90]). These main effects can be seen in Figures 27 and 28.



**Figure 27: Main effects of year group and gender on intentions to avoid alcohol**



**Figure 28: Main effects of year group and gender on previous alcohol experience**

#### **4.6.5 Relationships between Main Study Variables**

To investigate relationships between the study variables, a series of Pearson's correlations were conducted for each of the target health behaviours. It was in the interest of the current research programme to analyse each of the health behaviours separately to address the research questions. However, it is worthy to note at this point that there were significant correlations found between the health behaviour intentions and between the previous health behaviours.

##### ***Inter-correlations – Behavioural Intention***

With regards to behavioural intentions, healthy eating intentions were significantly correlated with exercise intentions ( $r = .43, p < .001$ ); and the intentions to avoid drinking alcohol ( $r = .24, p < .001$ ). The intention to participate in regular exercise was significantly correlated with healthy eating intentions as reported above and with the intention to avoid smoking a cigarette ( $r = .13, p < .01$ ); and the intention to avoid drinking alcohol ( $r = .19, p < .001$ ). In addition to exercise intentions, the intention to avoid smoking a cigarette was significantly correlated with the intention to avoid drinking alcohol ( $r = .29, p < .001$ ). Finally, intentions to avoid drinking alcohol were significantly correlated with all three of the other health behaviours, the values reported above.

Therefore, as expected there were significant inter-correlations between the health behaviour intentions in the current research programme. Children who intended to maintain a healthy diet also intended to take regular exercise and avoid alcohol use. Those who had high exercise intentions also had greater intentions to avoid smoking cigarettes and drinking alcohol. Those who intended to avoid smoking cigarettes

also intended to avoid alcohol use and to take regular exercise. And finally, those who intended to avoid alcohol were more likely to intend to avoid smoking cigarettes and intended to maintain a healthy diet and regular exercise.

### ***Inter-correlations – Previous Behaviour Performance***

With regards to inter-correlations between previous health behaviours, healthy eating was significantly correlated with regular exercise ( $r = .15, p < .01$ ); and negatively correlated with the reported performance of smoking a cigarette ( $r = -.15, p < .01$ ); and drinking alcohol ( $r = -.17, p < .01$ ). Regular exercise behaviours were only significantly correlated with healthy eating, the values reported above. Cigarette smoking was significantly negatively correlated with healthy eating behaviours as reported above and significantly positively correlated with reports of previous alcohol use ( $r = .42, p < .001$ ). Finally, previous alcohol consumption was significantly negatively correlated with healthy eating and significantly positively correlated with previous cigarette use, both values reported above.

Therefore, again as expected there were significant inter-correlations between previous health behaviours in the current research programme. Children who maintained a healthy diet also engaged in regular exercise and were less likely to have tried smoking a cigarette or drinking alcohol. In addition, those who had tried smoking a cigarette had also consumed alcohol in the past.

Although these findings are interesting, it is not in the interest of this research programme to investigate these relationships further. As with much of the previous literature in the area of children's health behaviours, each health behaviour will be

investigated separately. It is acknowledged, however, that the relationships between these behavioural intentions and health behaviours is an area that may warrant further investigation in future research that is specifically interested in multi-behavioural outcome measures.

### ***Correlations between Main Study Variables***

In light of the significant differences found between year group and gender, a further set of correlational analyses were performed specifically investigating relationships between the independent study variables on the overall dependant variable, intention, with the data split for both year group and gender.

### ***Healthy Eating***

Many significant correlations were observed between the study variables for healthy eating behaviours and can be seen in Table 16. The intention to maintain a healthy diet for the week after the study was significantly correlated with children's health locus of control beliefs ( $r = -.11, p < .05$ ); generalized self-efficacy beliefs ( $r = .18, p < .001$ ); health value ( $r = .09, p < .01$ ); personal perceived image ( $r = .19, p < .001$ ); the healthy eating behaviours of the mother ( $r = .16, p < .01$ ) and father ( $r = .21, p < .001$ ); the perceived image of a typical young person who eats healthily ( $r = .23, p < .001$ ); the importance attributed to healthy eating ( $r = .49, p < .001$ ); the personal belief in the ability to perform the behaviour ( $r = .54, p < .001$ ); the attitude towards eating good foods ( $r = .38, p < .001$ ); the outcome expectancy of the behaviour ( $r = .45, p < .001$ ) and the evaluation of this outcome ( $r = .36, p < .001$ ); and finally the previous performance of the behaviour, in this case eating healthily the week prior to the study ( $r = .45, p < .001$ ).

In sum, healthy eating intentions were positively correlated with three of the components of the MSLTc (GSE, HV, image) and negatively correlated with the fourth (CHLOC) which decreased as intentions to eat healthily increased. Healthy eating intentions were also positively correlated and increased with all of the components of the MTPB (image, importance, self-efficacy, attitude, outcome expectancy and outcome evaluation), previous behaviour performance and parental healthy eating behaviours.

In order to investigate whether relationships between intentions to eat healthily and the study variables were influenced by year group and gender, a further correlational analysis was computed with the file split for these two categories. As can be seen in Table 17, findings demonstrate significant positive relationships between healthy eating intentions and behavioural importance, behaviour-specific self-efficacy, attitude, outcome expectancy, outcome evaluation and past behaviour in all categories (i.e. girl year 7, boy year 7, girl year 10, boy year 10). Behavioural image was also correlated with intention in all groups, except year 7 boys. Therefore components of the MTPB showed significant interactions. Components of the MSLTc were not as significant with children's health locus of control correlating negatively with the behavioural intentions of girls in year 7 only. Relationships with health value were also only found with the older boys in year 10. Generalised self-efficacy beliefs significantly correlated with intentions in all groups except the older boys, and perceptions of personal image were only significant in the younger year group. Mother's behaviour correlated with all children's intentions except boys in year 10, and father's behaviour correlated with only the female respondents' intentions.

**Table 16: Correlations between study variables for healthy eating behaviours**

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. CHLOC	.00													
2. Generalised self-efficacy	.05	.00												
3. Health value	-.10**	.02	.00											
4. Own image	-.07	.27***	.07	.00										
5. Mother's behaviour	.10*	.02	.03	.01	.00									
6. Father's behaviour	.06	.08	.00	.09	.38***	.00								
7. Behavioural image	-.05	.15**	.09*	.42***	.01	.13*	.00							
8. Importance	.00	.11**	.16***	.11**	.06	.11*	.23***	.00						
9. Self-efficacy	-.01	.28***	.11*	.26***	.16**	.19***	.11*	.29***	.00					
10. Attitude	.03	.11*	.05	.10*	.14**	.17**	.07	.28***	.32***	.00				
11. Outcome expectancy	-.06	.15**	.13**	.18***	.09*	.09	.15**	.36***	.36***	.36***	.00			
12. Outcome evaluation	.09*	.16***	.12**	.07	.13**	.17**	.16**	.43***	.31***	.38***	.52***	.00		
13. Past behaviour	.01	.20***	.02	.12**	.31***	.32***	.14**	.27***	.40***	.21***	.19***	.30***	.00	
14. Intention	-.11*	.18***	.09*	.19***	.16**	.21***	.23***	.49***	.54***	.38***	.45***	.36***	.45***	.00

One tailed correlations: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

**Table 17: Correlations between healthy eating intentions and study variables split for year group and gender**

Correlation Variables	Year 7		Year 10	
	Male	Female	Male	Female
CHLOC ~ Intention	-.08	-.15*	.16	-.04
Generalised self-efficacy ~ Intention	.31***	.21**	-.04	.22*
Health value ~ Intention	.02	-.02	.29**	.02
Own image ~ Intention	.26**	.18*	.14	.18
Mother's behaviour ~ Intention	.18*	.21*	.09	.25**
Father's behaviour ~ Intention	.17	.27**	.17	.30**
Behavioural image ~ Intention	.11	.26**	.43***	.23*
Importance ~ Intention	.53***	.42***	.60***	.30*
Self-efficacy ~ Intention	.60***	.51***	.48***	.52***
Attitude ~ Intention	.48***	.27***	.31**	.47***
Outcome expectancy ~ Intention	.42***	.48***	.51***	.41***
Outcome evaluation ~ Intention	.36***	.30***	.42***	.46***
Past behaviour ~ Intention	.41***	.47***	.37**	.53***

One tailed correlations: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### *Exercise Behaviours*

Future exercise intentions were significantly correlated with all study variables, with the exception of children's health locus of control and health value, where no significant associations were observed. All relationships were in the expected direction and can be seen in Table 18.



**Table 18: Correlations between study variables for exercise behaviours**

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. CHLOC	.00													
2. Generalised self-efficacy	.05	.00												
3. Health value	-.10*	.02	.00											
4. Own image	-.07	.27***	.07	.00										
5. Mother's behaviour	-.07	.10*	.15**	.12*	.00									
6. Father's behaviour	.01	.04	.01	.11*	.37***	.00								
7. Behavioural image	.01	.16**	-.02	.34***	.17**	.09	.00							
8. Importance	.03	.15**	.04	.12**	.13**	.12*	.23***	.00						
9. Self-efficacy	-.11*	.15**	.10*	.24***	.24***	.11*	.19***	.40***	.00					
10. Attitude	.07	.13**	.01	.13**	.16**	.13**	.15**	.37***	.33***	.00				
11. Outcome expectancy	.04	.17***	.10*	.15**	.10*	.02	.22***	.44***	.32***	.37***	.00			
12. Outcome evaluation	.09*	.18***	.13**	.09*	.19***	.01	.27***	.44***	.28***	.39***	.49***	.00		
13. Past behaviour	-.04	.14**	-.02	.27***	.27***	.27***	.21***	.33***	.44***	.26***	.21***	.21***	.00	
14. Intention	-.02	.18***	.04	.25***	.25**	.12*	.20***	.41***	.50***	.33***	.32***	.26***	.44***	.00

One tailed correlations: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

The intention to engage in 30 minutes of exercise everyday for the week after data collection was significantly correlated with generalized self-efficacy beliefs ( $r = .18$ ,  $p < .001$ ); personal perceived image ( $r = .25$ ,  $p < .001$ ); the exercise behaviours of the mum ( $r = .25$ ,  $p < .01$ ) and dad ( $r = .12$ ,  $p < .05$ ); the perceived image of a typical young person who exercises regularly ( $r = .20$ ,  $p < .001$ ); the importance attributed to regular exercise ( $r = .41$ ,  $p < .001$ ); the personal belief in the ability to perform the behaviour ( $r = .50$ ,  $p < .001$ ); the attitude towards taking regular exercise ( $r = .33$ ,  $p < .001$ ); the outcome expectancy of the behaviour ( $r = .32$ ,  $p < .001$ ) and the evaluation of this outcome ( $r = .26$ ,  $p < .001$ ); and finally the previous performance of the behaviour, in this case the amount of exercise reported for the week prior to the study ( $r = .44$ ,  $p < .001$ ).

A further analysis investigating these relationships between year group and gender identified significant differences. Children's health locus of control beliefs were found to be significantly correlated with the exercise intentions of boys in year 7. Generalized self-efficacy beliefs significantly correlated with both boys and girls exercise intentions in the younger age group, however, no relationship was identified for the older children's behavioural intention. A significant relationship was found with health value and the exercise intentions of boys in year 10, however, no other relationships were found for this variable. Personal image was significantly correlated with the exercise intentions for all groups, with the exception of the older girls. All components of the MTPB and past behaviour significantly correlated with behavioural intentions for all children irrespective of age or gender, with the exception of behavioural image reported by year 7 boys where no relationship was found. Parental behaviour was found to have some association, with the mother's

exercise behaviours correlating with both boys and girls behavioural intentions in year 7 and the father's exercise behaviours with year 7 boys' behavioural intentions only. These findings can be seen in Table 19 below.

**Table 19: Correlations between exercise intentions and study variables split for year group and gender**

Correlation Variables	Year 7		Year 10	
	Male	Female	Male	Female
CHLOC ~ Intention	.18*	-.04	-.11	.04
Generalised self-efficacy ~ Intention	.19*	.18*	.17	.04
Health value ~ Intention	.01	-.05	.20*	.09
Own image ~ Intention	.32***	.23**	.27**	.01
Mother's behaviour ~ Intention	.41***	.25**	.07	.16
Father's behaviour ~ Intention	.29**	.11	-.04	.06
Behavioural image ~ Intention	.11	.21**	.28*	.22*
Importance ~ Intention	.46***	.32***	.42***	.53***
Self-efficacy ~ Intention	.42***	.56***	.44***	.55***
Attitude ~ Intention	.43***	.28**	.26*	.34**
Outcome expectancy ~ Intention	.30***	.40***	.20*	.35**
Outcome evaluation ~ Intention	.23**	.32***	.36**	.22*
Past behaviour ~ Intention	.45***	.49***	.32**	.27**

One tailed correlations: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### *Avoiding Smoking Cigarettes*

Many significant correlations were found for smoking-related behaviours. From Table 20 it can be seen that children's health locus of control and health value were the only components from the MSLTc that were significantly associated with the intention to avoid smoking cigarettes (CHLOC:  $r = .10$ ,  $p < .05$ ; HV:  $r = .09$ ,  $p < .05$ ). All components of the MTPB significantly correlated with the avoidance intention in the expected direction. A negative relationship between behavioural intention and perceived image ( $r = -.19$ ,  $p < .001$ ) indicates that the more negative the perceived image of a smoking peer, the greater the intention is to avoid smoking cigarettes. A

significant association was found with intentions to avoid smoking and the smoking behaviour of the mother ( $r = -.11, p < .05$ ). However, this was a negative relationship suggesting the lower the maternal engagement in the behaviour, the higher the child's intention to avoid the behaviour. No significant association was observed between non-smoking intentions and the father's smoking behaviour. Finally, past experience was negatively correlated with non-smoking intentions. Therefore lower levels of experience were associated with higher intentions to avoid smoking a cigarette.

Further analysis of the relationship between the study variables and intentions to avoid smoking within the two year groups and gender revealed similar findings to those in the overall matrix. Generalised self-efficacy beliefs and personal image continued to have no effect on behavioural intention. The effect of children's health locus of control was found only in the younger boys and the older girls. Furthermore, health value was only significantly associated with the intentions of the boys in the younger year group. Negative relationships were found between parental health behaviours and intentions, with the mother's smoking behaviour associated with the intention to avoid smoking in year 7 boys and the father's smoking behaviour associated with the non-smoking intentions of year 7 girls. No associations were found between parental behaviour and the intentions of the older children to avoid smoking. Past behaviour experience was negatively correlated with all non-smoking intentions except those for year 7 girls. The components for the MTPB were also significantly correlated with behavioural intentions for all groups with the exception of year 7 girls' perceptions of behavioural image and outcome expectancy and the outcome expectancy of year 10 girls. These findings are presented in Table 21.

**Table 20: Correlations between study variables for smoking related behaviours**

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CHLOC	.00												
2. Generalised self-efficacy	.05	.00											
3. Health value	-.10**	.02	.00										
4. Own image	-.07	.27***	.07	.00									
5. Mother's behaviour	-.00	-.08	.01	-.04	.00								
6. Father's behaviour	-.06	-.07	-.03	-.11*	.29***	.00							
7. Behavioural image	-.16**	-.06	.04	.10*	.05	.06	.00						
8. Importance	.20***	.05	.07	-.08*	.05	-.06	-.16**	.00					
9. Attitude	.13**	.09*	.12**	.02	-.11*	-.13**	-.27***	.20***	.00				
10. Outcome expectancy	-.01	.05	.11*	.04	.03	.05	-.12**	.23***	.26***	.00			
11. Outcome evaluation	.17**	.13**	.10*	.01	-.07	-.06	-.21***	.35***	.39***	.37***	.00		
12. Past behaviour	.09*	-.06	-.06	-.00	.14**	.06	.17**	-.22***	-.17***	-.17***	-.07	.00	
13. Intention	.10*	.06	.09*	.02	-.11*	-.09	-.19***	.36***	.40***	.21***	.30***	-.46***	.00

One tailed correlations: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

**Table 21: Correlations between non-smoking intentions and study variables split for year group and gender**

Correlation Variables	Year 7		Year 10	
	Male	Female	Male	Female
CHLOC ~ Intention	.22*	.13	.09	.19*
Generalised self-efficacy ~ Intention	.11	.07	-.08	.10
Health value ~ Intention	.28**	-.05	.16	.02
Own image ~ Intention	-.13	.12	-.05	.02
Mother's behaviour ~ Intention	-.18*	-.15	.14	-.18
Father's behaviour ~ Intention	-.10	-.24**	-.06	.01
Behavioural image ~ Intention	-.35***	.00	-.23*	-.34**
Importance ~ Intention	.33***	.26**	.77***	.29**
Attitude ~ Intention	.64***	.32***	.41***	.35**
Outcome expectancy ~ Intention	.36***	.08	.24*	.11
Outcome evaluation ~ Intention	.58***	.17*	.40***	.25**
Past behaviour ~ Intention	-.18*	-.14	-.62***	-.64***

**One tailed correlations: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$**

### ***Avoiding Alcohol Consumption***

Correlational data of the study variables with reference to alcohol related behaviours can be found in Table 22. Health value was the only component of the MSLTc to correlate with the child's intention to avoid drinking alcohol ( $r = .12, p < .01$ ). Parental alcohol consumption was significantly negatively associated with the child's intention to avoid the behaviour (mother:  $r = -.26, p < .001$ ; father:  $r = -.24, p < .001$ ). Significant correlations were observed with all components of the MTPB, with perceived image again showing a negative relationship ( $r = -.26, p < .001$ ) suggesting the more negative the image towards young people drinking alcohol, the higher the intention is to avoid the behaviour.

**Table 22: Correlations between study variables for alcohol related behaviours**

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CHLOC	.00												
2. Generalised self-efficacy	.05	.00											
3. Health value	-.10**	.02	.00										
4. Own image	-.07	.27***	.07	.00									
5. Mother's behaviour	.28***	-.01	.04	-.15**	.00								
6. Father's behaviour	.28***	-.00	.03	-.06	.70***	.00							
7. Behavioural image	.02	.07	.05	.10*	.09	.18**	.00						
8. Importance	-.07	.01	.24***	.07	-.25***	-.20***	-.27***	.00					
9. Attitude	.05	.03	.11*	.02	-.14**	-.14**	-.25***	.38***	.00				
10. Outcome expectancy	-.10*	.04	.13**	.04	-.26***	-.19***	-.18**	.57***	.43***	.00			
11. Outcome evaluation	.06	.08	.13**	-.01	-.14**	-.09	-.16**	.57***	.49***	.55***	.00		
12. Past behaviour	.29**	-.06	-.14**	-.12**	.44***	.38***	.28***	-.45***	-.28***	-.36***	-.25***	.00	
13. Intention	-.07	-.01	.12**	-.04	-.26***	-.24***	-.26***	.60***	.45***	.53***	.51***	-.50***	.00

One tailed correlations: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

**Table 23: Correlations between intentions to avoid drinking alcohol and study variables split for year group and gender**

Correlation Variables	Year 7		Year 10	
	Male	Female	Male	Female
CHLOC ~ Intention	.11	-.10	.13	.18
Generalised self-efficacy ~ Intention	-.01	.11	-.04	.02
Health value ~ Intention	.10	.04	.03	.10
Own image ~ Intention	-.14	.10	-.12	-.03
Mother's behaviour ~ Intention	-.13	-.06	-.15	-.32**
Father's behaviour ~ Intention	-.13	-.17	-.16	-.19*
Behavioural image ~ Intention	-.24**	-.28**	-.17	-.07
Importance ~ Intention	.57***	.54***	.64***	.41***
Attitude ~ Intention	.27**	.40***	.61***	.48***
Outcome expectancy ~ Intention	.45***	.48***	.62***	.35**
Outcome evaluation ~ Intention	.49***	.51***	.51***	.35**
Past behaviour ~ Intention	-.28**	-.44***	-.48***	-.45***

**One tailed correlations: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$**

Table 23 presents relationships between the study variables and behavioural intention split for year group and gender. It can be seen that there are no significant interactions in the groups between any of the components of the MSLTc and intentions to avoid alcohol. Little effect is also found for parental behaviours, with the alcohol consumption of both the mother and father only showing a relationship with the year 10 girls.

All components of the MTPB show associations with the intention to avoid drinking alcohol in all groups with the exception of a relationship between behavioural image and intention in both the older boys and girls.



#### **4.6.6 Predictors of Health Behaviour Intentions**

The theoretical framework of the Modified Social Learning Theory, postulates that the presence of an internal health locus of control, high self-efficacy beliefs and a high health value are all necessary components for the formation of an intention that is thought to predict health behaviour. A further component, perceived image, has been added to this modified theory based on the assumption that for a younger generation, in addition to possessing beliefs in the controllability of health outcomes and health actions, and a high health value, the perceived image they have of themselves may also be important. For example, if their perceived image is positive, (i.e. scoring high for personal attributes such as being healthy and independent) there may be a stronger desire to maintain this image.

The Modified Theory of Planned Behaviour makes the assumption that the perceived image of a typical person performing a health behaviour, the perceived importance of a health behaviour on health status, self-efficacy beliefs specific to a health behaviour, the attitudes, outcome expectancies and evaluations of the outcome of the performance of a health behaviour all contribute to the prediction of an intention to perform a health behaviour. This theory may be enhanced by the knowledge of previous experience/performance of a behaviour and the observed health behaviours of parents.

In order to determine the most significant predictors of behavioural intention, a series of regression analyses were conducted. Testing the two theories, along with the previous experience and parental behaviours, separate multiple regressions were

performed for the intentions towards, healthy eating, exercise, avoiding smoking cigarettes and avoiding drinking alcohol. As the two theories being tested are informed by previously constructed health cognition models, the enter method regression calculation was employed, forcing the statistical programme to include all independent variables to test the final model.

#### **4.6.6.1 Testing the Modified Social Learning Theory for Children**

Multiple regression analyses were conducted in which components of the MSLTc model were regressed on the intentions towards healthy eating, physical activity, avoiding smoking cigarettes and avoiding drinking alcohol. The independent variables were entered into the equation in six separate steps for each dependant variable. Year group was entered into the first step and gender in the second, to control for their effects. At the third step, children's health locus of control was entered, followed by generalized self-efficacy beliefs at the fourth step. At the fifth step health value was entered, and in the six and final step, personal perceived image.

Table 24 presents the results of these analyses in the form of standardized beta weights (and their significance), details of the variance accounted for by each variable and the final R squared value for the model. The findings are discussed below in relation to each outcome variable.

#### ***Healthy Eating***

Regression analysis showed the MSLTc to be a weak but significant model ( $F [6, 391] = 8.14; p < .001$ ), with 1 percent of the variance explained by children's health

locus of control, 4 percent by generalized self-efficacy beliefs, and 2 percent by personal perceived image. Health value showed no significant effect on the variance of healthy eating intentions. A further 2 percent was explained by year group and 2 percent by gender. The MSLTc model, together with year group and gender explained 11 percent of the variance in terms of the intention to eat healthy foods.

### ***Regular Exercise***

Exercise behaviour intentions were best explained by generalized self-efficacy beliefs and perceived personal image, which both explained 3 percent of the variance. No evidence was found for the effects of children's health locus of control or health value. Year group (2%) and gender (4%) explained a further 6 percent of the variance. The total variance accounted for in exercise intentions by the MSLTc model, taking into account age and gender, was 12 percent.

### ***Avoiding Smoking Cigarettes***

The intention to avoid smoking cigarettes was best explained by children's health locus of control, which accounted for 2 percent of the variance, and health value which accounted for a further 1 percent. No effects were observed for generalized self-efficacy beliefs or personal image. Year group explained a further 1 percent of the variance, with the total MSLTc model, including year group and gender explaining only 5 percent of the variance in intentions to avoid smoking cigarettes.

### *Avoiding Drinking Alcohol*

The MSLTc failed to predict any of the variance in terms of intentions to avoid alcohol. Year group however was observed to predict 14 percent of the variance in intentions to avoid alcohol.

### *Summary*

The Modified Social Learning Theory for Children was identified as a weak but significant model in predicting healthy eating and exercise intentions. When the effect of year group and gender were held constant, the MSLTc model explained 7 percent of the variance for healthy eating intentions and 6 percent of the variance for exercise intentions. Components from the model explained only 3 percent of the variance of intentions to avoid smoking a cigarette, and failed to show any effect on intentions towards drinking alcohol, with year group explaining 14 percent of the variance. These findings build on the observations of the correlations reported previously and it can be concluded from this data that the MSLTc model is a weak (in the case of alcohol, insignificant) predictor of health behaviour intention.

**Table 24: Results of multiple regression analyses for components of MSLTc model (standardized beta and R<sup>2</sup> change values)**

Predictors		Healthy Eating	Physical Activity	Avoiding Cigarettes	Avoiding Alcohol
Year group		-.16**	-.12*	-.11*	-.38***
	<b>Step 1 R<sup>2</sup></b>	<b>.02**</b>	<b>.02*</b>	<b>.01*</b>	<b>.14***</b>
Year group		-.16**	-.12*	-.11*	-.38***
Gender		.12**	-.21***	-.06	.05
	<b>Step 2 R<sup>2</sup> change</b>	<b>.02*</b>	<b>.04***</b>	<b>.00</b>	<b>.00</b>
Year group		-.13**	-.13**	-.16**	-.40***
Gender		.13**	-.21***	-.07	.05
CHLOC		-.08	.04	.16**	.05
	<b>Step 3 R<sup>2</sup> change</b>	<b>.01</b>	<b>.00</b>	<b>.02**</b>	<b>.00</b>
Year group		-.14**	-.14**	-.16**	-.40***
Gender		.15**	-.19***	-.06	.05
CHLOC		-.09	.03	.16**	.05
GSE		.21***	.17**	.06	.01
	<b>Step 4 R<sup>2</sup> change</b>	<b>.04***</b>	<b>.03**</b>	<b>.00</b>	<b>.00</b>
Year group		-.14**	-.14**	-.15**	-.39***
Gender		.15**	-.19***	-.07	.05
CHLOC		-.08	.03	.16**	.06
GSE		.21***	.16**	.05	.01
Health value		.05	.02	.09	.07
	<b>Step 5 R<sup>2</sup> change</b>	<b>.00</b>	<b>.00</b>	<b>.01</b>	<b>.00</b>
Year group		-.13**	-.13**	-.15**	-.39***
Gender		.17**	-.17**	-.07	.04
CHLOC		-.08	.04	.16**	.05
GSE		.17**	.11*	.06	.03
Health value		.04	.01	.09	.07
Personal image		.16**	.19***	-.01	-.06
	<b>Step 6 R<sup>2</sup> change</b>	<b>.02**</b>	<b>.03***</b>	<b>.00</b>	<b>.00</b>
<b>MSLTc Model + year group + gender</b>	<b>Total R<sup>2</sup></b>	<b>.11</b>	<b>.12</b>	<b>.05</b>	<b>.16</b>

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001

#### **4.6.6.2 Testing the Modified Theory of Planned Behaviour**

Further multiple regression analyses were conducted to examine the components of the MTPB model on the four behavioural intentions. For each dependant variable, the behaviour-specific independent variables were entered into the equation in separate steps. Eight steps were entered for the health promotive intention relating to healthy eating and physical activity, and seven steps (excluding behaviour-specific self-efficacy for reasons discussed earlier in the chapter) for the avoidance intentions relating to smoking cigarettes and drinking alcohol. At the first step year group was entered, followed by gender in the second step to control for any influence they may have on the prediction of the health behaviour intentions. At the third step perceived image of a typical young person performing the behaviour was entered. Behavioural importance was entered at the fourth step. At the fifth step behaviour-specific self-efficacy beliefs were entered for healthy eating and exercise intentions, however, as these were not analysed for intentions to avoid smoking and alcohol, attitude beliefs were entered into the fifth step for these avoidance intentions. At the six, seventh and eighth step of the health promotive intentions (healthy eating and exercise), attitude, outcome expectancy and outcome evaluations were entered (respectively), the latter two being entered at the six and seventh step of the regression exploring the avoidance (of smoking and alcohol use) intentions. The standardized beta weightings and details of the total variance accounted for by each step from these analyses are presented in Table 25, followed by a discussion of the findings in relation to each behavioural intention.

**Table 25: Results of multiple regression analyses for components of MTPB model (standardized beta and R<sup>2</sup> change values)**

Predictors		Healthy Eating	Physical Activity	Avoiding Cigarettes	Avoiding Alcohol
Year group		-.16**	-.12*	-.11*	-.38***
	<b>Step 1 R<sup>2</sup></b>	<b>.02**</b>	<b>.02*</b>	<b>.02*</b>	<b>.14***</b>
Year group		-.16**	-.12*	-.11*	-.38***
Gender		.12**	-.21***	-.06	.05
	<b>Step 2 R<sup>2</sup> change</b>	<b>.02**</b>	<b>.04***</b>	<b>.00</b>	<b>.00</b>
Year group		-.13**	-.10	-.10	-.34***
Gender		.13**	-.20***	-.05	.05
Image		.22***	.17**	-.19***	-.18**
	<b>Step 3 R<sup>2</sup> change</b>	<b>.05***</b>	<b>.03**</b>	<b>.04***</b>	<b>.03***</b>
Year group		-.07	-.09*	-.09	-.18***
Gender		.11**	-.21***	-.06	.02
Image		.12**	.09	-.13**	-.08
Importance		.45**	.39***	.34***	.52***
	<b>Step 4 R<sup>2</sup> change</b>	<b>.19***</b>	<b>.14***</b>	<b>.11***</b>	<b>.23***</b>
Year group		-.05	-.04	.	.
Gender		.09**	-.19***	.	.
Image		.11**	.05	.	.
Importance		.33***	.25***	.	.
Self-efficacy		.42***	.38***	.	.
	<b>Step 5 R<sup>2</sup> change</b>	<b>.16***</b>	<b>.12***</b>	.	.
Year group		-.06	-.05	-.09*	-.17***
Gender		.08*	-.18***	-.06	.02
Image		.11**	.05	-.05	-.04
Importance		.30***	.22***	.29***	.44***
Self-efficacy		.38***	.35***	.	.
Attitude		.17***	.12**	.33***	.24***
	<b>Step 6 R<sup>2</sup> change (Step 5 R<sup>2</sup> change)</b>	<b>.02***</b>	<b>.01**</b>	<b>.10***</b>	<b>.05***</b>
Year group		-.06	-.05	-.09	-.15**
Gender		.09*	-.18***	-.06	.01
Image		.10**	.04	-.05	-.05
Importance		.26***	.19***	.28***	.35***
Self-efficacy		.34***	.34***	.	.
Attitude		.13**	.10*	.32***	.19**
Outcome expectancy		.17***	-.07	.04	.20***
	<b>Step 7 R<sup>2</sup> change (Step 6 R<sup>2</sup> change)</b>	<b>.02***</b>	<b>.00</b>	<b>.00</b>	<b>.02***</b>
Year group		-.06	-.05	-.10*	-.16***
Gender		.09*	-.18***	-.06	.01
Image		.10**	.04	-.05	-.05
Importance		.26***	.19***	.26***	.31***
Self-efficacy		.34***	.34***	.	.
Attitude		.13**	.10*	.30***	.16**
Outcome expectancy		.18***	.07	.01	.17**
Outcome evaluation		-.02	-.00	.08	.12*
	<b>Step 8 R<sup>2</sup> change (Step 7 R<sup>2</sup> change)</b>	<b>.00</b>	<b>.00</b>	<b>.01</b>	<b>.01*</b>
<b>MTPB Model</b>					
<b>+ year group + gender</b>	<b>Total R<sup>2</sup></b>	<b>.48</b>	<b>.36</b>	<b>.27</b>	<b>.48</b>

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001

### ***Healthy Eating***

Healthy eating intentions were best explained by behavioural importance and behaviour-specific self-efficacy beliefs accounting for 19 percent and 16 percent of the variance respectively. Perceived image accounted for a further 5 percent, with attitude and outcome expectancy both explaining a significant 2 percent of the variance. The outcome evaluation was the only insignificant predictor of the model. Year group (2%) and gender (2%) accounted for a further 4 percent of the variance. The final model, including age and gender explained 48 percent of the variance in healthy eating intentions. No evidence was provided for the effect of outcome expectancy or outcome evaluation, and attitude beliefs explained only one percent of the variance.

### ***Regular Exercise***

Behavioural importance and behaviour-specific self-efficacy beliefs were also the best predictors of regular exercise intentions accounting for 14 percent and 12 percent of the variance respectively. No evidence was found for the effect of outcome expectancy or outcome evaluation, and attitude beliefs explained 1 percent of the variance. Perceived image accounted for a further 3 percent of the explained variance, with gender contributing an additional 4 percent and year group a further 2 percent. The total variance accounted for by exercise behaviour intentions by year group, gender and the MTPB model was 36 percent (30% attributed to the model once year group and gender were held constant).

### ***Avoiding Smoking Cigarettes***

Gender was found to have no significant effect on the intention to smoke cigarettes, with year group explaining 2 percent of the variance. The most influential predictors



of the MTPB model were behavioural importance which accounted for 11 percent of the variance in intentions and attitude beliefs which explained a further 10 percent. Outcome expectancy was again found to be an insignificant predictor of the intention not to smoke, with outcome evaluation explaining a mere 1 percent of the variance. A further 4 percent of the variance was accounted for by perceived image, with the overall model explaining 27 percent of the variance in the intention to avoid smoking cigarettes (25% once year group and gender were controlled for).

### ***Avoiding Drinking Alcohol***

The total variance explained by the MTPB, including year group and gender was 48 percent. Of this percentage, a high proportion (14%) was attributed to year group with gender having no significant effect. Behavioural importance was found to be the strongest predictor of the intention to avoid drinking alcohol, explaining 23 percent of the variance. A further 5 percent of the variance was observed to be related to attitude, 3 percent to perceived image, 2 percent to outcome expectancy beliefs and 1 percent to outcome evaluations. The overall model, after accounting for age, explained 34 percent of the variance in alcohol avoidance intentions.

### ***Summary***

In summary, behavioural importance was found to be the strongest predictor of all the target health behaviour intentions. Behaviour-specific self-efficacy beliefs were strong predictors for health enhancing intentions of healthy eating and regular exercise. Perceived image was identified as contributing to a smaller extent to the overall variance, with little or no significant effect from outcome expectancy and outcome evaluation. Attitude is a strong predictor for intentions to avoid smoking

cigarettes and, to a lesser extent, intentions to avoid alcohol consumption. However the predictive value of attitude is weaker for intentions to healthily and exercise. Year group was a strong predictor of alcohol related intentions, and contributed to a small amount of the variance in each model.

#### 4.6.6.3 The Influence of Past Behavioural Experience

Previous experience with behaviour has not been included in any of the existing cognition models reported in this thesis, however it has been identified in the literature as a significant predictor of future behavioural intention (Hagger et al, 2002). Regression analyses were therefore performed to explore the effect that previous behaviour performance has on the four health behaviour intentions in this study. Separate multiple regression analyses were computed for each of the outcome variables, controlling as before for year group and gender. The results of these analyses are presented in Table 26 below and will be discussed below.

**Table 26: Results of multiple regression analyses for previous behavioural experience (standardized beta and R<sup>2</sup> change values)**

Predictors		Healthy Eating	Physical Activity	Avoiding Cigarettes	Avoiding Alcohol
Year group		-.16**	-.12**	-.11*	-.38***
	<b>Step 1 R<sup>2</sup></b>	<b>.02**</b>	<b>.02**</b>	<b>.01*</b>	<b>.14***</b>
Year group		-.16**	-.12**	-.11*	-.38***
Gender		.12**	-.21***	-.06	.05
	<b>Step 2 R<sup>2</sup> change</b>	<b>.02**</b>	<b>.04***</b>	<b>.00</b>	<b>.00</b>
Year group		-.12**	-.07	.05	-.18**
Gender		.12**	-.14**	-.04	.06
Past behaviour		.44***	.41***	-.47***	-.42***
	<b>Step 3 R<sup>2</sup> change</b>	<b>.19***</b>	<b>.16***</b>	<b>.20***</b>	<b>.13***</b>
<b>Past behaviour + year group + gender</b>	<b>Total R<sup>2</sup></b>	<b>.23</b>	<b>.22</b>	<b>.21</b>	<b>.28</b>

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Past behaviour was observed to be significant for all of the behavioural intentions predicting between 13 to 20 percent of the variance. After controlling for year group and gender, past behaviour explained 19 percent of the variance in healthy eating intentions, 16 percent of the variance in intentions to exercise, 20 percent in the intention to avoid smoking a cigarette and 13 percent of the variance in alcohol related intentions. Past behaviour experience and performance were therefore significant predictors of future behavioural intention in this cohort.

#### **4.6.6.4 The Influence of Parental Health Behaviours**

The influence of parental health behaviours on the health behaviours of their children was minimal with the mother's health behaviours providing the strongest effects. Again controlling for year group and gender in the first two steps, the health behaviours of the mother and father were entered into a series of multiple regressions testing their influence on the dependant health behaviour intentions. The mother's health behaviour accounted for 3 percent of the variance towards healthy eating intentions, 6 percent of the variance towards exercise intentions, and 2 percent of the variance towards avoiding the consumption of alcohol. A further 1 percent of the variance was accounted for in terms of the intention to avoid cigarettes, however this was not a significant effect. The father's health behaviour explained 3 percent of the variance for healthy eating intentions. No significant effect was found on exercise or smoking related intentions, however, a non-significant 1 percent of the variance in intentions to avoid alcohol was explained by the father's alcohol-related behaviour. The results of parental effects are presented in Table 27.

**Table 27: Results of multiple regression analyses for parental health behaviours (standardized beta and R<sup>2</sup> change values)**

Predictors		Healthy Eating	Physical Activity	Avoiding Cigarettes	Avoiding Alcohol
<b>Year group</b>		-.16**	-.12*	-.11	-.38**
	<b>Step 1 R<sup>2</sup></b>	<b>.02**</b>	<b>.02*</b>	<b>.01</b>	<b>.14***</b>
Year group		-.16**	-.12*	-.11	-.38***
<b>Gender</b>		.12*	-.21***	-.06	.05
	<b>Step 2 R<sup>2</sup> change</b>	<b>.02**</b>	<b>.04***</b>	<b>.00</b>	<b>.00</b>
Year group		-.16**	-.06	-.10	-.33***
Gender		.13*	-.21***	-.05	.05
<b>Mother's Behaviour</b>		.17**	.25***	-.11	-.15**
	<b>Step 3 R<sup>2</sup> change</b>	<b>.03**</b>	<b>.06***</b>	<b>.01</b>	<b>.02**</b>
Year group		-.16**	-.06	-.10	-.33***
Gender		.13*	-.22***	-.04	.05
Mother's behaviour		.10	.24***	-.09	-.08
<b>Father's behaviour</b>		.17**	.03	-.07	-.10
	<b>Step 4 R<sup>2</sup> change</b>	<b>.03**</b>	<b>.00</b>	<b>.00</b>	<b>.01</b>
<b>Parental behaviour + year group + gender</b>	<b>Total R<sup>2</sup></b>	<b>.09</b>	<b>.11</b>	<b>.03</b>	<b>.17</b>

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

#### 4.6.7 Testing the Study Variables Combined – Searching for a New Model

The salient objective of this thesis is not only to test previous theories, but also to test components of these theories demonstrated in previous studies to be significant predictors of health behaviour intentions in an attempt to construct a set of cognitive components that together predict the health behaviour intentions of children.

A further series of multiple regression analyses were conducted using the stepwise method in an attempt to extract the most significant predictors of health behaviour intention. As there are observed differences between year group and gender, these two control variables were entered into the regression analyses in two separate steps, with all remaining independent variables entered in the third and final step. Results

from the multiple regressions for each of the four health behaviours of interest can be found in Tables 28, 29, 30 and 31 and the findings are discussed below.

### ***Predictors of Healthy Eating Intentions***

Seven components were revealed as significant predictors of healthy eating intentions in multiple regression analysis using the stepwise method after controlling for year group and gender. These components were regressed in a hierarchical model that identified behaviour-specific self-efficacy as the strongest predictor of healthy eating intentions explaining 27 percent of the variance. Behavioural importance was also a strong predictor accounting for a further 11 percent of the variance. Past behaviour (4%), outcome expectancy (4%), attitude (1%), children's health locus of control (1%) and healthy eating image (1%) were also included in the final model with low but significant effects. The final model accounted for 52 percent of the variance in healthy eating intentions.

### ***Predictors of Exercise Intentions***

A six-component model was created through the stepwise multiple regression analysis for exercise intentions. After controlling for year group and gender, behaviour-specific self-efficacy beliefs were observed as the most significant predictor accounting for 23 percent of the variance in exercise intentions. Behavioural importance followed in the model, explaining 6 percent of the variance. Past behaviour (3%) and the health behaviour of the mum (1%) were also included in the final model which accounted for 38 percent of the variance in intentions towards exercise behaviours.

### ***Predictors of Avoiding Smoking Cigarette Intentions***

Past behaviour was the strongest predictor of the intention to avoid smoking cigarettes explaining 20 percent of the variance in the model produced using the stepwise method of multiple regression. Attitude beliefs were also included in the model, accounting for 11 percent of the variance and finally behavioural importance which explained 5 percent. The overall model produced explained 36 percent of the variance in the intention to avoid smoking cigarettes.

### ***Predictors of Avoiding Drinking Alcohol Intentions***

A somewhat larger model was produced to explain the intention to avoid drinking alcohol. After controlling for age (which explained 14 percent of the variance) and gender, the model included a further six components from the study variables. Behavioural importance was the strongest predictor and explained 25 percent of the variance. Attitude was included and accounted for a further 5 percent of the variance and past behaviour an additional 3 percent. Outcome expectancy (2%), outcome evaluation (1%) and personal image (1%) were also included in the model accounting for a combined 4 percent. The final model explained 52 percent of the variance in the intentions to avoid drinking alcohol.

**Table 28: Results of stepwise multiple regression analysis for healthy eating intentions**

Predictors	R <sup>2</sup> change	Standardized beta
<b>Year group</b>		-.16**
	<b>Model 1 R<sup>2</sup></b>	<b>.02**</b>
Year group		-.16**
<b>Gender</b>		.12*
	<b>Model 2 R<sup>2</sup> change</b>	<b>.02*</b>
Year group		-.11*
Gender		.10*
<b>Behaviour-specific self-efficacy</b>		.52***
	<b>Model 3 R<sup>2</sup> change</b>	<b>.27***</b>
Year group		-.06
Gender		.09*
Behaviour-specific self-efficacy		.43***
<b>Importance</b>		.35***
	<b>Model 4 R<sup>2</sup> change</b>	<b>.11***</b>
Year group		-.06
Gender		.09
Behaviour-specific self-efficacy		.35***
Importance		.32***
<b>Past behaviour</b>		.21***
	<b>Model 5 R<sup>2</sup> change</b>	<b>.04***</b>
Year group		-.05
Gender		.09*
Behaviour-specific self-efficacy		.29***
Importance		.26***
Past behaviour		.21***
<b>Outcome expectancy</b>		.21***
	<b>Model 6 R<sup>2</sup> change</b>	<b>.04***</b>
Year group		-.07
Gender		.09*
Behaviour-specific self-efficacy		.28***
Importance		.24***
Past behaviour		.20***
Outcome expectancy		.18***
<b>Attitude</b>		.11**
	<b>Model 7 R<sup>2</sup> change</b>	<b>.01**</b>
Year group		-.03
Gender		.10*
Behaviour-specific self-efficacy		.28***
Importance		.25***
Past behaviour		.21***
Outcome expectancy		.17***
Attitude		.12**
<b>Children's health locus of control</b>		-.10*
	<b>Model 8 R<sup>2</sup> change</b>	<b>.01*</b>
Year group		-.02
Gender		.10*
Behaviour-specific self-efficacy		.28***
Importance		.24***
Past behaviour		.20***
Outcome expectancy		.17***
Attitude		.12**
Children's health locus of control		-.10*
<b>Healthy eating image</b>		.08*
	<b>Model 9 R<sup>2</sup> change</b>	<b>.01*</b>
<b>Stepwise Model</b>	<b>Total R<sup>2</sup></b>	<b>.52</b>

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

**Table 29: Results of stepwise multiple regression analysis for exercise intentions**

Predictors	R <sup>2</sup> change	Standardized beta
<b>Year group</b>		-.12*
	<b>Model 1 R<sup>2</sup></b>	<b>.02*</b>
Year group		-.12*
<b>Gender</b>		-.21***
	<b>Model 2 R<sup>2</sup> change</b>	<b>.04***</b>
Year group		-.04
Gender		-.19***
<b>Behaviour-specific self-efficacy</b>		.49***
	<b>Model 3 R<sup>2</sup> change</b>	<b>.23***</b>
Year group		-.05
Gender		-.19***
Behaviour-specific self-efficacy		.38***
<b>Importance</b>		.26***
	<b>Model 4 R<sup>2</sup> change</b>	<b>.06***</b>
Year group		-.04
Gender		-.16**
Behaviour-specific self-efficacy		.31***
Importance		.22***
<b>Past behaviour</b>		.20***
	<b>Model 5 R<sup>2</sup> change</b>	<b>.03***</b>
Year group		-.01
Gender		-.17***
Behaviour-specific self-efficacy		.30***
Importance		.22***
Outcome expectancy		.18**
<b>Mother's behaviour</b>		.11*
	<b>Model 6 R<sup>2</sup> change</b>	<b>.01*</b>
<b>Stepwise Model</b>	<b>Total R<sup>2</sup></b>	<b>.38</b>

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001**Table 30: Results of stepwise multiple regression analysis for intention to avoid smoking**

Predictors	R <sup>2</sup> change	Standardized beta
<b>Year group</b>		-.11
	<b>Model 1 R<sup>2</sup></b>	<b>.01</b>
Year group		-.11
<b>Gender</b>		-.06
	<b>Model 2 R<sup>2</sup> change</b>	<b>.00</b>
Year group		.05
Gender		-.04
<b>Past behaviour</b>		-.47***
	<b>Model 3 R<sup>2</sup> change</b>	<b>.20***</b>
Year group		.03
Gender		-.04
Past behaviour		-.41***
<b>Attitude</b>		.33***
	<b>Model 4 R<sup>2</sup> change</b>	<b>.11***</b>
Year group		.02
Gender		-.05
Past behaviour		-.36***
Attitude		.30***
<b>Importance</b>		.22***
	<b>Model 5 R<sup>2</sup> change</b>	<b>.05***</b>
<b>Stepwise Model</b>	<b>Total R<sup>2</sup></b>	<b>.36</b>

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001



**Table 31: Results of stepwise multiple regression analysis for intention to avoid alcohol**

Predictors	R <sup>2</sup> change	Standardized beta
<b>Year group</b>		-.38***
	<b>Model 1 R<sup>2</sup></b>	<b>.14***</b>
Year group		-.38***
<b>Gender</b>		.05
	<b>Model 2 R<sup>2</sup> change</b>	<b>.00</b>
Year group		-.19***
Gender		.02
<b>Importance</b>		.54***
	<b>Model 3 R<sup>2</sup> change</b>	<b>.25***</b>
Year group		-.17***
Gender		.02
Importance		.45***
<b>Attitude</b>		.24***
	<b>Model 4 R<sup>2</sup> change</b>	<b>.05***</b>
Year group		-.10
Gender		.03
Importance		.38***
Attitude		.22***
<b>Past behaviour</b>		-.22***
	<b>Model 5 R<sup>2</sup> change</b>	<b>.03***</b>
Year group		-.09
Gender		.02
Importance		.31***
Attitude		.18***
Past behaviour		-.21***
<b>Outcome expectancy</b>		.18**
	<b>Model 6 R<sup>2</sup> change</b>	<b>.02**</b>
Year group		-.09
Gender		.02
Importance		.26***
Attitude		.15**
Past behaviour		-.22***
Outcome expectancy		.14*
<b>Outcome evaluation</b>		.14*
	<b>Model 7 R<sup>2</sup> change</b>	<b>.01*</b>
Year group		-.09
Gender		.01
Importance		.26***
Attitude		.14**
Past behaviour		-.23***
Outcome expectancy		.15**
Outcome evaluation		.13*
<b>Personal image</b>		-.10*
	<b>Model 8 R<sup>2</sup> change</b>	<b>.01*</b>
<b>Stepwise Model</b>	<b>Total R<sup>2</sup></b>	<b>.52</b>

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### *Summary*

The models produced using the stepwise method in the multiple regressions represent factors that have been found to be the strongest predictors of health behaviour intentions in this study. Each model explains a higher percentage of the variance in the outcome variable compared with the MSLTc and MTPB when they were examined separately in the initial multiple regressions.

Inclusion of factors from the MSLTc in models produced for the four health behaviour intentions were limited to children's health locus of control beliefs in relation to healthy eating intentions and personal image in relation to the intentions to avoid alcohol. Generalised self-efficacy and health value were excluded from all models. From the MTPB, behavioural importance was present in all models and is therefore a significant component for any future model. Past behaviour and attitude were both included in three of the four models (with the exception of exercise intentions) and therefore also have an important contribution to the prediction of health behaviour intention. Outcome expectancy was also included in three of the four models (with the exception of smoking intentions), and seems to be an important component. Behaviour-specific self-efficacy beliefs were identified in the models as significant predictors of intentions for healthy eating and regular exercise. However, due to the exclusion of these variables discussed previously for smoking and alcohol behaviours, they were not included into the final two stepwise regressions. Parental behaviour was only entered in the model relating to exercise intentions, with the mother's health behaviour being a significant predictor. Finally, behavioural image was included in the model addressing healthy eating intentions. An overview of the final models is presented in Figure 29.

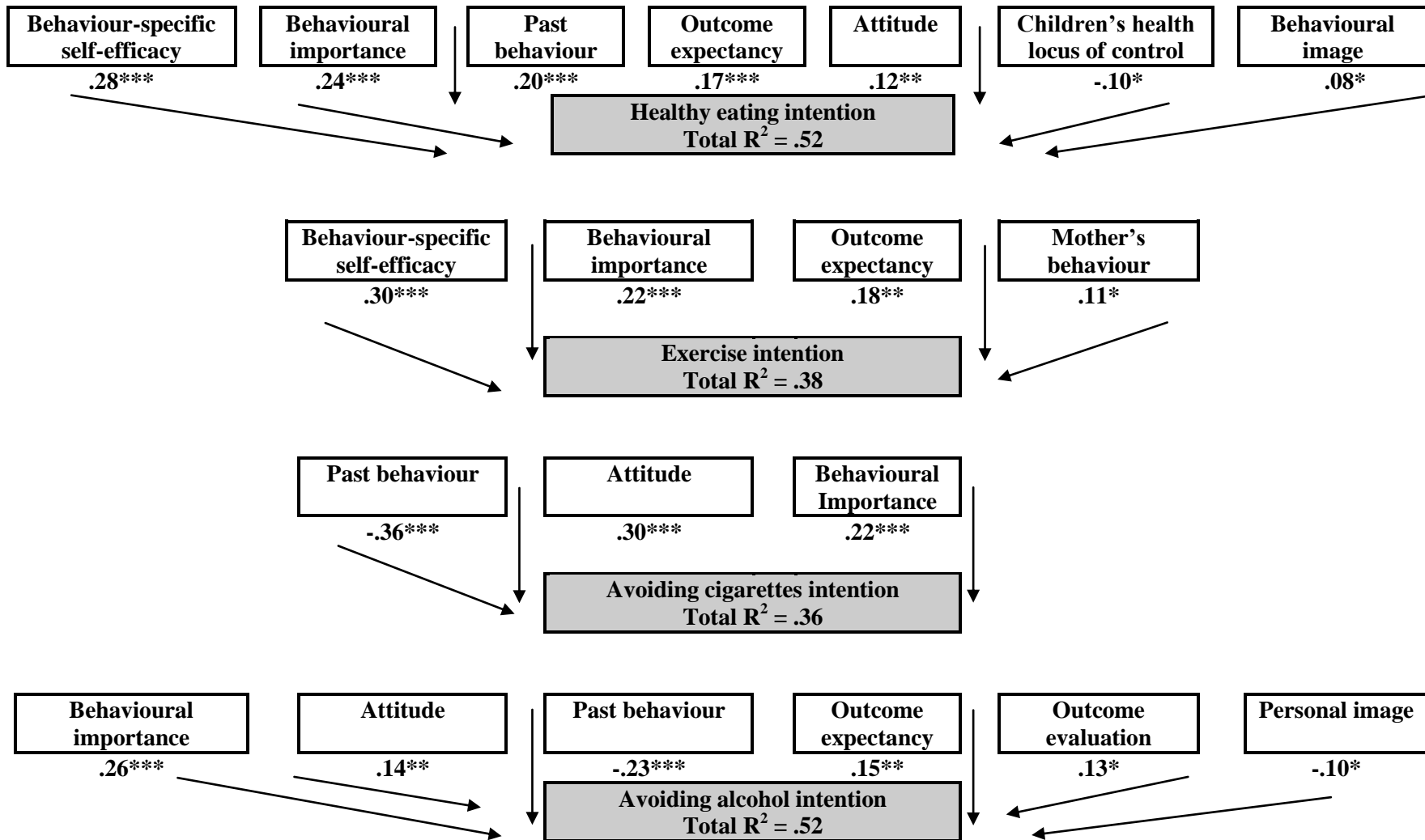


Figure 29: Predictor variables produced by stepwise regression analysis (showing standardised beta values in final models and total R<sup>2</sup>)

## 4.7 Discussion

*“Understanding individuals’ behaviour is unquestionably a formidable challenge. To a large extent, a single virus, gene, or physiological process does not determine individual behaviour. Rather, an individual’s health behaviour is reciprocally determined by myriad internal and external influences that result from the individual’s interaction with their environment”*

*(Bandura, 1986)*

The decision to perform any health behaviour is undoubtedly influenced by cognitive processes. The initiation and maintenance of health behaviour give rise to debates over whether they are learned actions or innate responses. However, it could be argued that in either case, the individual would have thoughts about the behaviour prior to performing it. This thought may be governed by perceptions of the behaviour and the perceived influence it has on health.

This study has attempted to measure a selection of components that have been shown to be involved in the decision young people make when it comes to their behavioural intention to eat healthy foods, exercise regularly, avoid smoking cigarettes and avoid drinking alcohol over a one week period. These perceptual components were examined in both boys and girls from two age groups in order to identify the strongest predictors of children’s health behaviour intention.

In light of the apparent deficiency of current empirical research in this area, the cognitive components of interest were drawn from findings based on theoretical

models developed and tested in the adult population. Two modified theories evolved following a review of the literature, referred to in the current research programme as the Modified Social Learning Theory for Children (MSLTc) and the Modified Theory of Planned Behaviour (MTPB). The MSLTc comprises of a set of generic cognitions relating to children's health locus of control, generalized self-efficacy, health value, and perceived personal image beliefs. The MTPB includes behaviour-specific perceptions of perceived image, behavioural importance, behaviour-specific self-efficacy, attitude, outcome expectancy and outcome evaluation.

#### **4.7.1 Age and Gender Differences – Hypothesis 1 and 2**

The findings for this study indicate that there are significant differences between age and to a lesser extent gender in health cognitions, health behaviour perceptions, intentions and experience. Therefore, the first two hypotheses of study 1 in this research programme are accepted and will be discussed in detail below.

##### **4.7.1.1 Modified Social Learning Theory for Children**

The combination of the two independent variables year group and gender provided no significant interaction on the factors included in the Modified Social Learning Theory for Children; children's health locus of control, generalized self-efficacy, health value, and personal image. Significant multivariate effects were, however, found for year group and gender on the MSLTc variables when analysed separately.

Consistent with previous research (Parcel & Meyer, 1978) age-related differences were identified for health locus of control beliefs with younger children reporting lower, more external beliefs compared to older children. This was expected and may be due to the younger children's reliance on others (external) such as their parents or teachers for their health outcomes. This finding may also be evidence of a transition to greater health-related independence in older children. Internal locus of control has been associated with greater knowledge of disease (Wallston et al, 1976; Tinsley, 1992). Development of health and illness concepts throughout childhood as discussed in Chapter 3, imply a transition of conceptions of the nature of health and illness with age, leading to the acquisition of a belief that health outcomes may be controllable through individual behaviour. This may also explain the increase in locus of control beliefs with age. In addition, the effect of gender on health locus of control beliefs approached the significance level ( $p=.057$ ) indicating that girls held consistently higher, more internal, health locus of control beliefs than boys, irrespective of age.

Younger children were found to place a greater value on their own health compared to older children, however reliability for this scale was low. Conclusions based on this measurement therefore, must be made with caution. There were no significant gender differences found for health value. This is inconsistent with studies in adult populations that show women to place a higher value on health than men (Felton et al, 1997). There were no differences found between the age groups for the generalized self-efficacy cognition. However, boys were found to hold significantly higher self-efficacy beliefs than girls. This suggests that boys have a greater belief

in their ability to control personal action. Boys also reported a higher (more positive) self image than girls.

#### **4.7.1.2 Health Behaviour Perceptions (MTPB), Intentions and Performance**

Separate multivariate analysis of variance were performed for the four target health behaviours to investigate possible age and gender effects in the scores of components from the Modified Theory of Planned Behaviour; image, importance, self-efficacy, attitude, outcome expectancy and outcome evaluation.

Unfortunately the question relating to behaviour-specific self-efficacy beliefs for cigarette smoking and alcohol consumption tended to be answered incorrectly, possibly as a result of participants misreading or neglecting to read the instructions for that question. Therefore to avoid misinterpretation of the data, this component was eliminated from statistical analysis.

Furthermore, differences in behavioural intentions and past performance (or experience) for all the target health behaviours were investigated in a separate single MANOVA, which revealed significant interactions between year group and gender. A discussion of these factors for each target health behaviour will follow.

#### ***Healthy Eating – Age and Gender Differences***

Perceptions of healthy eating revealed a number of significant differences, with an interaction of year group and age on the multiple dependant variables. Findings revealed that the perceived importance of healthy eating increased with age for girls,

however, decreased in age for boys. This was also true for attitudes towards healthy eating, with the attitude of girls improving with age, and the attitude of boys decreasing with age. Further investigation also found that the younger children in year 7 possessed a more positive image of people who maintain healthy eating compared to older children in year 10. These findings are both interesting and concerning as the cognitions investigated in previous research (attitude and image) have been found to be significant predictors of behavioural intention and subsequent behaviour performance (Gibbons & Gerrard, 1995; Dzewaltowski et al, 1990; McEachan et al, 2005). The fact that they are increasing in age for girls is welcomed as this may in turn have a greater effect of female behavioural intention, however the decline in these cognitions in boys may in turn lead to a decline in behavioural intention.

Investigating differences between year group and gender for the intention to eat healthy foods, data revealed that this intention is similar amongst boys and girls, and relatively high in year 7. However, healthy eating intentions differ significantly by year 10 with the intentions of girls staying quite stable while boys' intentions show a substantial decline. This suggests the transition in age does not affect the healthy eating intentions of girls, whilst boys' intention to eat well reduces with age. This finding supports the suggestions made above. Boys' perceptions of importance and attitudes towards healthy eating were also identified as decreasing with age, and it could be argued that these components are related. Separate effects of age and gender were also found. Younger children and girls held higher intentions to maintain a healthy diet compared to older children and boys. Healthy eating



behaviours over the past week were not significantly different between the age groups and gender.

### ***Regular Exercise – Age and Gender Differences***

No significant interaction was found between year group and gender on the multiple dependant variables in the MTPB for exercise behaviours. Gender also failed to produce a significant main effect. Significant differences were, however, found between year groups. The perceived image of a young physically active individual significantly decreased from year group 7 to year group 10 suggesting the younger age group hold a more positive image of people who exercise on a regular basis. The self-efficacy beliefs in the ability to exercise regularly were also much higher in younger children compared to older children. As discussed in Chapter 3, perceived self-efficacy has frequently been reported as a strong predictor for health behaviours and intentions towards exercise (Cavill et al, 2001; Weiss, Wiese & Klint, 1989; Dzewaltowski et al, 1990). Findings reported here suggest that cognitions salient to health-related behavioural intentions, such as self-efficacy, are decreasing with age.

A significant interaction was found between year group and gender in exercise behaviours over the week prior to data collection. Like healthy eating behaviours, reports of physical activity were similar between the younger boys and girls. However, they differed significantly between genders in year 10, with older boys' exercise continuing at a similar level as the younger boys, while older girls' self-reported exercise plummeted. This data supports findings reported in the literature

(Kimm et al, 2005; Misra & Aguillon, 2001; Todd et al, 2000; Kurtz & Thornes, 2000) that girls' exercise levels decrease dramatically with age.

Reporting on behavioural intention, girls were again found to have significantly lower intentions to engage in physical activity in the week following data collection when compared to boys. Exercise intentions were not, however, significantly influenced by age.

#### *Avoiding Smoking Cigarettes – Age and Gender Differences*

Gender differences were again not found within the health behaviour perceptions of the MTPB for avoiding smoking a cigarette. Significant differences were, however, found between year groups. The main effect of this was attributed to the difference in outcome expectancy beliefs, with younger children holding a higher expectation that if they avoided smoking cigarettes it would be beneficial to their health compared to that of older children.

The expectation of a behavioural outcome appears in several guises in previous research. It appears in the Theory of Planned Behaviour as a factor of attitude termed behavioural beliefs, and is described as action-outcome expectancies in Self-Efficacy Theory. Outcome expectancies are further included within the coping appraisal element of the Protection Motivation Theory (Rogers, 1975) labelled response efficacy (this model will be discussed in more detail in the next chapter). Irrespective of the theory they are included in, outcome expectancies have been repeatedly identified as significant predictors of (or part of a component such as

attitude that can significantly predict) behavioural intention (McEachan et al, 2005; Luszczynska et al, 2005; Schwarzer & Fuchs, 1995; Floyd, Prentice-Dunn & Rogers, 2000; Milne, Sheeran & Orbell, 2000). Therefore, the fact that this perception towards the health behaviour is decreasing with age (regardless of gender) is again a possible area of concern for health professionals.

Both boys and girls in year 7 were found to hold high intentions towards the avoidance of smoking cigarettes, and with age this intention decreased. Although this decline is noteworthy, it was not a significant reduction. Gender differences were however significant, with boys intending to avoid smoking cigarettes at a significantly higher level than girls irrespective of age. The number of children who had experienced smoking cigarettes significantly increased from year 7 to year 10. This supports previous findings in the literature that indicates that smoking behaviours increase with age (Galanti et al, 2001; Kurtz & Thornes, 2000), especially in girls (Nahit et al, 2003; Faucher, 2003).

### ***Avoiding Alcohol Consumption – Age and Gender Differences***

Differences between year groups were highly significant for alcohol-related perceptions, with main effects attributed to each dependant variable. Gender differences were not however found. Findings revealed younger children held a significantly lower (more negative) image of a young person who drinks alcohol to that of the older children. The importance attributed to avoiding drinking alcohol and attitudes towards such avoidance behaviour were also significantly higher in the younger children. Additionally, the expectation that avoiding alcohol would be beneficial to health was significantly higher in the year 7 pupils, along with the

evaluation that this outcome would be good. Again data suggests that it is the younger children who express more 'health-enhancing' perceptions, showing less idolization of under-age drinkers, stronger attitudes towards avoiding alcohol consumption and a greater belief in the importance and expectancy that avoiding the behaviour will be beneficial to health.

The intention to avoid drinking alcohol was significantly higher in the younger children, intentions shown to decrease with age in the older children. There are a number of components reported above that are affected by age, therefore their ability to predict intentions to avoid drinking alcohol may be influenced to some extent by the child's year group. Finally, consistent with previous research (Kurtz & Thornes, 2000) the younger children also had significantly less experience of drinking alcohol compared to the older children.

### *Summary*

The findings discussed in this chapter to a large extent support the first and second hypotheses of study 1 that state there would be significant differences between age and gender for health behaviour perceptions, intentions and experience. It could be argued that the decline in beliefs of the importance and expected outcome of the target health behaviours towards health status may be a transition towards a greater level of unrealistic optimism that has been found in young people (Greening et al, 2005; Gochman, 1987). The decline in behaviour-specific self-efficacy beliefs could be attributed to a multitude of factors that may be related to perceived barriers (such as time or peer pressure). It is beyond the scope of this research programme to investigate possible causes of the differences between younger and older children

and to a lesser extent boys and girls in their health behaviour perceptions and cognitions. There is, therefore, the need to clarify the factors and mechanisms contributing to these findings in future research. With evidence that younger children are instilled with a higher level of cognitions and perceptions salient to health-enhancing behaviours it seems from the age of 12 years there is a need for health professionals to attempt to maintain these beliefs through to adolescence and young adult-hood in an attempt to promote and maintain good health.

#### **4.7.2 Predicting Health Behaviour Intentions – Hypotheses 3, 4, 5 and 6**

The theoretical framework for the Modified Social Learning Theory (Wallston, 1992) assumes that the presence of an internal health locus of control, high self-efficacy beliefs and a high health value are all needed for the formation of a behavioural intention. Although the theory was proposed in 1992 by Wallston, empirical evidence in support of the theory has not been found. The current research programme aimed to investigate the model's ability to predict health behaviour intentions adding a further component of perceived image to the proposed Modified Social Learning Theory for Children (MSLTc). This addition was based on the assumption that for a younger generation, in addition to possessing beliefs in the controllability of health outcomes and health actions, and a high value placed on health, their perceived self-image may also be important.

The Modified Theory of Planned Behaviour makes the assumption that the perceived image of a typical person performing a health behaviour, the perceived importance of the health behaviour on health status, self-efficacy beliefs specific to the health behaviour, and the attitudes, outcome expectancies and evaluations of the

performance of the health behaviour all contribute to the prediction of an intention to perform a health behaviour.

Moreover, the current research programme assumes that behavioural intentions are further influenced by past behaviour and perceived parental health behaviours. The predictive strength of these two models, past behaviour experience and observed parental behaviour performance on behavioural intentions of the target health behaviours will be discussed in detail below.

#### **4.7.2.1 The Modified Social Learning Theory for Children (MSLTc) Model**

The MSLTc was found to be a significant, but weak, model in predicting healthy eating and exercise intentions. When the effect of year group and gender were held constant, the MSLTc model explained 7 percent of the variance for healthy eating intentions and 6 percent of the variance for exercise intentions. With regards to healthy eating intentions, generalised self-efficacy beliefs were the strongest predictors, followed by perceived personal image. Children's health locus of control increased the variance by 2 percent and health value had no significant effect. Exercise behaviour intentions were also best explained by generalized self-efficacy beliefs and perceived personal image, which both explained 3 percent of the variance. No evidence was found for the effects of children's health locus of control or health value on intentions to exercise. Components from the model explained only 3 percent of the variance for intentions towards avoiding to smoke a cigarette, and failed to show any effect on intentions towards drinking alcohol. The intention to avoid smoking cigarettes was best explained by children's health locus of control

and health value. No effects were observed by generalized self-efficacy beliefs or personal image.

Findings drawn from this study for the MSLTc are therefore mixed. This reflects empirical evidence identified in Chapter 3 from previous literature. Self-efficacy has been found to be the strongest predictor of the two health-enhancing behavioural intentions (healthy eating and exercise), supporting previous evidence (Shannon et al, 1990; Schwarzer & Fuchs, 1995; Luszczynska et al, 2005; Weiss et al, 1989; Dziewaltowski et al, 1990). However, beliefs in individual generalized self-efficacy failed to demonstrate any affect on intentions towards avoiding the health-impairing behaviours. The author has been unsuccessful in locating previous literature investigating the influence of perceived self-image. However, the apparent predictive significance of the cognitive factor, which was based on work examining perceived prototype image (Gibbons & Gerrard, 1995), suggests it is a cognition worthy of future investigation. Furthermore, perceived self-image may support concepts such as self-identity (Eagly & Chaiken, 1993) as a potential predictor of health behaviour. The interaction between health locus of control and health value supports previous findings that indicate their combined ability to predict intentions to avoid smoking cigarettes (Nemcek, 1990; Shelton et al, 1992; Weiss & Larsen, 1990). However, their non-significant effect on healthy eating and exercise intentions is also reflected in the literature, with previous studies reporting similar results (Wurtele et al, 1985).

#### **4.7.2.2 The Modified Theory of Planned Behaviour Model**

The Modified Theory of Planned Behaviour (MTPB), controlling for age and gender, explained 48 percent of the variance in healthy eating intentions, 36 percent of the variance in exercise intentions, 27 percent of the variance in the intention to avoid smoking cigarettes and explained 48 percent of the variance in alcohol avoidance intentions.

Overall, behavioural importance was found to be the strongest predictor of all the target health behaviour intentions of interest in this study, explaining 19 percent of the variance for healthy eating intentions, 14 percent of the variance for exercise intentions, 11 percent of the variance for non-smoking intentions and 23 percent of the variance for non-drinking intentions. Behaviour-specific self-efficacy beliefs were also strong predictors for health enhancing intentions of healthy eating ( $R^2$  change = .16) and regular exercise ( $R^2$  change = .12), although they were not examined for the intentions towards avoiding the health-impairing behaviours. This is a limitation of the current study considering the strength of the association between behaviour-specific self-efficacy and health behaviour intentions. Perceived image contributed to a lesser extent to the overall percent of variance, with a small significant effect from outcome expectancy and outcome evaluation. Attitude was found to be a strong predictor in intentions to avoid smoking cigarettes ( $R^2$  change = .10), and to a lesser extent intentions to avoid alcohol consumption ( $R^2$  change = .05). However the predictive value of attitude was weaker in healthy eating and exercise intentions. Year group was a strong predictor of alcohol related intentions explaining 14 percent of the variance, and contributed to a small amount of the variance in each model.



#### **4.7.2.3 Previous Experience**

Previous experience with behaviour has not been included in any previous assessments of the cognition models reported in this thesis, despite reports that it is a significant predictor for future behavioural intention (Hagger et al, 2002; Norman et al, 2005; Schwarzer & Fuchs, 1995).

Past behaviour was observed to be a significant predictor for all of the behavioural intentions accounting for between 13 to 20 percent of the variance. After controlling for year group and gender, past behaviour explained 19 percent of the variance in healthy eating intentions, 16 percent of the variance in intentions to exercise, 20 percent of the variance in the non-smoking intentions and 13 percent of the variance in the intention to avoid consuming alcohol. Previous behavioural experience and performance are therefore significant predictors of future behavioural intention in this sample.

#### **4.7. 2.4 Influence of Parental Health Behaviours**

The influence of parental health behaviours on the health behaviours of their children was minimal with mothers' health behaviours providing the strongest effects. Again controlling for year group and gender mothers' health behaviour accounted for 3 percent of the variance of healthy eating intentions, 6 percent of the variance of exercise intentions, and 2 percent of the variance of avoiding the consumption of alcohol. Maternal behaviour accounted for a further 1 percent of the variance in intentions to avoid cigarettes, however, this was not a significant effect.

Paternal behaviour was found to explain 3 percent of the variance for healthy eating intentions. An additional 1 percent of the variance of the intention to avoid alcohol was explained by fathers' behaviour. However, this was not a significant change, with no significant effect found on exercise and smoking related intentions. Post hoc analyses showed that the proportion of the variance explained by these variables was increased by excluding age and gender. However, the significant results reported earlier that identified age and gender differences in the study variables suggest that these factors should be controlled for.

#### **4.7.3 Proposition of a New Model – Theory of Health Behaviour Perceptions**

One of the objectives of this research programme was to test components of established health behaviour theories in an attempt to construct a model that can successfully predict health behaviour intentions of children.

The final analysis of this study therefore examined all components under investigation together in an attempt to construct a model containing the strongest predictors of behavioural intention for each of the target health behaviours. Each model explained a higher percentage of the variance in the outcome variable (intention) compared with the MSLTc, the MTPB, past experience and parental behaviours examined separately.

Behavioural importance from the MTPB was present in all models explaining between 22 to 26 percent of the variance in behavioural intentions and is, therefore, a significant component for a final model. Past behaviour and attitude were both included in three of the four models (with the exception of that for exercise

intentions) explaining between 20 to 36 percent and 12 to 30 percent of the variance of behavioural intentions respectively and, therefore, also have an important contribution to the prediction of health behaviour intentions. This is consistent with previous findings (Hagger et al, 2002; Norman et al, 2005; Schwarzer & Fuchs, 1995). Outcome expectancy was also included in three of the four models (with the exception of that for non-smoking intentions) explaining between 15 to 18 percent of the variance in behavioural intentions, and seems also to be an important component, again supporting empirical evidence of its success in predicting health behaviour intentions (McEachan et al, 2005; Schwarzer & Fuchs, 1995; Floyd et al, 2000; Milne et al, 2000). Behaviour-specific self-efficacy beliefs were entered into the analyses of healthy eating and exercise and were found to be significant predictors of behavioural intention explaining 28 percent of the variance in healthy eating intentions and 30 percent of the variance in intentions to exercise. Due to the non-inclusion into final data analysis of this perception for the two avoidance behaviours, this is one component that can only be discussed for the health promotive behaviours. However, the results warrant an inclusion of behaviour-specific self-efficacy in the final model.

Parental behaviour was only included in the model relating to exercise intentions, with the mother's health behaviour being a significant predictor. This does not reflect the volume of empirical evidence that suggests a positive relationship between parental and child health behaviours (Chassin et al, 2005; Green et al, 1991; Li et al, 2002). However, effects of parental modelling have provided mixed results. Studies that have reported a positive effect on children's health behaviours such as exercise and avoiding smoking are thought to be partly due to the parents instilling

perceptions of competence in their children (McElroy, 2002) and their disapproval of the behaviour (Sargent & Dalton, 2001). This is perhaps an area worthy of future research, incorporating parental attitudes and beliefs.

Finally, behavioural image was included into the model addressing healthy eating intentions and may be a component that should be considered for inclusion in a future model. Inclusion of factors from the MSLTc in models produced for the four health behaviour intentions were limited to children's health locus of control in relation to healthy eating intentions and personal image in relation to the intentions to avoid alcohol. Generalised self-efficacy beliefs and health value were excluded from all models.

#### **4.7.3.1 Final Models**

The final model for healthy eating intentions accounted for 52 percent of the variance. This includes the influence of year group (2%) and gender (2%). The final model relating to exercise explained 38 percent of the variance in intentions towards exercise behaviours with 2 percent attributed to year group and a further 4 percent explained by gender. The overall model produced for non-smoking intentions explained 36 percent of the variance with only a 1 percent change by year group. The final model explaining intentions to avoid alcohol contributed to 52 percent of the variance. This model was however substantially affected by year group, which explained 14 percent of the variance. However, with the removal of the influence of age, it still explained 38 percent of the variance in non-drinking intentions.

From these findings a new model of health behaviour perceptions is proposed that suggests five components that together have been found to be the most significant predictors of children's health behaviour intentions. These five components are behavioural importance, past behaviour, behaviour-specific self-efficacy, attitude and outcome expectancies, (Figure 30). Although age and gender have been shown to mediate these associations, this model is proposed to be used across all age groups as, once the two variables are controlled for, these components still show significant predictive strength. This is in line with existing models that are used for a generic adult population, regardless of individual differences between age and gender.



**Figure 30: Proposed model of Health Behaviour Perceptions**

A measurement and examination of behavioural importance has not been found in the empirical literature and is therefore an important factor to be considered in future research. Past behaviour, although not a cognitive component as such, is thought to influence cognitions such as outcome expectancies and self-efficacy as a result of personal mastery (or lack of) (Bandura, 1986). Behaviour-specific self-efficacy, attitudes and outcome expectancies are frequently reported in the literature within Self-Efficacy Theory and the Theory of Planned Behaviour as significant predictors

of behavioural intentions as discussed above, therefore their inclusion into the final model supports previous findings.

This proposed model does not include four of the factors (children's health locus of control, behavioural image, outcome evaluation and perceived self-image) found in the current research programme to be significant predictors of at least one of the health behaviour intentions. This is due to the lack of consistency of predictive strength in the findings and their lower levels of R squared change than the ones included in the above model. They may, however, be components worthy of future research in addition to the components proposed within the new model of health behaviour perceptions to test their predictive strength in different populations.

#### **4.7.4 Summary and Limitations of Study 1**

Study 1 of the current research programme provides evidence of predictors of young people's intentions to eat healthy foods, take regular exercise, avoid smoking cigarettes and avoid drinking alcohol over a one week period. Although several age and gender differences were observed, they did not have a substantial influence on the overall predictive strength of the final models generated by stepwise hierarchical regressions. This is with the exception of year group on alcohol-related intentions. A final model is now proposed consisting of components that measure behavioural importance, past behaviour, behaviour-specific self-efficacy beliefs, attitudes and outcome expectancies. The significance of these components supports previous research from both studies with children and work in the adult population.

The conceptual and methodological approach adopted in this study was described earlier on in this chapter. Nonetheless, several limitations of the study need to be acknowledged. The first issue is the choice of methodology. The study adopted a cross-sectional design and utilized self-report measures. This type of design, although widely used in empirical research, is often subject to criticism (Manfredo & Shelby, 1989). The causality of research findings in relation to gender and age related differences are therefore questionable due to the use of different samples within these categories. The use of self-report data may further limit the conclusions to be drawn due to participant recall and accuracy. This research programme has attempted to minimize the limitation of recall by restricting the questions to a relatively short period of time (i.e. think back over the last week/ two weeks). The time line between the collection of data relating to behavioural intention, and actual behaviour performance was one week. This time-line adopted was also used by previous researchers in their work on predictors of exercise behaviour (Norman, Boer & Seydel, 2005). The assurance of anonymity is hoped to minimise questions answered inaccurately based on previous research that suggests if anonymity is guaranteed fully, valid responses of socially proscribed behaviours are likely even among young adolescents providing self-reports of drug use (Murray & Perry, 1987).

A further limitation perhaps to (rather than of) the current research programme was the lack of current relevant empirical research in the area of children's health perceptions and health behaviours. There are several studies, however, reported in this research programme that were published after the date methodological decisions had been made regarding the current study. Woods et al's work investigating

children's understanding of passive smoking was released in 2005 for example. Similarly, Greening et al's findings of low negative health experience and low perceived health threat was published in 2005. Other work investigating how children perceive behaviours relevant to health status are dated, with much work conducted in the 1980's such as that of Bibace and Walsh (1980), Kister and Patterson, (1980) and Brewster (1982).

There is a lack of agreed definitions of key concepts investigated in this research programme. It seemed, therefore, to be appropriate to link the theoretical frameworks such as those included in the current research programme. However, literature incorporating the previously discussed theoretical models into the realms of children's health perceptions and health behaviours are limited. This again created a limitation for the current research programme that was forced to explore the assumptions of these models in an adult population. Of those studies cited using these models in a child population, it is noted that these are dated, such as work investigating health locus of control (Parcel et al, 1980; Wallston et al, 1976; Eiser et al, 1989) and perceived self-efficacy (Gochman, 1987; De Vries, 1989; Weiss et al, 1989; Shannon et al, 1990; Kok et al, 1992). It is hoped that publications that follow from the current research programme can build on the recent work published in the area (such as, Greening et al, 2005 and Lohaus et al, 2004) and possibly create a foundation for future research investigating social cognitive factors specifically relevant for the child population. This would be salient research within the health care system to date considering the increasing levels of childhood obesity and links between health behaviours in childhood, obesity and adult health problems such as coronary heart disease and cancer.



The deficiency of empirical research incorporating social cognition models in the child population created further limitations that ultimately led to the development of an instrument specifically designed to collect information relevant to such models in this study. Although it could be argued that this is one of the original contributions of this research programme, it is not without limitations. The exclusion of behaviour-specific self-efficacy questions relating to smoking and alcohol use is one example of the limitations of using a newly developed instrument. It is the conclusion of this research programme that this question in the Health Perceptions Questionnaire was misinterpreted and therefore answered incorrectly. If the HPQ were to be used again in the future, the format of these questions would need to be addressed with perhaps clearer instructions attached. The reliability of the questionnaire as a whole is also questionable, as for this research programme the reliability of each section was tested as opposed to the HPQ as a single instrument. This was due to the variety in questions and response formats that reflected the standardized tools each section was drawn from. It may therefore be more viable for the HPQ to be referred to as a 'package' of instruments, each scoring relatively high in the current research programme for internal reliability, that together measure the main theoretical components of interest in this research programme.

A subsequent question those addressed in study 1 that explored significant predictor variables of children's health behaviour intentions is that of the possibility of adapting or enhancing these intentions and subsequent behaviours. Study 2 therefore aims to investigate if a theoretically driven intervention workshop can successfully enhance behavioural intentions and health behaviours compared to those previously given in study 1.

## Chapter 5: Study 2 – Literature Review

*“Successful interventions do not occur by chance; detailed planning is a must!”*

*(McKenzie, 2005)*

Gaining an understanding of children’s perceptions towards health behaviours and their influence on health status is an important task for many reasons. The first is to gain insight into how children actually think and feel, rather than what society and health professionals believe they should feel. Children are considered to be a healthy population. This may be one reason why their health behaviour perceptions have not yet been empirically investigated. The first study has therefore generated some interesting findings for the field of health psychology and public health.

As discussed in previous chapters, children are now beginning to learn and experiment with a number of health behaviours at an early age, and the salient concept of health promotion is an attempt to minimise the number of those at risk. It is, therefore, not only important to understand factors that influence and predict children’s health behaviour, but also to investigate strategies that can be employed to enhance such perceptions, and ultimately motivate and maintain health-enhancing behaviour.

### **5.1 Health Promotion and Public Health**

Concern about new ‘pandemics’ of obesity (Manson, Skerrett, Greenlan & VanItallie, 2004) and binge drinking (Department of Health, 2004) have pushed

public health up the policy agenda in recent years. Public health has traditionally been associated with public health medicine and an effort to prevent disease. However, changes in the population, the epidemiology of diseases and health care structure have expanded the role of public health. This epidemiological and structural transition over the centuries has led to the term 'New Public Health', used to reflect a broader, social view of the discipline (Naidoo & Wills, 2005; DoH, 2004). Various factors have acted as a driving force in this process including public health research, government policy, public expectations and professional expertise.

There has been a shift of the main causes of mortality and morbidity within the Western population, from infectious diseases in the seventeenth century, to chronic illnesses where lifestyle plays a major role in modern times. Between the 17th and 19th centuries, public health was essentially concerned with eliminating diseases such as the bubonic plague, smallpox and cholera (Snow, 2002). With industrialisation and rapid developments in towns and cities during the 19th century, the work of public health became focused on environmental issues, such as providing clean water supplies, the disposal of waste and improved housing conditions. It was acknowledged that to prevent diseases the responsibility must widen from the doctor treating the victim, to the government playing an active role in improving the living environment. The 20th century saw an epidemiological shift of the main causes of mortality and morbidity from infectious diseases to chronic illnesses. These illnesses, discussed in Chapter 3, include coronary heart disease, stroke, cancers, and respiratory conditions.

The shift to the concept of new public health sees the importance of addressing the ‘root causes’ of ill health in the physical, social and economic environment (DoH, 1999). Towards the end of the 20<sup>th</sup> century public health was defined as “*The science and art of preventing disease, prolonging life and promoting health through the organised efforts of society...*” (Acheson, 1988). In more recent times, priorities now lie with having an understanding of the population’s perspective of health and disease, recognising the role of the government in tackling underlying socio-economic causes of ill health, working in partnership with local communities to make sure they are involved in service development and planning, and working in partnership with other agencies and the public to develop health improvement strategies and ensure they work in a multi-disciplinary way (Naidoo & Wills, 2005). As health promotion has become an internal part of public health practice, its goals have been defined by primary and secondary prevention efforts of disease and health-compromising conditions. Primary prevention efforts are designed to prevent the onset of a disease by reducing the impact of the known risk factors. Secondary prevention efforts are intended to enhance early detection of disease, for example Pap tests that are widely used to detect pre-cancerous cells in cervical smear tests. Primary prevention efforts are, therefore, of focal interest of the current research programme, examining known risk factors in young people and developing a theoretically-led intervention package to promote health behaviours.

Applying medical models to health has been referred to as a ‘downstream’ approach, where medical intervention pulls ‘drowning individuals from the rivers’ currents (Crosby, Salazar, DiClemente & Wingood, 2005). In contrast, health promotion is viewed as an ‘upstream’ approach, intervening early to reduce the risk of people

falling ‘into dangerous rivers in the first place’ (Crosby et al, 2005). The protective nature of health promotion strategies may therefore enhance the containment of medical costs, providing a favorable cost-effective direction for the discipline of new public health. However, unlike the medical model of public health that shows a clear rate of people ‘cured’ through treatments, health promotion initiatives are far less tangible.

In sum, the field of Health Promotion has been described by Rawson (2002) as a ‘borrowed discipline’, importing theories from other fields such as psychology, sociology and epidemiology. There are many theoretical constructs that can be applied to questions such as; What influences health decisions and behaviour? How does the environment influence health? How are messages communicated and can they be targeted to particular groups? Using the theoretical constructs of social cognition models from the discipline of psychology, these are a number of underlying questions to be addressed throughout this current research programme. These will be discussed below.

## **5.2 Public Health Campaigns**

Health promotion in the UK predominately focuses on mass media campaigns conveying messages through media resources such as the television, videos, leaflets and posters. For most health professionals, such communication conveys messages about reducing risk and the effective use of services. Although all too often, those responsible for public health campaigns respond to public health needs by producing a brochure or poster with the belief that the information within them will induce behaviour change. Such a belief is based on the assumption that the recipients of

such information are rational thinkers when it comes to their health, and would change their behaviour once informed of the risk (Slater, 2005). Often these campaigns draw on communication and attitude theories where the concepts of threat and fear are used. The underlying principle of these campaigns is the belief that the fear they induce will motivate behaviour change. However, empirical evidence available on the efficacy of this approach is mixed. Individuals do not necessarily respond rationally to avoid the threat linked to so called ‘fear-appeals’, and will often disassociate themselves from the message (Franzkowak, 1987; Soames-Job, 1988). The task of changing an individuals’ behaviour to a healthier alternative is notoriously problematic. To simply expect individuals to change behaviour when presented with information or a threat of disease or illness is naïve.

### **5.2.1 Attitude and Communication Theories**

There are several models of communication that all follow a similar linear process in an attempt to influence public attitudes. McGuire (1996) expanded on the Yale-Hovland model (1953) and suggests that successful communication entails five factors associated with the source of the communication, the message, the channel of communication, receiver characteristics and the destination. Source factors include the characteristics of the sender such as their likeability and credibility, the message factor refers to the style and appeal of the message, the channel concerns how the message is presented (i.e. leaflets, radio, television). The receiver element takes into account the cultural beliefs, socio economic status, age and gender, and the destination refers to the desired impact (for example cognitive or behavioural changes).

Source characteristics of those providing information through the media have been found to have an impact on the effectiveness of the message, with enhanced recall reported to be related to similarity, credibility and attractiveness (DeBono & Telesca, 1990). If a source is perceived as trustworthy and competent individuals are less resistant to the message and will accept it more readily (Grewal, Gotlieb & Marmorstein, 1994). Government approved media campaigns utilise these effects in their use of sources, such as famous sports personalities and musicians in health-enhancing initiatives. In a scheme to assist individuals in making small changes in their lifestyles Unilever introduced a range of products to support their mission statement to “Add vitality to life...” (Unilever, 2006). Through the channels of mass media the popular singer Lulu introduced the ‘Flora Pro.activ Challenge’. Equipped with the knowledge that heart disease is a major cause of death in women over 55 years of age and the ageing population of the UK to date Unilever reveal the marketing objective of this campaign was to build appreciation of Flora Pro.activ amongst women over this age ([www.lulusproactivchallenge.co.uk](http://www.lulusproactivchallenge.co.uk)). Lulu is an attractive and credible personality to the target audience and is presented in the advertisement with news of high cholesterol. Through additional advertisements a simple and successful way to reduce cholesterol is communicated.

Public health messages are conveyed via a number of channels and vary in terms of their content. The government’s NHS smoking cessation campaign ([www.givingupsmoking.co.uk](http://www.givingupsmoking.co.uk)) is a good example of the use of varying sources, message content and channels. The campaign conveys messages on cigarette boxes warning of the damage to individual health, television advertisements presenting scenarios of individuals dying of lung cancer and the attendant distress caused to

families, billboards emphasising the risk of passive smoking with the words ‘If you smoke I smoke’ written in child-like handwriting and pages in magazines of attractive young individuals that at closer inspection have indicative signs of smoking (such as yellow teeth). Overall, the media campaign appears to have had an effect on smoking cessation efforts, with a marked increase in the number of smokers contacting the service (Foulds, 2000). The message content of such a campaign is varied and often integrates the use of emotions such as fear. However, evidence of the effectiveness of such interventions is mixed and will be discussed further with specific reference to so called ‘fear appeals’ below.

Evaluation of community campaigns is, however, problematic as there is a lack of control over potentially confounding factors that may influence behaviour change. Furthermore, it is difficult to gain immediate feedback or modify the message to respond to the needs and individual differences of the recipients. One-way communication has major implications. Hence, research is predominantly ‘laboratory-based’ (i.e. in schools and clinics) where there is a greater ability to control interventions.

#### **5.2.1.1 Protection Motivation Theory**

A common theory used in the investigation of the use of fear-arousing messages within health promotion is the Protection Motivation Theory (PMT), developed by Rogers (1975). Combining elements of social learning theory and the Health Belief Model, PMT attempts to explain how fear-arousing health communications are processed and subsequently acted upon. The model focuses on two cognitive factors; 1) threat appraisal, which is a function of both perceived susceptibility to



illness and its severity, and 2) coping appraisal, which is a function of both response efficacy and self-efficacy beliefs. The outcome of these appraisals is an intention to behave in either an adaptive or maladaptive manner, the strength of which reflects the degree of motivation to protect health that in turn is thought to predict behaviour. An individual is, therefore, more likely to change their behaviour in response to a fear-arousing health message if they believe; (a) they are susceptible to disease, (b) the disease will have severe consequences, (c) they perceive a link between protective behaviours and reduced risk for disease, and (d) consider themselves capable of engaging in them, (Bennett & Murphy, 1997).

Findings from meta-analyses examining the use of the PMT (Floyd, Prentice-Dunn & Rogers, 2000; Milne, Sheeran & Orbell, 2000) show that components of the coping appraisal (response efficacy and self-efficacy beliefs) are stronger predictors of the motivation to protect health than components of threat appraisals (perceived susceptibility and severity). Plotnikoff and Higginbotham (2002) further found that intentions to exercise were best explained by self-efficacy beliefs, with weak effects reported for the elements within the threat appraisal dimension of the model. Norman, Boer and Seydel (2005) further report the highly predictive power of self-efficacy, emerging in their study of PMT, as the only significant predictor of exercise intentions explaining 53 percent of the variance. However, when past exercise behaviour was added to the model effects of self-efficacy were diminished resulting in past behaviour becoming the sole significant predictor of exercise intention explaining 59 percent of the variance. Intention and past behaviour were also reported to be significant predictors of exercise behaviour at one-week follow-up (Norman et al, 2005). The study concludes that attempts to increase exercise

behaviours should concentrate on enhancing self-efficacy beliefs as this enhancement is likely to lead to stronger intentions that have been found to predict exercise behaviour.

The relationship between fear appeals and health behaviour change in general have resulted in minimal change. The assumption that the recipients of fear arousing messages are rational thinkers when it comes to their health is an obvious limitation of theoretical constructs incorporating the emotional element of fear. Under conditions of low levels of perceived vulnerability and high self-efficacy individuals may be motivated to change health behaviour. However, fear is associated with the prediction of a negative outcome (Walker, 2001). This has led to resistance towards messages targeting adolescent risk taking behaviours (Franzkowak, 1987) and denial of the threat (Soames-Job, 1988). The use of such strategies in intervention packages aimed at enhancing health-promoting behaviours may therefore be counter-productive. Theories on behaviour change suggest people progress through stages that involve an individual contemplating a new behaviour and preparing for change. Such models set theoretical assumptions about the change process which individuals are thought to go through before a new behaviour is initiated and maintained (Prochaska & DiClemente, 1983). Research suggests a small amount of threat may initiate the contemplation of possible benefits of health-enhancing actions (Schwarzer, 1992).

#### **5.2.1.2 Message Framing – Prospect Theory**

Is a glass ‘half empty or half full’? Message framing has been documented as having an important influence on changing perceptions in relation to health

behaviour (Rothman, Salovey, Antone, Keough & Martin, 1993) and is inspired by Kahneman and Tversky's Prospect Theory (1979, 1982), which states the way in which a message is framed can influence its persuasiveness and effectiveness. Health-relevant communications can be framed in terms of the benefits (gains) or costs (losses) associated with a particular behaviour. Research has found the framing of such persuasive messages can significantly influence health-related decision making (Rothman & Salovey, 1997). However, the salient function of a framed message can depend on the type of behaviour being communicated. A distinction has been reported between prevention-oriented and detection-oriented behaviours. A prevention-oriented behaviour aims to maintain health status and prevent possible health problems. A detection-oriented behaviour aims to find or detect potential health problems at an early stage. Past research suggest that positive framed messages are more effective for prevention-oriented behaviours, while negative framed messages show greater effectiveness for detection-oriented behaviours (Detweiler, Bedell, Salovey, Pronin & Rothman, 1999; Rothman & Salovey, 1997; Rothman et al, 1993). The adoption of prevention behaviour can be conceived as a relatively safe behavioural alternative that maintains an individuals health status. Research has found that gain-framed information is the most successful approach when promoting prevention-oriented health behaviours (Rothman & Salovey, 1997; Rothman et al, 1993; Tversky & Kahneman, 1981)

The influence of message framing has been explored in several studies on prevention behaviours such as exercise, infant car seat use, and sunscreen application (Rothman & Salovey, 1997; Rothman et al, 1993; Tversky & Kahneman, 1981). There are a number of ways to construct gain or loss framed health

communications. First, a health recommendation can focus on either outcomes associated with health-promoting behaviours (for example the use of condoms during sex) or outcomes associated with health-damaging behaviours (for example to have unprotected sex). Second, the consequences in framed messages can differ in both their desirability and their likelihood. Gain-framed messages can focus on attaining a desirable outcome or avoiding an undesirable outcome. In contrast, loss-framed messages can emphasise the risk of an undesirable outcome or the avoidance of a desirable outcome.

Meyerowitz and Chaiken (1987) used prospect theory to predict the attitudes, intentions and current practice of women undergoing breast self-examination. As this behaviour is one that may possibly detect a health problem the study expected that information emphasising the negative consequences of not undergoing self-examination (loss-framed) would enhance the attitudes, intentions and behaviours more so than information detailing the positive consequences of self-examination. In line with previous research, attitudes and intentions towards breast self-examination and the practice of this behaviour was higher in those women who were presented with a negatively framed information pamphlet.

Investigating the effects of message framing with regards to tobacco smoking, Schneider, Salovey, Pallonen, Mundorf, Smith and Steward (2001) found that gain-framed video presentations enhanced beliefs, attitudes and behaviours in favour of avoidance and cessation. This study concluded by stating the benefits of gain-framed communication when promoting prevention behaviours such as smoking avoidance. McCall and Ginis (2004) examined the effects of a framed health

education message on adherence to an exercise programme in a population of cardiac patients. Participants were randomly allocated to one of three groups, who read either gain-framed, loss-framed or no message about the importance of exercise for coronary heart disease rehabilitation. At a 3-month follow up patients from the gain-framed group participated in more exercise than those in the control group. Results suggest it may be valuable to use gain-framed educational materials in the cardiac population. Further support for the motivational influence of positive message framing comes from Jones, Sinclair and Courneya (2003) who report the potential benefits of providing exercise related information which emphasizes benefits rather than fear appeals. Examining the influence of source credibility and message framing of physical exercise promotion, Jones et al. (2003) report that behaviours and intentions related to exercise were higher in groups who had read a positively framed communication from a credible source.

Evidence in support of prospect theory is varied. Examining the effect of positive-framed, negative-framed and neutral communication regarding testicular self-examination, Steffen, Sternberg, Teegarden and Shepard (1994) found no significant difference in attitudes, intentions, or practice of the behaviour between conditions. The assumptions of Prospect Theory were also not supported in research investigating annual mammography uptake in a sample of 929 women (Finney & Iannotti, 2002). Findings of this study identified no significant difference in patient response to communication that was framed either positively, negatively or sent as a standard mammography reminder letter.

Studies investigating the influence of message framing on children's health perceptions and health behaviours are limited. However, recent pilot research (Bannon & Schwartz, 2006) suggest framed messages can be beneficial in promoting healthy eating and fruit selection in young children. A total of 50 children attending kindergarten were randomly allocated to one of three conditions. Children (n=14) in a gain-framed condition viewed a video of a nutritional message emphasizing the positive benefits of eating apples. In contrast, children (n=18) in a loss-framed condition viewed a video of the negative consequences of not eating an apple. Finally, children (n=18) in a control condition watched a video of children playing a game, unrelated to healthy eating or apples. Both videos showed a young boy and a young girl in front of a bowl of fruit followed by the opportunity for them to play with other children. A voiceover at the beginning of the video stated that apples are a healthy choice and good for you. The gain-framed message goes on to say "*if you choose to eat healthy foods like apples you will have more energy to play and be active, especially with your friends*", this is followed by the image of the young boy and girl taking an apple and then playing happily with other children. The loss-framed message stated "*if you do not choose to eat healthy foods like apples you will not have as much energy to play and be active, especially with your friends*", this is followed by the image of the young children picking up an apple and then putting it back and shaking their head sadly when asked to play, leaving their friend disappointed. As eating well is a preventive behaviour, the study predicted that the gain-framed message would produce the most significant results in encouraging snack food selection (a choice of apples or animal crackers). Results from a series of chi-square analyses, however, did not support this hypothesis, with the loss-framed condition being significantly more effective ( $X^2(1, 18) = 4.00$ ,

$p < 0.05$ ) at encouraging the selection of fruit. In addition, the effect of the gain-framed video on snack food selection approached the significance level ( $X^2(1, 14) = 3.57, p = 0.059$ ). Findings from this study revealed that children who were allocated to an experimental (framed) condition showed a significantly higher (56%) preference in apples rather than animal crackers for their day-time snack compared to the control condition (33%). Conclusions drawn from this study are limited as the behavioural measure of snack choice was collected on the day the video was viewed and does not represent long-term effects.

The relative effectiveness of gain-framed information is thought to be proportional to the degree in the belief that behaviour will maintain health. People process health-relevant information actively, therefore, behavioural responses to framed information are assumed to be a function of both the framed message and pre-existing perceptions of the health issue (Clark, 1994). In particular, experience with a health issue should influence one's receptivity to information about gains or losses and whether a behaviour is perceived as risky or uncertain to adopt. Persuasion models found in marketing literature suggest that individuals who are highly involved with an issue are likely to process relevant messages in greater detail (Chaiken, 1980). Therefore, to predict the impact of a certain health recommendation there is a need to attend to the factors that mediate the relationship between framed messages and subsequent behaviour (Rothman & Salovey, 1997). The lack of research investigating message framing effects and Prospect Theory with children within the research literature is reinforced in recent research (Bannon & Schwartz, 2006). The current research programme aims to use positive and negative message framed intervention strategies with healthy children to examine which method is the most effective in enhancing behavioural intentions and

behaviour in relation to the target health behaviours (healthy eating, regular exercise, avoiding smoking cigarettes and alcohol) while incorporating previous perceptions of health behaviours .

### **5.2.2 Children's Healthy Schools Programme**

Over the last decade, school health has become an integral part of the nation's public health agenda. As a result of the publication of *Our Healthier Nation*, in 1998 the Government set up a scheme known as the Healthy Schools Programme. Funded by the Department of Health and the Department for Education and Employment (DfEE) with £4 million, the aim was to build on the concept of the healthy school. The objectives were to promote educational achievement, health, emotional wellbeing and quality of life. Several sites are now in place across England to investigate and address issues such as school ethos and the learning environment, planning, and teaching of personal, social and health education (PSHE) in schools.

Key areas and themes are set out by the National Healthy Schools Standard, and the schools involved need to address these to the standards set nationally for the accreditation of their programme. The key areas are (1) drug education (including alcohol and tobacco), (2) healthy eating, (3) physical activity, (4) sex and relationships education, (5) safety, (6) emotional health, (7) personal, social and health education, and (8) citizenship. The scheme is evaluated and audited on the basis of how many schools have joined the programme, and how many have become successful in the accreditation process. School staff implement the programme, and go through training and professional development in healthy schools work, receiving feedback and support from parents, pupils and community partners. Recent reports



suggest the healthy schools programme has been positively accepted by parents and pupils, although with some criticism (Warwick, Aggleton, Chase, Schagen, Blenkinsop, Schagen, Scott & Eggers, 2005). However, from personal communication from the healthy schools advisor for the South East region, it seems there is no official audit or evaluation of how effective the programme has been in the promotion of children's health behaviour.

Supporting the programme are projects to assist schools to meet the standards the scheme has set. A website entitled 'Wired for Health' ([www.wiredforhealth.gov.uk](http://www.wiredforhealth.gov.uk)) has been designed to provide young people with information so they can make informed choices surrounding their health. The website further aimed to provide teachers and parents with factual health-relevant information and advice. A further programme entitled 'Cooking for Kids' is offered in a selection of schools in the summer holidays to support home economics teaching and skills relating to nutrition, food hygiene, and basic cooking and preparation. This programme is part of a long-term strategy for reducing coronary heart disease and cancer by giving children an understanding of what comprises a healthy diet (DoH, 1992). It provides opportunities for expanding the provision of breakfast clubs in schools and improving the nutritional value of school meals. The '5 A DAY' campaign (DOH, 2003) also aims to communicate consistent messages regarding the amount of fruit and vegetables that contribute to one portion. The Department of Health has, however, stated their intention to change one of the key messages of this campaign to 'a handful' measure in a bid to simplify the '5 A DAY' message (Foster & Buttriss, 2005). To support the physical activity initiative, the 'Safer Travel to

School' scheme, encourages children to walk or cycle to school along safe routes, and attempts to reduce the use of motor vehicles for journeys to school (DoH, 2004). Linked to this initiative, Kurtz and Thornes (2000) examined the use of the Healthy Schools Programme in schools in four of the sites in England specifically investigating the health needs of school-aged children. Focus groups with children, parents and teachers were run in a semi-structured manner. Informal cues were used, such as 'What is health?', 'How is health maintained and promoted?', 'What are the causes of unhealthiness and how can it interfere with everyday life?', and 'Where to go for help and advice?' Just over 100 children participated with the groups, drawn from year 1 (aged 5-6), year 6 (aged 10-11), year 9 (aged 13-14), and year 11 (aged 15-16). Fewer parents participated for various reasons, including travel.

The research found that children's knowledge of health matters was good. They seemed to have greater knowledge than their parents, and most of their teachers. Children from a young age were able to communicate accurate information about the importance of healthy eating, regular exercise, and not smoking to reduce their risk of developing short-term health problems such as obesity, and long-term health problems such as cancer and heart disease. Many primary school children expressed disgust at smoking and commented that it was a "*Smelly habit*" and was "*Dangerous for other people nearby who might inhale the smoke*" supporting previous findings of children's attitudes towards passive smoking (Woods et al, 2005) mentioned previously in Chapter 3. However, the children participating in this study were unsure about how they would react to peer pressure to try cigarettes, which they felt would be inevitable when they reach secondary school. Their fears

were heard by statements such as, *“They call you chicken if you don’t agree”* and *“They think its cool to smoke”*. Secondary children suggested reasons why they may engage in smoking behaviours by saying *“Your friends might smoke”* and *“You might want to copy other people”*. Several of the children at this age smoked. One 14 year-old girl stated that she was trying to give up, not because of health but because of expense. There is evidence that many young people who smoke would like to give up, however, there is a gap in advice, support and education given to these young people. The dangers of alcohol were seen by primary school children in terms of controlling intake and the possibility of driving while drunk. Secondary school children described its dangers in association with violent behaviour, for example one child commented, *“When you’re drunk you might get into fights, or vomit or end up hurting someone”*. Both primary and secondary school children expressed concern over obesity and how it may affect their life, one child stated, *“You get tired quickly”*. Most felt it was their own job to look after their health, but one child who was overweight was working in partnership with his mother.

When asked to describe unhealthiness, primary school aged children tended to explain it in terms of older relatives and their health behaviours; *“My mum smokes”*, *“My dad started a new job and has put on a lot of weight”*, *“My aunt and uncle are overweight”*. They were also aware of the problems of addiction *“My dad is trying to give up [smoking] and gets very bad tempered”*. Most children connected ill health with age. Older children disregarded the possible results of risk behaviours. This supports previous evidence that children show a lack of concern for their future health status (Taylor, 1995) and express low levels of perceived vulnerability and health value (Gochman, 1987). However, many young children were critical of

parents and other family members who lead unhealthy lifestyles, especially smoking. They were also proud of parents who were perceived to be living a healthy lifestyle. In contrast, parents themselves lacked confidence in their knowledge about healthy options and in implementing them for themselves and their families.

When asked where they would go for help and advice, primary school children said they would go to their mothers or close friends. Secondary school children were often unsure of where to go for help. Children showed confidence only in adults they recognised as experts in certain areas, for example police with regards to drugs. This supports the notion that for information to be accepted it needs to be transmitted through a credible source (Grewal, Gotlieb & Marmorstein, 1994). The study revealed that children wanted to learn about health risks from people who they could talk to openly, who would allow them to explore their feelings and ideas, and who they felt were comfortable talking about such matters. They also stressed the importance of confidentiality. They needed someone they could trust, who knew them quite well and who would not break their confidence. None of the children in the secondary schools thought anyone at the school could be trusted except for their friends. They said they could not trust teachers and thought of the school nurse only in terms of immunisations and dealing with minor accidents. This lack of support is a potential problem in schools today. Parents within this study welcomed the idea of a school-based health centre. They reported being often confused as to whom to turn to when they have a health concern of their child.

Kurtz and Thornes's (2000) study shows an increase in the prevalence of unhealthy behaviours, however, the children's knowledge of the health risks does not appear to have much influence on their choice of action. The importance of psychological factors, such as perceived control and self-efficacy in influencing health risk and promoting children to make active healthy choices must not be ignored. There is a need to increase and integrate a multidisciplinary and interagency response to children's health needs, before they become ill. Effectiveness will be greater if interventions are focused on prevention as opposed to treatment.

### **5.3 Designing a Public Health Intervention**

When considering the design of a public health intervention, it is useful to follow the Generalised Model for Programme Development proposed by McKenzie and Smeitzer (2000). The initial planning of an intervention is key to a successful programme. Initial consideration should be directed towards the need for the intervention in the first place. For example, will changing health behaviour X really result in a substantial reduction in disease outcome Y? Or more specifically to this research programme, will changing health behaviour intention X result in a substantial reduction/increase in health behaviour Y?

Once a need for an intervention has been identified, it has to be designed appropriately. First, there must be an engagement with and an understanding of the target audience. This could be achieved through an extensive literature review, or focus groups with the target group of interest. Often, interventions designed for children are developed with little regard for or input from the children themselves (Backett & Alexander, 1991). This can have ramifications for the intervention

programme as the needs of the target audience must be understood and assessed. This entails collecting information/data to develop an understanding of their issues and/or constraints (for example, collecting data on their cognitions, beliefs and experiences with the health behaviours of interest). From here, goals and objectives of the intervention need to be formalised; what can realistically be achieved from the intervention and how will this be accomplished? After addressing these questions the design of the intervention can be formatted. It is important that the intervention is relevant to the audience and conducted by a credible, trustworthy source. A lecture on heart disease to a sample of children, for example, may not be sufficient to engage them in actually thinking about the consequences of their health behaviours. It is important in this case to make the intervention enjoyable, and full of activities that will inspire thought and empowerment. Consideration must also be given to where, when and for how long the intervention will take place. Finally, the effectiveness of the intervention must be evaluated. These salient issues will be discussed further in relation to study 2 of the current research programme in Chapter 6.

Nutbeam and Smith (1991) suggest five factors that need to be considered for a successful health evaluation targeted at school-aged children; 1) the use of pre-test studies to establish baseline measurements, 2) the use of a representative sample from the target audience, 3) the random assignment of participants to intervention and control groups, 4) the use of a clearly designed intervention and 5) the use of post-test studies to identify change from baseline measurements. There are, however, several drawbacks to school-based evaluations including contamination of the intervention through children socially sharing the content of an intervention and

the fact that they are participating on a voluntary basis and may be subject to bias. All these factors will be discussed further in Chapter 6.

#### **5.4 Intention-Behaviour Relationship**

Several theories, such as those discussed in Chapter 3, extensively use a person's behavioural intention to act as a valuable measure of subsequent action regarding the behaviour. An intention is the instruction an individual gives themselves to perform a particular behaviour or achieve a certain goal. Although some people may develop an intention towards a behaviour, they might not take any action (Sheeran, 2002). This discrepancy has been labeled the "intention-behaviour gap" and is currently regarded as a focal challenge for research (Sniehotta, Scholz & Schwarzer, 2005).

Given the reliance on the measurement of 'intention' in health cognition models, it seems plausible to question how well behavioural intentions predict health behaviours. In a meta-analysis of prospective tests on the relationship between intention and behaviour, Sheeran (2002) concludes that intentions are reliable predictors of behaviour. From a sample of 82,107 participants across 422 studies, intentions accounted for, on average, 28 percent of the variance ( $R^2 = 0.28$ ). Therefore, the pivotal role of intention in predicting behaviour seems to be supported in the literature. Investigating the predictive ability of intentions further, Sutton and Sheeran (2003) asked the question, 'To what extent do intentions predict behaviour *change*?' Evidence from a meta-analysis of 51 studies, involving a total sample of 8,166 participants showed significant inter-correlations between past behaviour, intention and future behaviour, with past behaviour being a strong predictor of future behaviour ( $R^2 = 0.26$ ), and intentions showing a significant

association with behaviour change (Sutton & Sheeran, 2003). There are, however, still substantial ‘gaps’ between intention and behaviour. Over a number of studies investigating exercise, condom use and cancer screening, just under half of the median proportion (47%) of participants who showed an intention to perform a behaviour, did not see this intention through to action (Sheeran, Milne, Webb & Gollwitzer, 2005).

#### **5.4.1 Health Action Process Approach**

There is a lack of theories that attempt to bridge the relationship between intentions and actual behaviour. More is needed than just a behavioural intention to initiate a complex action such as refraining from smoking or adapting longstanding eating behaviour.

The Health Action Process Approach (HAPA) is a model developed by Schwarzer (1992), based on the Theory of Planned Behaviour and Perceived Self-Efficacy, which attempts to bridge the gap between intentions and actual behaviour. The HAPA suggests that the adoption, initiation, and maintenance of health behaviours must be conceptualised as a process that involves two phases, a motivation phase and a volition phase. During the motivation phase, the individual forms an intention to either adopt a precaution measure or to change a risk behaviour. The volition phase focuses on cognitions that instigate and control the action and can be subdivided into a further three phases, planning, action and maintenance. This second phase describes how hard people try and how long they persist. It is claimed that self-efficacy plays a vital role at all stages, while other cognitions have a limited scope. For example, risk perceptions are important for contemplation processes



early in the motivation phase, however, are not significant after a health behaviour decision has been made. Moreover, outcome expectancies are highly important during the motivation phase when individuals weigh up the pros and cons of possible consequences of behaviours, however, they lose their predictive power after a decision has been made. Perceived self-efficacy is suggested to be important throughout these phases, influencing an individual's considerations in their ability to adopt, initiate and maintain a desired action. (Schwarzer, 1992).

From the three initial processes included in the motivation phase that are seen as predictors of intentions, it is believed perceived self-efficacy and outcome expectancies are the more dominant. Outcome expectancies are seen as precursors of self-efficacy, as people usually evaluate possible consequences of behaviours before contemplating whether they feel they are competent to take the action themselves. Although it is believed a small amount of threat or concern must exist before people start contemplating the benefits of possible actions and question their ability to actually perform them (Schwarzer, 1992).

When an intention has been formed, it needs to be transformed into detailed instructions of how to perform the action. This then needs to be maintained. The cognitive structure of an action plan, and a high degree of self-efficacy to visualise scenarios of success, guide the action and enables it to continue when difficulties arise (Schwarzer & Renner, 2000; Schwarzer, 1992). A person trying to lose weight for example would need a plan of action to cover what foods to buy, when and how much to eat, when and where to exercise, and so on. Such precise plans of action have been termed "implementation intentions" (Gollwizer, 1999) and are shown to

be powerful predictors of health behaviours such as healthy eating (Kellar & Abraham, 2005) and condom use (Abraham, Sheeran, Norman, Conner, De Vries & Otten, 1999).

When the action has been initiated, it must be maintained through further cognitions. The action could be at risk by opposing cognitions, therefore, a meta-cognitive strategy is needed to suppress competing action cognitions to enable completion of the initial action. Physical activity for example could be compromised by other motivational tendencies such as the desire to eat, sleep, or socialise. However, self-regulatory processes are required to suppress these cognitions, and to secure effort and persistence. Self-efficacy determines the amount of effort and perseverance given to a chosen action. Those with low levels of perceived self-efficacy are more likely to visualise scenarios of failure. They have a tendency to worry about possible problems in performance, and give up on their action early. Those with a high level of perceived self-efficacy however, visualise scenarios of success (Schwarzer & Renner, 2000), which guides the action and enables them to keep going when difficulties arise.

An action is not just about performing intended health behaviour, but also refraining from risk behaviour. Suppressing maladaptive health actions also requires action plans and action control. For example, if an individual intends to quit drinking or smoking, they need to plan how this will be achieved. One plan could be avoiding high risk situations where there is temptation that may cause relapse. The concept of action control could be seen by the person in a high risk situation as making favourable social comparisons. When these meta-cognitive and internal coping

skills are developed and matched to specific risk situations, behavioural urges will be easier to control (Schwarzer, 1992).

### **5.5 Empowerment Education**

The concept of perceived personal control is repeatedly reported as a significant factor in the initiation and maintenance of health-enhancing behaviours (Schwarzer, 1992). In contrast it has been suggested that lack of control, or powerlessness, is a key factor for disease (Wallerstein, 1992).

A number of methods have been suggested to achieve elevated self-efficacy beliefs (Bandura, 1994; Bandura, 1991). The first is through personal mastery of a behaviour leading to a rise in confidence in the ability to perform behaviour through personal experience. If individuals experience success too easily, however, they tend to expect results quickly and are often discouraged by failure (Bandura, 1994). Self-efficacy can secondly be strengthened by vicarious experience, observing the successful behaviour of others. Seeing other people succeed is thought to raise individual beliefs in the ability to achieve similar activities. Finally persuasive techniques can be used to enhance self-efficacy beliefs. Individuals who are persuaded verbally that they can perform an activity are thought to increase their belief that they have what it takes to succeed (Bandura, 1994). In general perceived self-efficacy can be enhanced by increasing the individual's beliefs in their ability to perform a recommended response (Norman et al, 2005).

Such efforts to create a sense of personal control of behaviours and behavioural outcomes can be likened to the concept of 'empowerment'. This term is used

frequently in many of the applied sciences and has a number of varying definitions that ultimately mean to give someone power. Although, a concept such as this may be seen as patronising to individuals who are comfortable with external beliefs of self-regulation and personal control. However, as discussed previously, the essence of control or in the above terminology personal 'power' is a strong predictor of positive health behaviour performance. Therefore, it is in the interest of health professionals aiming to improve the health of the nation, to utilise the strength of such cognitions and work with them in an attempt to 'empower'. Individuals can then have the opportunity to accept or reject the information they receive using such strategies enabling a greater aspect of informed choices surrounding their health.

## **5.6 Summary**

Due to the epidemiological shift of the leading causes of death that have been witnessed over the last decades, governmental policies in the UK, other European countries and the United States, now have a heavy focus on the prevention of the leading causes of death through the reduction of behavioural risk factors. There seems, however, to be a gap between research and practice in terms of intervention programmes based on public health policies with regards to the area of health promotion.

Psychology has much to contribute to health care in both medical and non-medical settings. However, in relation to policies such as the *Health of the Nation* (1992), and *Our Healthier Nation* (1999) it seems psychologists were not incorporated to aid the development of the key targets initially, and are not employed thereafter to assist achievement in schemes such as *The Health Promoting School*. The danger of

neglecting psychological models and the role of psychology in health care can be very substantial. Research has found that such neglect has led to the absence of a framework within which to understand the behaviour of health professionals and their patients. This in turn has led to doctors and nurses being blamed for poor health outcomes (Marteau & Johnston, 1987). The use of psychological models offers a wider view, offering many variables that may relate to the individual as well as to the health professional.

It is acknowledged that effective health promotion interventions are needed to reach official health targets set by the UK government. Governments must inform, educate and empower individuals to maintain their health. Many of the key target areas cited in the Government white papers are associated with behavioural and social risk factors, which in principle can be addressed by psychosocial intervention. However, interventions based on these principles are limited. Often it seems information and education are solely intended to have an effect on behavioural change. The Department of Health has acknowledged that information alone is insufficient to promote behaviour change and that human behaviour is much more complex. In the recent white paper *Choosing Health* (DoH, 2004) the Government has confirmed the importance of the application of health psychology to the effectiveness of behaviour change. Health psychologists now face the challenge of providing valid and reliable research that demonstrates evidence-based interventions designed to facilitate behaviour change that can effectively enhance health at individual, community and national levels (Abraham & Michie, 2005).

This chapter has discussed two types of public health intervention. Mass media campaigns, and with specific reference to children, the healthy schools programme. Evidence from the evaluation of children involved in the healthy schools programme (Kurtz & Thornes, 2000) suggests a need for an integrated health promotion strategy within the school network. Children's knowledge of health behaviours in this study were good and they related ill health to older relatives. This supports concerns discussed previously in Chapter 3 of the apparent gap between health-impairing behaviours and long-term consequences. Kurtz and Thornes (2000) reported the uncertainty of children about appropriate people to approach when seeking health-relevant help and advice. There was an apparent need for access to trustworthy and credible sources to provide health-relevant information and support.

Research investigating methods used in mass media campaigns such as attitude and communication theories have found health-relevant information is more readily accepted if the person communicating the information is seen as attractive and credible (DeBono & Telesca, 1990) and the message does not instil high levels of fear (Franzkowak, 1987). As discussed in Chapter 3, children also have lack of experience with negative health outcomes and perceive the health threat of certain behaviours to their own health to be low (Gochman, 1987). This in turn is reported to contribute to an unrealistic, optimistically biased risk perception (Greening, Stoppelbein, Chandler & Elkin, 2005). This may desensitize children to potential health risks and minimise the effectiveness of so called 'fear-appeals' that attempt to motivate behaviour change by fear arousing communications.

The frame of health-relevant information can also influence the effect and receptiveness of the message. Prevention-oriented behaviours such as those of interest in the current research programme are most successfully promoted in the adult population via gain-framed (positive) health communications (Rothman & Salovey, 1997; Rothman et al., 1993; Tversky & Kahneman, 1981). There is a deficiency in empirical evidence providing information on the role of message framing in children's health promotion strategies. However, a recent study provides evidence that in children loss-framed messages produce the most significant effects of health-relevant behaviour (Bannon & Schwartz, 2006).

Behavioural intentions have been found to be reliable predictors of health behaviors in the adult population (Sheeran, 2002) and are often the subject of measurement in health-relevant communication interventions. Study 1 of this research programme has identified factors that have been found to significantly predict a child's health behaviour intention. To build on this, study 2 aims to identify if behavioural intentions are significant predictors of actual health behaviour in children. The 'intention-behaviour gap' mentioned previously has not been empirically investigated in children. The HAPA (Schwarzer, 1992) attempts to theoretically bridge this gap, emphasizing the salient function of self-efficacy, and to a lesser extent, outcome expectancies in intention development and health behaviour performance. In essence of this, it seems evident that an intervention aiming to increase health-enhancing behaviours (and intentions) would include an element of self-efficacy fortification.

In sum, with specific reference to behaviour-change interventions, an effective intervention must appeal to the target audience. Based on social marketing strategies public health campaigns assume that if the right message is given, in the right way, at the right time, people will accept and act upon it (Hastings & Haywood, 1991). The intervention must be relevant, in the language of the receiver (children) and emphasize the similarity between them and the source of the message so the target audience sees the issue as affecting ‘someone like me’. The acceptance of health-relevant information being communicated will be influenced by the credibility and attractiveness of the communicator. Finally, the message must be motivational. Children need to have a good reason to change (maintain) health behaviour that is not related to a threat of illness or disease, such as increased energy or attractiveness. It also needs to seem possible. Feelings of internal control and self-efficacy can be enhanced by making suggestions for action such as making a weekly plan, visualizing successful behaviour performance or being provided with information of others similar to themselves who successfully perform the health behaviours of interest. Study 2 will utilize these strategies in an attempt to enhance health behaviour intentions and performance.



## Chapter 6: Study 2 – Promoting Health: An Intervention Approach

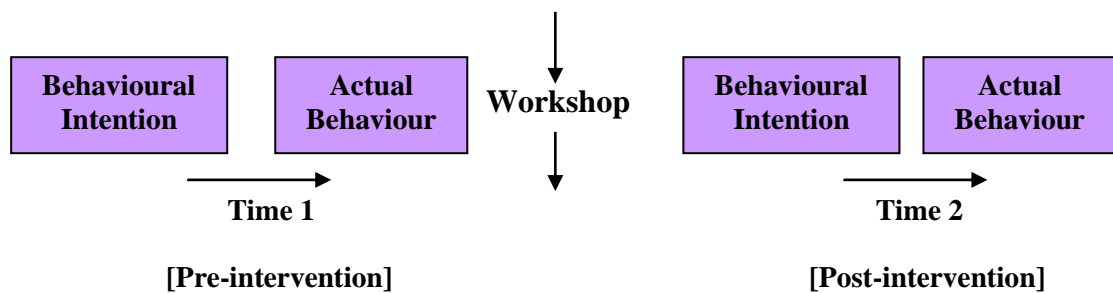
### 6.1 Aims and Objectives

The second study of the current research programme focuses on the link between children's intentions to the health behaviours of interest (healthy eating, regular physical activity, avoiding smoking cigarettes and avoiding drinking alcohol) and the actual health behaviours they perform. It aims to examine the question whether a child's *intention* to the target health behaviours is a significant predictor of their *actual* health behaviour. There is a lack of theories that take predictions further from intentions to actual behaviour. More is needed than just a behavioural intention to actually perform a health behaviour. In light of this, the second study aims to develop and run a series of theoretically based intervention workshops to enhance cognitions salient to promote health behaviours, manipulating the frame of individual workshops to address health behaviours in either a positive or a negative way. The objective was to explore the effectiveness of the intervention workshops on enhancing children's behavioural intentions (compared to those previously given in study 1) and their health behaviours. The underpinning rationale for this second study is that there remains a gap in the literature that really attempts to link research and practice resulting in a limited use of theoretical constructs in behaviour change interventions.

Study 2 followed each child through several 'time-lines' in an attempt to examine whether their intention to target health behaviours was an accurate predictor of the behaviours they actually engaged in and whether a theoretically based intervention workshop had any influence over these behaviours. Actual health behaviours were

measured one week after the first set of data was collected on behavioural intentions in study 1. The behavioural intentions and health behaviors were then measured again after exposure to an intervention workshop in study 2.

An overview for this second study in the research programme is presented in Figure 31 below.



**Figure 31: Overview of study 2.**

## 6.2 Literature review

As discussed in previous chapters, children are now beginning to learn and experiment with a number of health behaviours at an early age, and the salient concept of health promotion is an attempt to minimise the number of those at risk. Children may be a suitable time to emphasise the important function in health promotion of taking control over personal health.

Behavioural intentions are reported to be reliable predictors of health behaviors in adult populations (Sheeran, 2002) and are often the subject of measurement in health-relevant communication interventions. Study 1 identified factors that could significantly predict a child's health behaviour intention. To build on this, study 2

aims to identify if behavioural intentions are significant predictors of actual health behaviour in children. The ‘intention-behaviour gap’ mentioned previously has not been empirically investigated in children.

Research from the previous chapter suggests that successful communication of a health-relevant message should ensure that the source of the message is credible (DeBono & Telesca, 1990), the message content is relevant to the target audience and does not provoke disassociation from the message (Franzkowak, 1987; Soames-Job, 1988) and a realistic strategy to achieve behaviour change is offered (Norman et al, 2005). In terms of motivating behaviour change the Health Action Process Approach (Schwarzer, 1992) and the Protection Motivation Theory (Rogers, 1975) both suggest that enhanced self-efficacy beliefs play a key role. The overlap of these two models must also be noted (see Chapter 3). Self-efficacy and outcome expectancy cognitions are included in both the HAPA and PMT, outcome expectancies termed response efficacy in PMT. They further feature in the Theory of Planned Behaviour but are described as perceived behavioural control and behavioural beliefs respectively. They are also the main elements in Self-Efficacy Theory. Both cognitions have been found to be significant predictors of behavioural intentions and actual health behaviour throughout the literature and the findings of study 1. Study 2 will draw on the strength of self-efficacy and outcome expectancy beliefs in their ability to predict health behaviour and aims to enhance these cognitive constructs through intervention workshops. In light of the success of framed message strategies in previous health promotion studies related to tobacco smoking (Schneider et al, 2001), exercise (McCall & Ginis, 2004) and healthy eating choices (Bannon & Schwartz, 2006), these intervention workshops will be

manipulated by the frame in which they are presented examining the properties of prospect theory.

A number of methods have been suggested to achieve elevated self-efficacy beliefs (Bandura, 1991). The first is by personal mastery of a behaviour leading to a rise in confidence in the ability to perform behaviour through experience. A second method is by vicarious experience observing the successful performance of behaviour by others. Finally persuasive techniques can be used to enhance self-efficacy beliefs. In general to enhance self-efficacy it is necessary to convey to the individual that they have the ability to perform a recommended response (Norman et al, 2005).

### **6.3 Research Questions**

With the above aims and objectives in mind study 2 seeks to address the following questions:

1. Can an intervention programme based on psychological theories enhance a child's intentions towards certain health behaviours, and if so what frame of intervention works best?
2. Can an intervention programme based on psychological theories enhance children's actual health behaviours, and if so what frame of intervention works best?

3. Does a child's intention to perform certain health behaviours predict the health behaviours they actually perform?

## **6.4 Hypotheses**

### ***Hypothesis 1:***

There will be a significant increase in behavioural intentions post intervention within each of the experimental conditions compared to the control condition.

### ***Null Hypothesis 1:***

There will be no significant difference in behavioural intentions post intervention between each of the conditions.

### ***Hypothesis 2:***

There will be a significant increase in health behaviours post intervention within each of the experimental conditions compared to the control condition.

### ***Null Hypothesis 2:***

There will be no significant difference in health behaviours post intervention between each of the conditions.

### ***Hypothesis 3***

A high behavioural intention will be a significant predictor of behavioural action.

### ***Null Hypothesis 3***

Behavioural intention will not be a significant predictor of behavioural action.

## **6.5 Method**

### **6.5.1 Design – Study 2**

The second study employed an experimental repeated measures 2/3 factorial design. The first factor (two levels) was the repeated measurement of the child's health behaviour intention or health behaviour performance pre and post intervention. The second factor (three levels) was the three conditions of the intervention. The design employed a positively framed condition, a negatively framed condition and a control condition. The positively framed intervention group focused on a health promotive strategy, using message framing to promote the benefits of eating well, exercising and avoiding smoking cigarettes and drinking alcohol for both short and long-term health. The contrasting negatively framed intervention group adopted a more health preventive strategy, emphasizing the costs of not adhering to good health practices (for example, lack of exercise and an unhealthy diet may result in obesity). Finally, to reduce the risk of a placebo effect on the children's health intentions or behaviours, the control group had contact with the researcher for the same amount of time as each of the experimental groups. During the control sessions, the time was spent discussing subjects other than health and playing a non-health related game (hangman). Interventions were conducted separately for each of the two year groups in the research programme, year 7 and year 10.

The independent variables in study 2 were the intervention conditions the children participated in. These factors were manipulated between conditions to test any effect they had on the dependant variables of the child's intention towards the target

health behaviours (compared to pre-intervention), and the health behaviours performed (compared to pre-intervention). Behavioural intentions (both pre and post intervention) became the independent variables when looking at their predictive value of how well this intention translates into actual behaviour 1-week post intervention.

### *Statistical Analysis*

Two ANOVAs were conducted to determine any significant difference there may have been between the time 1 intentions and health behaviours between the three intervention conditions. It was important to establish the success of the random allocation to groups and to uncover any possible differences in baseline measurements that may have had an effect on later data analysis. A series of repeated measures ANOVAs were then calculated to investigate possible interactions between the conditions and behavioural intentions and behavioural performance at the two time points (time 1 – pre-intervention; time 2 – post intervention). These were followed by ANCOVAs to investigate the possible co-variation effects of year group and gender on the outcome data.

Finally the data were analysed using a series of multiple regressions, controlling for year group and gender in the first two steps to investigate the predictive value of behavioural intention on actual behaviour performance. These regressions were computed separately for each health behaviour and the two temporal elements (time 1 and time 2).

### **6.5.2 Participants – Study 2**

Participants in study 2 comprised a sub-sample of study 1. The experimental intervention workshops were trialed in school Q with 14 participants (7 in positive framed group, 7 in negative framed group). These sessions were successful, leading to no changes to the intervention schedule, and providing evidence that the time of 2 hours estimated for each workshop was adequate. It was, therefore, deemed appropriate that all data collected from this trial be entered into final data analysis.

Study 2 was then conducted in school M, with 58 participants entered into final data analysis (23 in positive framed group, 22 in negative framed group, 13 in control group). Due to time and cost constraints, the sample size for study 2 was limited to only two of the schools involved in the research programme.

Therefore, the data provided by 72 participants were included in the final study. Participants were randomly allocated to an experimental/control group, with each group comprising of 6-8 participants. In total, 30 participants (19 male, 10 female, 1 not disclosed) were assigned to the positive framed group, 29 participants (16 male, 13 female) were assigned to the negative framed group, and 13 participants (7 male and 6 female) were assigned to the control group. In relation to age, the positive framed workshops were attended by 16 year 7 pupils and 14 year 10 pupils. The negative framed workshops were attended by 15 year 7 pupils and 14 year 10 pupils and finally 6 year 7 pupils and 7 year 10 pupils attended the control group.



### **6.5.3 Materials – Study 2**

Study 2 includes data collected in study 1 via the HPQ to measure the perceptions of health behaviours, behavioural intentions and health behaviours pre-intervention. It also collected data from parts D, E, F and G of the HPQ to measure perceptions of the target health behaviours and behavioural intentions post-intervention (see Appendix A for the full HPQ).

Each participant was provided with a closed folder welcome pack containing three magazines provided by the British Heart Foundation (BHF) and a sticky label to write their name on. Participants in the experimental groups also viewed a ‘Heartworks’ video (also from the British Heart Foundation). These materials (described in more detail below) incorporate the salient aspects of successful communication mentioned in Chapter 5. They portray details of other young people’s health choices and provide guidance of how to change or maintain ‘healthy’ behaviours. The magazines are bright, colourful and interesting to read, targeting a young audience and the heartworks video is filmed in a fun and humorous way. The video also showed interviews of professionals working within the area of heart health who appeared to be knowledgeable and therefore credible.

Data on health behaviour performance was collected one week after both study 1 and 2 through a health behaviour schedule. Finally, a standardized intervention schedule was produced to ensure each experimental group received the same information and format of workshop. All materials will be described in more detail below.

### ***BHF Magazines***

Three age-appropriate magazines provided by the British Heart Foundation entitled 'Intake', 'Be active' and 'Hack' were distributed to each participant in study 2. Each magazine can be viewed in Appendix C. Intake (British Heart Foundation, 1998) aimed to convey factual information about eating well, food portions, food labels and concluded with a quiz and the food choices of two young readers. Be active (BHF, 2004) stressed the importance of physical activity and provided ideas of how to gain a sufficient amount of exercise. Finally, Hack (BHF, 2003) provides a A-Z list of factual information surrounding smoking cigarettes including the chemicals released from cigarette smoke and the health risks of smoking. Hack also provided information of support networks for those who wished to quit smoking.

### ***Heartworks Video***

The Heartworks video is a 15 minute teaching resource for personal, social and health education validated by the British Heart Foundation (2000) to an age-appropriate level for this sample. Described as a 'lively, fun and fresh look at how young people can enjoy a healthy lifestyle' (BHF, 2000), the video takes the form of a media studies project for four 13-15 year olds who were given the objective to 'sell' a healthy lifestyle to the rest of the class. The characters, named Martin, Abbie, Sharon and VJ, bring their own personal qualities to the footage, which predominately shows the group interviewing experts from the world of medicine, sport, food and advertising. The video is constructed in three sections entitled 'the heart', 'be active, eat well', and 'choices'. The first and second section aim to convey understanding of the salient role of the heart, exercise and healthy eating in

future heart health. The final part address the choices that can influence heart health and draws together a running theme through the video of the problems of peer pressure and individual choice.

Within the video, Sharon is seen as someone who enjoys drinking alcohol and going out dancing. Martin is a smoker who, with stained teeth and bad breath, cannot gain the attention of his love interest Sharon. Abbie is the intellectual of the group. She maintains a healthy diet but will avoid exercise at any cost. Finally, VJ who neither drinks nor smokes, has a keen interest in football. He, however, consumes large quantities of 'junk' food. The video concludes with the characters making positive choices regarding their health.

### ***Health Behaviour Schedule***

A Health Behaviour Schedule was used to collect information on the participant's daily health behaviours over the week following the completion of the HPQ in both study 1 and 2. The schedule lists the four health behaviour intentions (i.e. I intend to be physically active for 30 minutes everyday for the next week), and a chart on which to record the days each target health behaviour was actually performed over that week (see Appendix D). A measurement of daily performance was employed as a parametric alternative to categorical measurements that measure behaviours with response formats such as 'several times per week' 'once per week' or 'less than once per week' which have been utilized in previous research investigating children's health behaviours (Tinsley & Holtgrave, 1997). The assumption for the use of daily measurement is that a more accurate set of health behaviour data will be produced.

### ***Intervention Schedule***

A standardized intervention schedule and dialogue was followed for each of the intervention workshops and is presented in Table 32 below.

**Table 32: Intervention workshop schedule**

<b>Start Time</b>	<b>Activity</b>	<b>Duration</b>
00.00	Settling in	5 minutes
00.05	Ice breaker-introduction-write names on sticky label-tell group an interesting fact about name/ambition	10 minutes
00.15	Introduction – positive or negative – standardized	5 minutes
00.20	Watch BHF video – state: “When you watch this video think of the behaviours that could <i>benefit/damage</i> your health”	20 minutes
00.40	Quiz in groups “We are going to do a quick quiz – can you get into two teams (choose team name) – There is one answer sheet per team – lets see how much you guys know about these health behaviours.” Participants write answers on white board	20 minutes
01.00	Discussion – benefits or costs of health behaviours in teams “In your teams can you discuss the following question (positive or negative) Discussion and feedback on white board afterwards	20 minutes
01.20	Visualisation – positive or negative – read from sheet	10 minutes
01.30	Questionnaires – D, E, F, & G	25 minutes
01.55	Debrief, thank and give health behaviour schedules out	5 minutes

#### **6.5.4 Procedure – Study 2**

Participants who had provided consent to participate in study 2 were invited to join an intervention workshop conducted during two allocated school lessons. Randomly placed in the three intervention groups the participants were first briefed about the nature and time-scale of the workshop. They were assured that the information they gave would be kept completely confidential and all agreed that any personal information discussed in the session would not be disclosed to anyone outside the group.

Each workshop lasted just under two hours and began with an ice breaker task. Participants were welcomed and provided with a folder that contained three booklets from the British Heart Foundation, and a sticky label. As an ice-breaker task the participants and researcher wrote their name on the sticky label and introduced themselves to the rest of the group sharing an interesting fact about their name. This was a useful exercise used in previous studies (Porcellato, Dughill & Springett, 2002) to reduce apprehension.

After initial introductions, the researcher introduced the workshops using a standardized dialogue that varied slightly between the positive and negative framed groups. This dialogue is presented in Table 33 with the differences in the frame in italics and can be found separately for each frame in Appendix E.

**Table 33: Standardized dialogue used to introduce the intervention workshops.**

Standardized workshop dialogue
<p>“We are here today to look at behaviours that (<i>keep us healthy/ could make us unhealthy</i>). If you remember from the questionnaire you filled in for me a few weeks ago, the behaviours I am interested in are (<i>healthy eating, exercise, not smoking cigarettes and not drinking alcohol / unhealthy eating, lack of exercise, smoking cigarettes and drinking alcohol</i>). First we are going to watch a video about these behaviours. When you are watching this video, I want you to concentrate on the behaviours that (<i>keep you healthy/ could make you unhealthy</i>). After this, we will have a quiz and a discussion about how these behaviours (<i>can keep you healthy/could make you unhealthy</i>). Finally, I would like you to fill in some questions like the ones from the first questionnaire on these behaviours. Does anyone have any questions?”</p>

Participants were then asked to watch the BHF video with the standardized instructions; “When you watch this video think of the behaviours that could *benefit/damage* your health”. Many took the opportunity to take notes from the video which lasted just under 20 minutes.

Following a brief discussion of the video, participants were asked to get into teams and complete a short standardized quiz (see Appendix F) that asked questions such as “Carrying out exercise in small bursts of 10 minutes three times a day, is as beneficial to you as exercising for 30 minutes in one go?” This was followed by an in-depth answer and discussion.

Teams were then given a sheet with a standardized sentence to discuss and asked to list the benefits of healthy behaviour or costs of unhealthy behaviour depending on their intervention group (see Appendix G) and present their findings on the white board thus generating further discussion. The positively framed discussion group was asked to focus on the benefits of eating healthily, taking regular exercise, avoiding smoking and alcohol, such as feeling healthy, looking attractive and having a good quality of life. While the negatively framed group concentrated on the costs of not adopting/avoiding such behaviours, such as obesity, addiction and long-term health problems. The discussions following the student feedback on the costs/benefits of health behaviours surrounded issues contained in Table 34 below with the focus of the frame being guided by the researcher and remaining consistent throughout.

**Table 34: Discussion themes and frequency in positive and negative framed intervention workshops**

<b>Benefits of healthy behaviours (Positive frame)</b>	<b>No. times</b>	<b>Costs of unhealthy behaviours (Negative frame)</b>	<b>No. times</b>
Live longer	4	Risk of disease and illness	7
Look healthy	4	Death	6
Don't get fat	4	Gain weight/obesity	5
Less chance of getting disease and illness	4	Less attractive – bad breath, teeth, skin, hair	4
Save money	3	Mood swings	1
Better stamina	3	Harder to concentrate	1
Won't smell and teeth won't be yellow	3	Bad stamina	1
Won't get spots	2	Cough	1
More awake	2		
Less moody	2		
Overall healthier and happier life	1		

The positively framed intervention groups discussed the benefits of healthy behaviours and the most often reported themes were living longer, looking healthy, maintaining a good weight and reducing the risk of illness and disease. Saving money, increasing stamina and maintaining positive oral health were also mentioned fairly often (in three teams). Minimising spots and being less moody were also themes mentioned twice, as was being more awake, and finally overall health and happiness was mentioned once. Further to discussions around these areas, one year 7 pupil who participated in the positive framed intervention stated *“You may smoke or drink more because you are depressed”*. Another pupil added to this statement by saying *“People smoke coz they have problems with their family”*.

Costs of unhealthy behaviours were perceived as the opposite of benefits. Risk of disease and illness was the most frequent theme to be discussed (in 7 teams). Premature death was also the subject of much discussion, as was gaining weight and obesity. One year 7 pupil wrote *“Well you would not live for too long and you will be very unhealthy. You would live until you were 30-60 years old”*. A further year 7 child stated *“You would become obese and you would look ugly and you would get diseases. You could die early, before your parents”*. This statement was echoed by another year 7 pupil adding *“You might die early or ruin your life”*. Reduced attractiveness was a frequent theme for the costs of unhealthy behaviours with specific reference to bad breath, teeth, skin and hair. One year 10 pupil reported a cost of unhealthy behaviour would be *“no girlfriend”*, which may be in line with this theme and a possible reflection of the Heartworks video they would have seen prior to the discussion. Mood swings, poor concentration, low stamina and physical symptoms such as coughing were all mentioned once. Potential barriers to healthy



behaviours discussed in the negatively framed intervention included parental role models and that ‘parent’s buy food’, the media and peer pressure.

### ***Visualisation***

Finally, a standardized visualization dialogue was used (see Appendix H). Participants were settled with their eyes shut, to encourage a cognitive representation of the performance of the target health behaviours to either *stay healthy* or *avoid becoming unhealthy* depending on the intervention group. This technique is thought to be linked to higher self-efficacy beliefs that in turn provide positive guidance to mastery efforts (Schwarzer & Renner, 2000; Wood & Bandura, 1989).

Half of each intervention group were also be asked to develop an action plan (see Appendix I) to promote a healthy lifestyle. Incorporating the Health Action Process Approach (Schwarzer, 1992) these action plans were tailored to fit into the individual lives of each participant. For example, in relation to a healthy diet, the child could agree to eat a piece of fruit, at home, at 7.40am with his/her breakfast, and another with lunch, at 1pm, at school, and another when they get home from school, at 4pm, everyday for the next week. The action plans were designed to give specific instructions as to where, when and how the participants could achieve their health behaviour intentions (e.g. stick to healthful foods, be physically active for at least 30 minutes every day, avoid smoking a cigarette, and avoid drinking alcohol) will be performed.

At the end of the session, participants were thanked and reminded of the confidential nature of the study and their right to withdraw at any time. They were also provided with the opportunity to ask any questions or share any final comments. Finally they were given a further health behaviour schedule and a stamped addressed envelope to send to the researcher the week following the intervention to measure their adherence to the four behavioural intentions.

Experimental intervention groups also received an outcome evaluation sheet at the end of each session to gather information on the overall effectiveness of the sessions. Measuring the success of the interventions on a likert scale of 1-10 (10 being the highest), pupils gave an average of 8.38 [SD = 2.04] in terms of how interesting they thought the workshops were. A mean average of 8.45 [SD = 1.82] showed the level of new information the participants felt they had received. And finally, a mean average of 8.79 [SD = 1.70] represented the participants recommendation that the intervention workshops should be offered to other children. Therefore, the intervention workshops were rated highly by participants for interest and gaining new knowledge and were highly recommend to other children their age. In addition, valuable informal feedback from those who participated in the interventions expressed thanks for being 'chosen' to be in the interventions and for 'teaching them new things'. Participants stated they had learnt a lot from and enjoyed the sessions, with eight individuals sending letters privately to the researcher. The control group spent the same amount of time with the researcher, however discussing issues other than health and playing similar types of games to monitor any placebo effects which may have occurred as a result of having contact with the researcher.

## 6.6 Results – Study 2

### 6.6.1 Descriptive Statistics

Data provided by 72 participants was examined in study 2. In total, 30 participants were assigned to the positive framed group, 29 participants were assigned to the negative framed group, and 13 participants were assigned to the control group. In Table 35 it can be seen that of the 30 participants in the positive framed group 19 were male, 10 were female and 1 participant did not disclose their gender. The 29 participants of the negative framed group were 16 males and 13 females and the 13 participants in the control group were 7 males and 6 females. In relation to year group, the positive framed workshops were attended by 16 year 7 pupils and 14 year 10 pupils. The negative framed workshops were attended by 15 year 7 pupils and 14 year 10 pupils and finally 6 year 7 pupils and 7 year 10 pupils attended the control workshops. Attempts were, therefore, made for each group to be evenly distributed for gender and age. Due to the small sample sizes within each experimental group, inferential analyses were not split for year group or gender. However, possible co-variational effects from these variables were taken into consideration.

**Table 35: Cross-tabulation of intervention groups by year group and gender**

Intervention group			Year group		Total
			year 7	year 10	
Positive Framed	Gender	male	11	8	19
		female	4	6	10
		unknown	1	0	1
	<b>Total</b>	<b>16</b>	<b>14</b>	<b>30</b>	
Negative Framed	Gender	male	8	8	16
		female	7	6	13
	Total	15	14	29	
Control Group	Gender	male	2	5	7
		female	4	2	6
	<b>Total</b>	<b>6</b>	<b>7</b>	<b>13</b>	

### **6.6.2 Baseline Behavioural Intention and Health Behaviour**

Prior to examining the effects of the intervention workshops on the children's intentions to perform the health behaviours of interest the week following the study and the actual health behaviours they performed one week later, it was first important to investigate any possible significant differences between these variables in the randomly selected groups at time 1 (baseline) measurement. This is important as any difference found between the experimental positively and negatively framed groups and the control group could influence the overall assumed success or failure of the intervention itself.

#### ***Behavioural Intentions***

Baseline (pre-intervention) health behaviour intentions were first examined for any significant differences between the intervention groups. ANOVA revealed no significant differences between the intervention conditions for healthy eating intentions ( $F [2, 63] = 1.21, p > .05$ ), intentions to exercise regularly ( $F [2, 62] = 1.00, p > .05$ ), intentions to avoid smoking cigarettes ( $F [2, 65] = .68, p > .05$ ), and avoiding the consumption of alcohol ( $F [2, 61] = .99, p > .05$ ). Full details of the ANOVA effects and multiple comparisons can be found on the appended disk.

#### ***Health Behaviours***

A further series of ANOVAs found no significant difference between intervention conditions for healthy eating behaviours ( $F [2, 64] = .99, p > .05$ ), regular exercise behaviours ( $F [2, 64] = 1.19, p > .05$ ), and avoiding smoking cigarettes ( $F [2, 64] = 1.16, p > .05$ ). Significant differences were, however, found between the intervention groups for their baseline data measuring avoidance of alcohol ( $F [2, 64] = 3.30, p < .05$ ). Post hoc analysis revealed that this significant difference was due to the

drinking behaviours reported in the positive intervention group and the control group. The mean average for avoiding alcohol consumption in those randomly allocated to the positive framed intervention group was found to be 6.15 [SD = .92], compared with 6.83 [SD = .39] in the control group with the difference found to be significant at the 0.05 significance level.

### *Summary*

In summary, this data suggests that the random allocation to intervention groups produced no significant differences between groups at baseline (time 1) measurement for all four of the health behaviour intentions, and three of the self-reported health behaviours (healthy eating, exercise and avoidance of cigarettes). The significant difference found between the positive framed intervention group and control group for avoiding alcohol was controlled for in subsequent analysis.

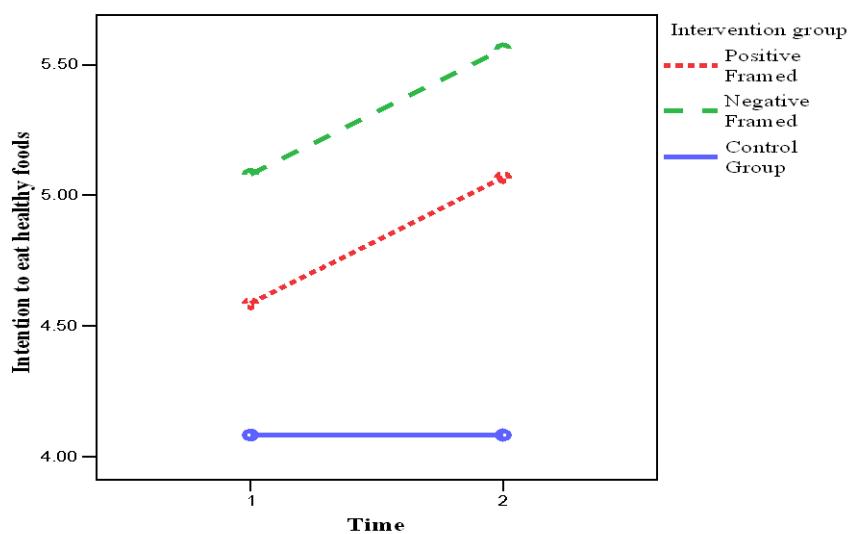
### **6.6.3 Intervention Effects on Health Behaviour Intentions**

The investigation then turned to the influence these separate intervention conditions may or may not have on behavioural intentions towards the four health behaviours of interest. Due to the previously noted differences between each of the health behaviours, analysis was conducted separately for each of the behavioural intentions. A series of repeated measures ANOVAs were performed with time 1 and time 2 intentions entered as the repeated dependant factor, and the intervention group (with three conditions: positive, negative and control) as the fixed factor. Further ANCOVAs were calculated to test for any co-variation effects of age and gender. Full output data can be found on the appended disk. It is worth noting here the overall difference in sample size of the three intervention conditions, with the control conditions containing the smallest number of participants. The statistical

procedures used in this study are believed to be strong enough to factor out any influence of differences in sample size.

### ***Healthy Eating Intentions***

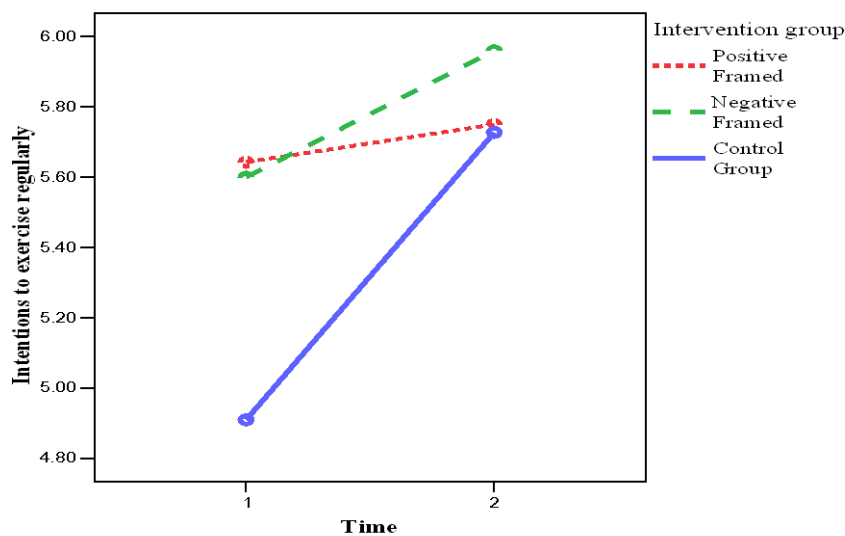
The intervention conditions were not found to significantly enhance intentions to eat healthy foods measured at time 1 and time 2 ( $F [2, 63] = .45, p > .05$ ). There was also no main effect of time ( $F [1, 63] = 2.32, p > .05$ ) or intervention ( $F [2, 63] = 2.91, p > .05$ ) on healthy eating intentions. Post hoc analysis did, however, reveal a significant mean difference of 1.24 ( $p < .05$ ) between intentions in the negative and control conditions. Figure 32 shows that although the difference between the two experimental groups (positive and negative frame) was not significant, there does seem to be a marked increase in behavioural intention between the two time periods in these conditions. ANCOVA was then calculated with year group and gender as co-variates to see if they had any influence, however, no effect was found ( $F [2, 60] = .48, p > .05$ ).



**Figure 32: Main effects of intervention condition and time on healthy eating intentions**

### ***Regular Exercise Intentions***

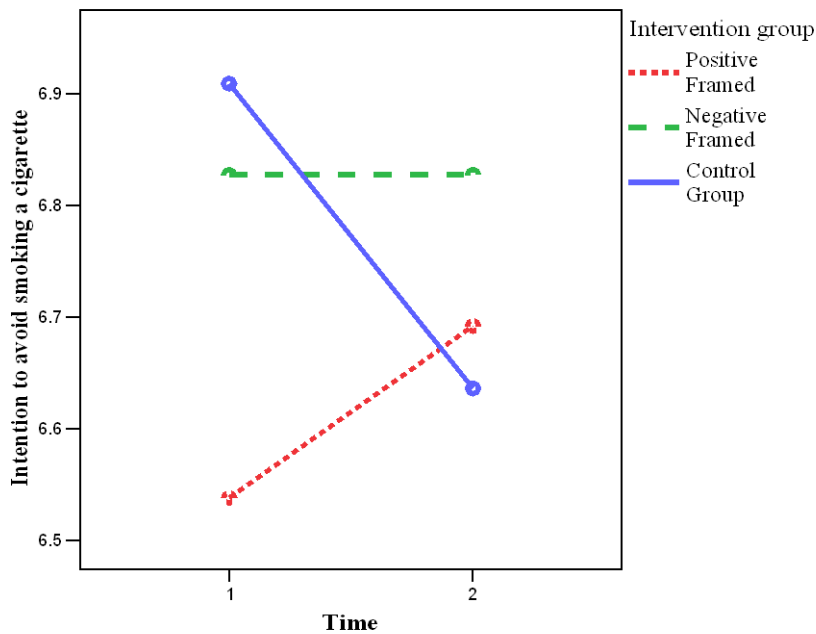
The intention to exercise regularly at time 2 was not found to be significantly enhanced from that of time 1 in either of the intervention conditions ( $F [2, 61] = 1.08, p > .05$ ). ANCOVA identified no significant variation in the above findings controlling for year group and gender ( $F [2, 59] = 1.06, p > .05$ ). Figure 33 shows there was no real difference between time 1 and time 2 for the intentions to exercise of those in the experimental conditions, however, there seems to be a marked increase observed in the intentions of those in the control condition. Further post hoc analysis, however, confirmed there was no main effect of intervention condition on exercise intentions ( $F [2, 61] = .56, p > .05$ ) and no significant difference between the means of each intervention group. A significant main effect was, however, found when measuring the intention to exercise between the two time frames ( $F [1, 61] = 5.30, p < .05$ ) confirming a general increase in intentions to exercise regularly from time 1 to time 2 for all participants.



**Figure 33: Main effects of intervention condition and time on regular exercise intentions**

### *Intentions to Avoid Smoking Cigarettes*

Contrary to the impression from Figure 34, there was no significant interaction effect between the repeated measures factor and intervention group ( $F [2, 63] = .75, p > .05$ ) on intentions to avoid smoking cigarettes. Nor were there significant main effects for either, time ( $F [1, 63] = .09, p > .05$ ) or group ( $F [2, 63] = .38, p > .05$ ), or effects for the co-variables age and gender ( $F [2, 60] = 1.08, p > .05$ ).



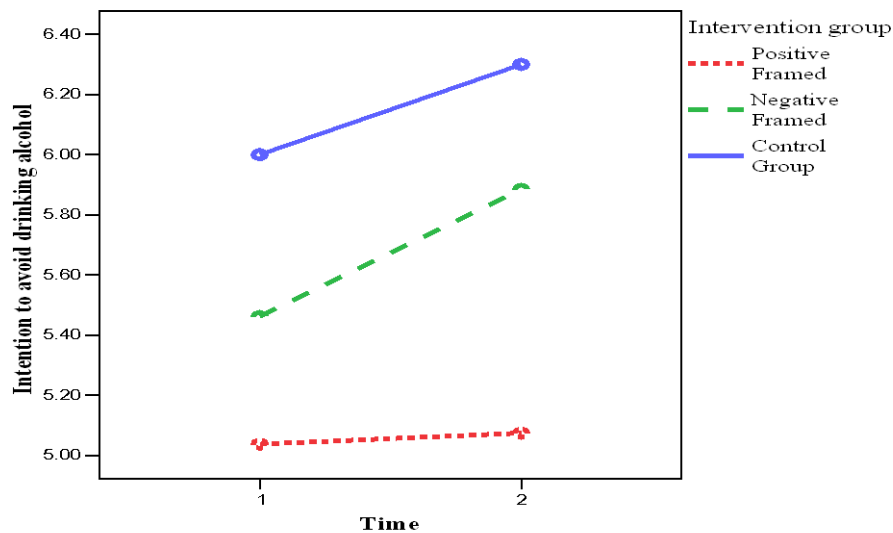
**Figure 34: Main effects of intervention and time on intentions to avoid cigarettes**

### *Intentions to Avoid Drinking Alcohol*

Finally, no significant intervention effect was found on the repeated measures of behavioural intentions to avoiding drinking alcohol when ANOVA was calculated ( $F [2, 60] = .27, p > .05$ ). These findings are presented in Figure 35. Year group and gender also provided no significant variation ( $F [2, 57] = .12, p > .05$ ). Investigating



main effects of the individual variables, neither time ( $F [1, 60] = .89, p>.05$ ) nor group ( $F [2, 63] = 2.37, p>.05$ ) were found to have an effect on behavioural intentions.



**Figure 35: Main effects of intervention condition and time on intentions to avoid alcohol**

### *Summary*

To summarise, experimental effects on health behaviour intentions of the intervention workshops designed for study 2 were insignificant. No interaction effect of the repeated measurement factor and intervention group was found for any of the health behaviour intentions

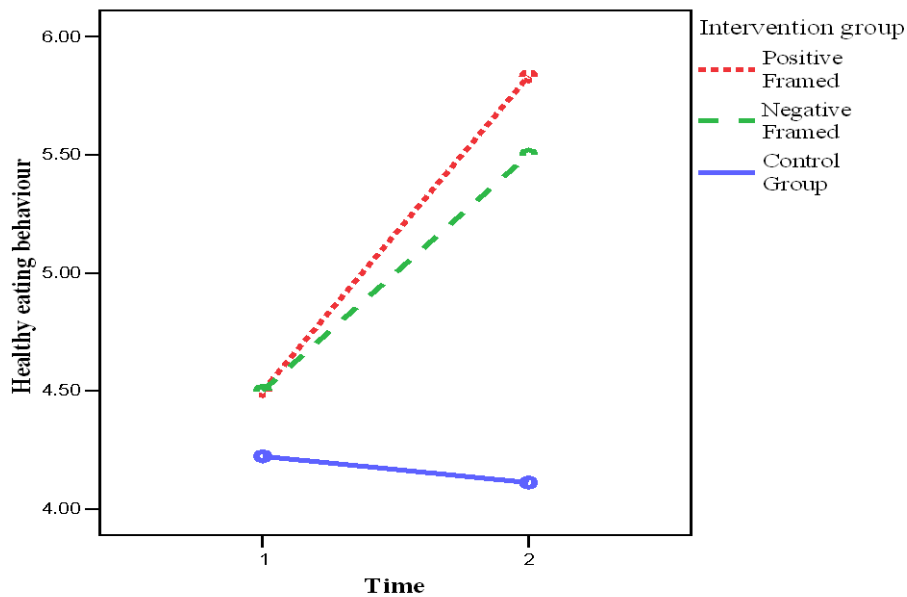
There was, however, a significant main effect found with the repeated measures of time on exercise intentions, which confirmed there was an increase in intentions to exercise from time 1 to time 2. In contrast, no significant difference was found between the two time points for intentions to eat healthy foods, avoid smoking cigarettes or avoid drinking alcohol.

#### **6.6.4 Intervention Effects on Health Behaviour Performance**

The focus of the investigation then turned to possible intervention effects on the health behaviours the children reported they had performed (or avoided) the week after they provided their behavioural intentions. A further series of repeated measures ANOVAs were calculated with time 1 and time 2 behaviours entered as the repeated dependant factor, and the intervention group (with three conditions: positive, negative and control) again entered as the fixed (between-subjects) factor. Further ANCOVAs were computed to test for any co-variation effects of age and gender. It is worthwhile noting here that the error degrees of freedom are reduced due to a lower return rate for health behaviour schedules (tick sheets) at time 2 thus reducing the sample size.

##### ***Healthy Eating Behaviours***

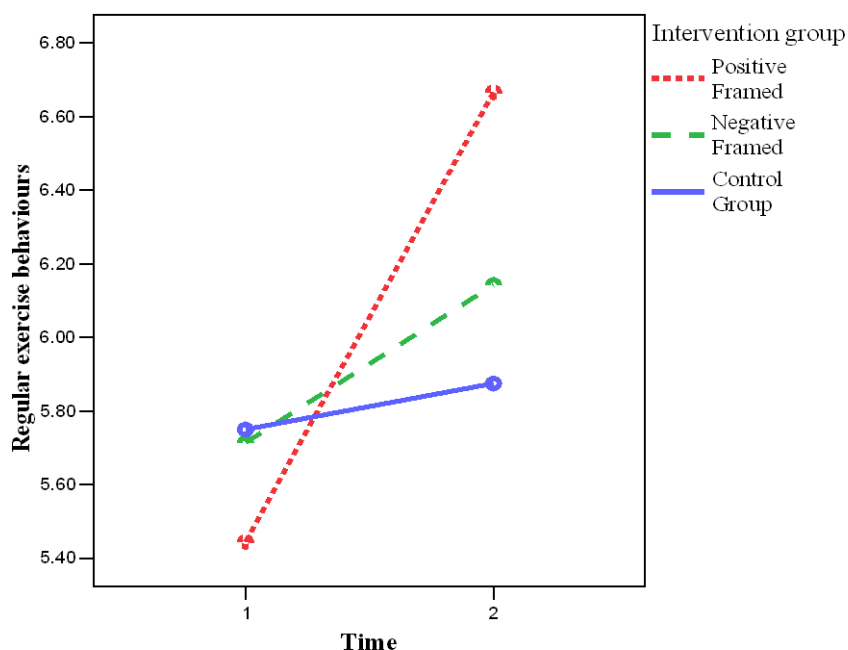
ANOVA revealed a significant interaction effect of the repeated measurement of healthy eating behaviours and the intervention conditions ( $F [2, 38] = 3.84, p < .05$ ). Further analyses found that the main difference in behaviours was seen between the positive condition and the control condition (as presented in Figure 36), however, this mean difference was not significant. When year group and gender were entered as co-variates, the interaction effect of time and intervention was still found to be significant ( $F [2, 36] = 3.62, p < .05$ ). The repeated measurement of time was also found to have a significant main effect ( $F [1, 38] = 12.53, p < .01$ ) confirming that healthy eating increased in the overall sample from time 1 to time 2.



**Figure 36: Interaction effects of intervention condition on healthy eating behaviours**

### ***Regular Exercise Behaviours***

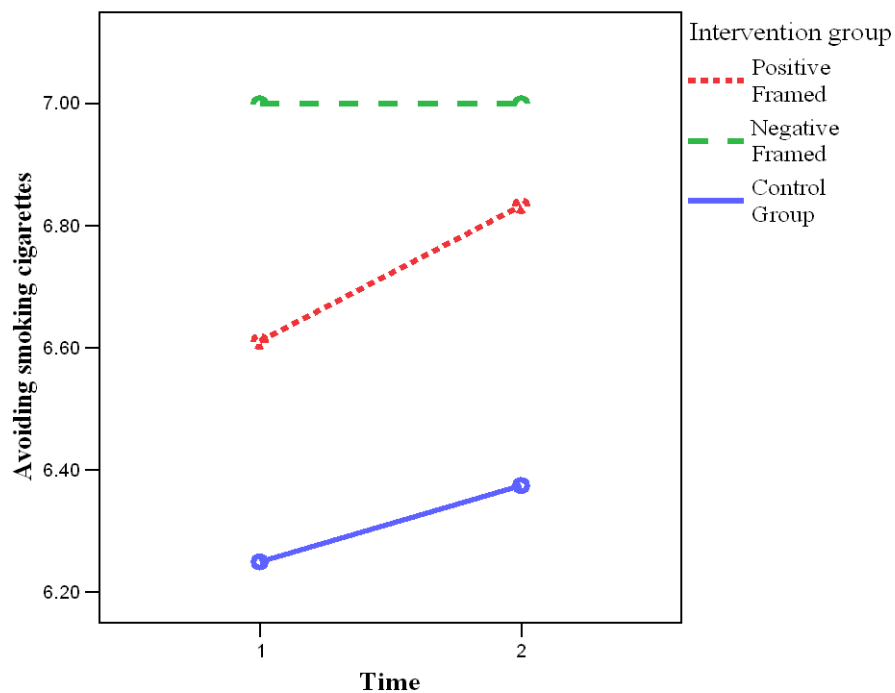
Contrary to the impression from Figure 37, there was no significant interaction effect between the repeated measurements factor and intervention group ( $F [2, 37] = 2.42, p > .05$ ). Main effects of time on exercise behaviours were found to be significant ( $F [1, 37] = 7.08, p < .01$ ) confirming that regular exercise increased in the overall sample from time 1 to time 2. Results from a further ANCOVA revealed that when year group and gender were entered as co-variates, the interaction effect between the repeated measures factor and intervention group was still insignificant ( $F [2, 35] = 2.21, p > .05$ ). A significant main effect was, however, found with gender ( $F [1, 35] = 7.45, p < .01$ ) suggesting the health behaviours reported in the two time frames are significantly effected by gender.



**Figure 37: Main effects of intervention and time on regular exercise behaviours**

### *Avoiding Smoking Cigarettes*

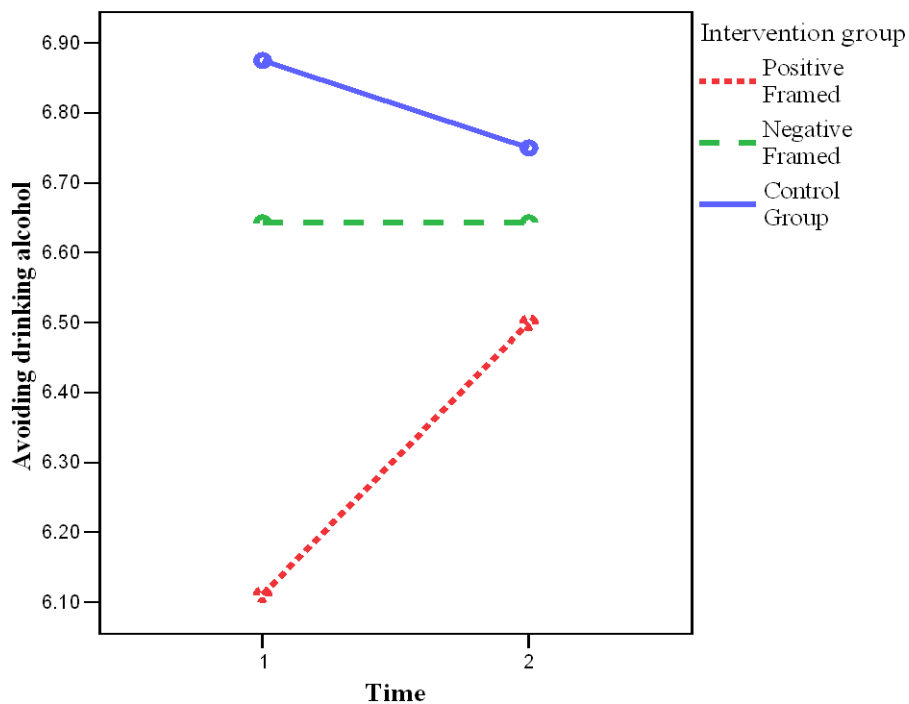
There were no significant main effects on behaviours related to avoiding smoking cigarettes between the three intervention conditions ( $F [2, 37] = .45, p > .05$ ), contrary to the impression given by Figure 38. Additionally, no significant influence was identified when year group and gender were entered as co-variables ( $F [2, 35] = .47, p > .05$ ). Nor were there significant main effects of the repeated measurements of time ( $F [1, 37] = 1.11, p > .05$ ) or intervention group ( $F [2, 37] = .89, p > .05$ )



**Figure 38: Main effects of intervention condition on non-smoking behaviours**

### *Avoiding Drinking Alcohol*

There were no significant main effects found on behaviours related to avoiding drinking alcohol between the three intervention conditions ( $F [2, 37] = 2.10, p > .05$ ). Figure 39 suggests there is an interaction, however, even when year group and gender were entered as co-variates, it was not found to be significant ( $F [2, 35] = 1.82, p > .05$ ). There were no significant main effects reported for the repeated measurements of time ( $F [1, 37] = .60, p > .05$ ) nor intervention group ( $F [2, 37] = 1.96, p > .05$ ).



**Figure 39: Main effects of intervention condition on non-alcohol drinking behaviours**

### *Summary*

A significant interaction was found between the repeated measurement factors and intervention conditions for healthy eating behaviours. There were, however, no interactions revealed between these variables for behaviours relating to exercise, avoiding smoking cigarettes and avoiding drinking alcohol.

Further evidence revealed health promotive behaviours were significantly enhanced with time. Both healthy eating behaviours and regular exercise behaviours significantly increased from time 1 to time 2. There was no significant effect of time found in the reported behaviours relating to avoiding cigarettes or alcohol.

The non-significant effect of the intervention workshops and temporal element on behaviours could be due to a number of co-varying factors. However it is also worthy to note that the sample for this study was a group of ‘healthy’ individuals who may show no increase in health behaviours through time, or effect of a health enhancing intervention, as their baseline (time 1) behaviours are already at a ‘healthy’ level. This will be discussed later in the chapter.

### **6.6.5 Intention-Behaviour Relationship**

An important question of study 2 concerned the previously reported intention-behaviour gap. Do children do what they say they intend to do? Regression analyses were used to investigate this question, with the four health behaviours of interest separately entered as the dependant variables in each regression analysis. Possible effects of age and gender were also controlled for with year group entered into the first step of the regression, and gender into the second step, and the independent variable of behavioural intention entered into the third and final step.

As the intentions towards the health behaviours and actual health behaviours were measured at two time points, the intention-behaviour relationship was investigated both before the intervention and after. It is important to note at this point that the interest is now on the predictive relationship between these intentions and behaviour, and not the influence the intervention has on them, as this has been discussed previously. It is also worthwhile noting that the sample size is substantially reduced in the analysis of the intention-behaviour relationship at time 2 for all health behaviours of interest. This is due to the smaller number of

participants engaged in the data collection stage of study 2 at time 2. Full output data from multiple regression analyses can be found on the appended disk.

### ***Intention-Behaviour Relationship ~ Healthy Eating***

Initial correlational analysis produced from the multiple regression revealed that there was a significant positive correlation between intentions to eat healthy foods and the performance of eating healthy foods at time 1 ( $r=.52$ ,  $N=217$ ,  $p<.001$ ) and time 2 ( $r=.57$ ,  $N=42$ ,  $p<.001$ ). Therefore, the higher the intention to eat healthy foods, the more often healthy foods were actually eaten. Results from the multiple regression analysis is presented in Table 36, and includes the standardized beta values for each of the predictor variables at the various stages in the regression.

**Table 36: Results of multiple regression analyses for intention-behaviour relationship for healthy eating (standardized beta and R<sup>2</sup> change values)**

<b>Predictors</b>		<b>Time 1</b>	<b>Time 2</b>
<b>Year group</b>		-.14*	-.00
	<b>Step 1 R<sup>2</sup></b>	<b>.02*</b>	<b>.00</b>
Year group		-.13*	.04
<b>Gender</b>		.08	.17
	<b>Step 2 R<sup>2</sup> change</b>	<b>.01</b>	<b>.03</b>
Year group		-.06	-.05
Gender		-.03	.11
<b>Intention to eat healthy foods</b>		<b>.51***</b>	<b>.56***</b>
	<b>Step 3 R<sup>2</sup> change</b>	<b>.25***</b>	<b>.31***</b>
<b>Year group + gender + intention</b>	<b>Total R<sup>2</sup></b>	<b>.27</b>	<b>.34</b>

\* $p<.05$ ; \*\* $p<.01$ ; \*\*\* $p<.001$

Evidence from the final model of the regression analysis holding year group and gender constant revealed that intentions to eat healthy foods do significantly predict the behaviour of eating healthy foods explaining 25 percent of the variance in the



behaviour at time 1 and 31 percent of the variance at time 2. It can also be seen from the table that there was some negative influence of year group at time 1 ( $R^2$  change = .02), suggesting the younger children exhibited higher levels of healthy eating behaviours. Although, this influence was not significant when entered with gender and behavioural intention, and no significance was evident for year group influence at time 2. The overall models, including year group, gender and intention to eat healthy food accounted for 27 percent of the variance in healthy eating behaviours at time 1 and 34 percent of the healthy eating behaviours at time 2.

### ***Intention-Behaviour Relationship ~ Regular Exercise***

A significant positive correlation was found between intentions to engage in regular exercise and the performance of regular exercise at time 1 ( $r=.23$ ,  $N=210$ ,  $p<.001$ ). However, no significant correlation was found between these variables for time 2 ( $r=.02$ ,  $N=41$ ,  $p>.05$ ). Therefore, as intentions to exercise increased at time 1 so did the actual exercise behaviours. Although, this relationship was not evident at time 2. This may be for one of many reasons such as methodological issues that will be discussed later in the chapter.

Multiple regression results for exercise related intentions and behaviours are presented in Table 37. From this table, further differences between time 1 and time 2 are evident. At time 1, the intention to exercise for 30 minutes everyday for a week is found to significantly predict the performance of exercise behaviours one week on and along with year group and gender explain 10 percent of the variance in this behaviour. At time 2 however, behavioural intention is not found to be a

significant predictor of health behaviour and no significant relationships were found between the variables.

**Table 37: Results of multiple regression analyses for intention-behaviour relationship for regular exercise (standardized beta and R<sup>2</sup> change values)**

Predictors		Time 1	Time 2
<b>Year group</b>		-.13	.12
	<b>Step 1 R<sup>2</sup></b>	<b>.02</b>	<b>.01</b>
Year group		-.15*	.08
<b>Gender</b>		-.20**	-.17
	<b>Step 2 R<sup>2</sup> change</b>	<b>.04**</b>	<b>.03</b>
Year group		-.13	.08
Gender		-.18**	-.17
<b>Intention to regular exercise</b>		.21**	-.02
	<b>Step 3 R<sup>2</sup> change</b>	<b>.04**</b>	<b>.00</b>
<b>Year group + gender + intention</b>	<b>Total R<sup>2</sup></b>	<b>.10</b>	<b>.04</b>

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### *Intention-Behaviour Relationship ~ Avoiding Smoking Cigarettes*

A significant positive correlation was found between intentions to avoid smoking cigarettes and actually avoiding cigarettes at time 1 ( $r = .30$ ,  $N = 205$ ,  $p < .001$ ) and at time 2 ( $r = .61$ ,  $N = 39$ ,  $p < .001$ ). Therefore, intentions for this target health behaviour were predictive of the action showing that the higher the intention to avoid smoking cigarettes, the more likely individuals would actually avoid smoking cigarettes.

Table 38 presents results from the multiple regression analysis. It can be seen that the predictive power of behavioural intention for avoiding smoking cigarettes is stronger at time 2 than at time 1. There is no significant effect of year group on the

avoidance behaviour, however, the intention to avoid smoking cigarettes explains a significant 9 percent of the variance at time 1 and an even greater significant 34 percent of the variance at time 2. With the inclusion of the minimal effects of year group and gender, the final models explain 10 of the variance in avoiding smoking cigarettes at time 1 and 38 percent of the variance in the behaviour at time 2.

**Table 38: Results of multiple regression analyses for intention-behaviour relationship for avoiding smoking cigarettes (standardized beta and R<sup>2</sup> change values)**

Predictors		Time 1	Time 2
Year group		-.11	-.15
	<b>Step 1 R<sup>2</sup></b>	<b>.01</b>	<b>.02</b>
Year group		-.10	-.11
Gender		.05	.16
	<b>Step 2 R<sup>2</sup> change</b>	<b>.00</b>	<b>.03</b>
Year group		-.10	-.11
Gender		.05	.02
Intention to avoid smoking cigarettes		.29***	.60***
	<b>Step 3 R<sup>2</sup> change</b>	<b>.09***</b>	<b>.34***</b>
Year group + gender + intention	<b>Total R<sup>2</sup></b>	<b>.10</b>	<b>.38</b>

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### *Intention-Behaviour Relationship ~ Avoiding Drinking Alcohol*

Intentions to avoid drinking alcohol were also found to correlate positively with self-reported avoidance of alcohol consumption at both time 1 ( $r = .39$ ,  $N = 196$ ,  $p < .001$ ) and at time 2 ( $r = .44$ ,  $N = 40$ ,  $p < .01$ ). Therefore, the higher the intentions toward avoiding drinking alcohol the higher the self-reported avoidance of alcohol. The predictive power of behavioural intentions towards alcohol avoidance also increased from time 1 to time 2 with the final models, controlling for year group and gender

effects explaining 16 percent of the variance in actual alcohol avoidance at time 1 and 23 percent of the variance in the avoidance behaviour at time 2. These findings and the small individual effects of year group and gender are summarized in Table 39 below.

**Table 39: Results of multiple regression analyses for intention-behaviour relationship for avoiding drinking alcohol (standardized beta and R<sup>2</sup> change values)**

<b>Predictors</b>		<b>Time 1</b>	<b>Time 2</b>
<b>Year group</b>		-.16*	-.15
	<b>Step 1 R<sup>2</sup></b>	<b>.03*</b>	<b>.02</b>
Year group		-.16*	-.11
<b>Gender</b>		.08	.19
	<b>Step 2 R<sup>2</sup> change</b>	<b>.01</b>	<b>.04</b>
Year group		-.05	-.05
Gender		.00	.18
<b>Intention to avoid drinking alcohol</b>		.38***	.42**
	<b>Step 3 R<sup>2</sup> change</b>	<b>.12***</b>	<b>.17**</b>
<b>Year group + gender + intention</b>	<b>Total R<sup>2</sup></b>	<b>.16</b>	<b>.23</b>

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001

### *Summary*

Results from regression analyses provide evidence that behavioural intentions predict behavioural action. Behavioural intentions significantly predicted healthy eating behaviours, regular exercise behaviours (at time 1 only), the avoidance of smoking cigarettes, and the avoidance of drinking alcohol. It can be concluded, therefore, that the intention-behaviour gap previously reported for adults is much smaller in children.

## **6.7 Discussion**

*“As is true with many disciplines that involve service to people, the effects of health promotion can be very difficult to evaluate...A primary, and perhaps inevitable, limitation of health promotion is that prevention can be difficult to quantify”*

*(Crosby, Salazar, DiClemente & Wingwood, 2005)*

The above statement rings true when the results from the second study in the current research programme are considered. Although the findings presented are salient to this thesis and the field of health psychology, the limited effect of the intervention workshops are disappointing. There is, however, some comfort in the finding that some health behaviours were higher at time 2 after the intervention workshops, than at time 1, which suggests some phenomenon is occurring. These effects will be discussed in more detail below.

### **6.7.1 Intervention Effects on Health Behaviour Intentions – Hypothesis 1**

The first hypothesis addressed in study 2 concerned the assumption that intentions towards health behaviour could be significantly enhanced by a framed intervention workshop compared to the effects of a control condition. Findings generated from the current research programme, however, failed to support this hypothesis and experimental effects of the intervention workshops designed for study 2 were found to be largely non significant. Therefore, the first hypothesis must be rejected as there was no overall interaction between the repeated measurement factor and the grouping factor for any of the intentions under investigation.

It is important to note at this point that this hypothesis did not distinguish between the two experimentally framed intervention groups in relation to which frame would be the most successful. Reasons for this surround the mixed evidence provided in the current literature. Empirical evidence suggests that in an adult population gain-framed messages are often more successful than loss-framed messages when considering health enhancing practices such as exercise (McCall & Ginis, 2004), smoking avoidance and cessation (Schneider et al., 2001) and sunscreen use (Detweiler et al, 1999). In contrast, evidence reported from a child population found loss-framed communications as the most effective in enhancing healthy eating practices (Bannon & Schwartz, 2006). The paucity of empirical research investigating message framing effects with children adds to the justification of a non-directional hypothesis and limits comparisons of the findings in study 2 to previous research.

Although not reaching statistical significance average changes in behaviour intentions in some cases (e.g. healthy eating intention) seem to indicate a trend in the hypothesised direction with both intervention groups increasing between time 1 and time 2 compared, with no change in controls. It is tempting to speculate at this point that this lack of statistical significance may be due to the small sample size.

### **6.7.2 Intervention Effects on Health Behaviour Performance – Hypothesis 2**

The second research question of study 2 aimed to examine whether an intervention programme based on psychological theories could enhance the actual health behaviours performed by children. Moreover, it hypothesized the use of both positive and negative framed interventions would result in a significant increase in

health behaviour post intervention compared with a control condition receiving contact time with the researcher but no health behaviour intervention.

Results showed the intervention conditions were only successful when addressing the interaction between conditions within healthy eating behaviours pre and post intervention, with post hoc analysis revealing the difference was largest (although not significantly) between the positive and control conditions. The intervention workshops did not, however, have any significant effects on regular exercise behaviour or the avoidance of smoking cigarettes or drinking alcohol. Therefore, the second hypothesis can only be accepted for healthy eating behaviours and must be rejected for the other three health behaviours of interest.

#### ***Additional Post-Hoc Findings***

Further post hoc analysis revealed both health-enhancing intentions and behaviours were significantly enhanced with time. The intention towards and the performance of healthy eating and regular exercise behaviours were found to significantly increase from time 1 to time 2 when the influence of intervention conditions were taken out of the equation. No significant difference found in the reported intentions or behaviours relating to avoiding cigarettes and avoiding alcohol.

The non-significant effect of the intervention workshops and temporal effects found could have occurred due to a number of co-varying factors. It is noted that the sample for this study was a group of 'healthy' young people who may show no increase in health-enhancing behaviours through time, or effect of a health enhancing intervention, as their baseline (time 1) intentions and behaviours are

already at 'healthy' levels. The level of avoidance towards cigarettes and alcohol for example was high at time 1, with a mean score over 6 on a 7-point scale in each of the three intervention conditions. This scale measured each day the behaviour had been avoided. Therefore, only a minimum increase (of under 1 day) could have occurred in the intentions towards and practice of health behaviour avoidance at time 2 using the current instruments. This leads to two salient questions. The first is the suitability of asking questions to individuals of this age range surrounding behaviours they may not have ever experienced. The second is the methodology involved in collecting such responses. In line with previous research examining the area of tobacco and alcohol use (Kurtz & Thornes, 2000; Murray et al, 1983; McNeill et al, 1988) it seems acceptable to ask questions regarding these behaviours to children as young as 11 years old. Furthermore, research suggests that children over the age of 11-12 years are at a developmentally appropriate age to understand and cognitively process behaviours that are salient to health status (Bibace & Walsh, 1980). This then leads to the question of methodology. The lack of standardised instruments to measure children's health perceptions and health behaviours has been discussed in previous chapters and observed by other authors reviewing behaviours in the field (Avenevoli & Merikangas, 2003). The methodology used in the current research programme was described and justified previously in this chapter and in Chapters 3 and 4. Future research should consider issues of methodology carefully and aim for a consensus of measurement in children's health behaviour research.

### **6.7.3 Intention – Behaviour Relationship - Hypothesis 3**

The third hypothesis in the current research programme stated that health behaviour intentions would significantly predict health behaviours. It was assumed that the



higher the behavioural intention given, the higher the performance of that health behaviour. Findings from study 2 support this hypothesis and provide evidence that health behaviour intentions have in most cases in the current research programme predicted health behaviour action. Health behaviour intentions significantly predicted healthy eating behaviours, regular exercise behaviours, the avoidance of smoking cigarettes, and the avoidance of drinking alcohol when measurements were taken from the original sample at time 1. Furthermore, health behaviour intentions significantly predicted health behaviours at time 2, with the exception of regular exercise behaviours. Therefore, it seems the intention-behaviour gap previously reported for adults is much smaller for children.

#### **6.7.4 Limitations to Study 2**

The non-significant effect of the framed interventions could have occurred due to a multitude of factors and generates a platform for discussion of the limitations to study 2. To begin, the subtlety of the manipulation in the message framed intervention may be one limitation that could explain the non significant effects in the current research programme. This limitation is echoed in the literature, with researchers emphasising limitations of the utilisation of message-framing when attempting to integrate the theoretical construct into applied settings (Finney et al., 2002).

Moreover, with any intervention evaluation, the question of ‘treatment fidelity’ arises. Treatment fidelity involves the ‘treatment integrity’ (the extent to which a treatment condition has been implemented as intended) and ‘treatment differentiation’ (whether the treatment conditions differ from one another as

intended) (Moncher & Prinz, 1991). Lack of treatment fidelity may lead to a ‘type 3’ error, whereby an intervention is concluded as ineffective, when in fact it was never implemented (Nigg, Allegrante & Ory, 2002). It is suggested that this may be the case in the current research programme. Study 2 employed standardised dialogues framed in either a positive or a negative way, (as described earlier in the chapter). Furthermore, discussions generated in the intervention conditions were directed toward the intended frame. It is, however, acknowledged that the intervention was novel and perhaps naïve in its predicted effectiveness.

The lack of empirical evidence investigating message framing effects within children and young people created an inevitable limitation for the current study. Without a sound framework of previous research, study 2 generated assumptions based on a generically different population (adults). Future research in the area of message framing effects with children is therefore encouraged. Recent meta-analysis of 47 studies in the area of message framing and the promotion of physical health identified no empirical work with children (Kyriakaki & Orbell, 2006). Furthermore, recent anecdotal communication with one of the leading authors of research in the area of message framing (Alex Rothman) confirmed that work in the area with children is both a neglected and worthy area of future research.

Although effects of the framed interventions were limited to healthy eating behaviours, there was an increase in health-enhancing behaviours (healthy eating and regular exercise) reported from time 1 to time 2. Unfortunately, assumptions of this effect cannot be tested here, as only those engaged in the intervention workshops were measured for their time 2 data, therefore, there is no ‘pure’ control

group to assess a possible ‘Hawthorne’ or contamination effect that may have occurred in the participants who were engaged in the second study. The possible limitation of these effects will now be discussed.

There is little evidence of a ‘Hawthorne’ effect occurring in research with children in health care settings. Furthermore it is argued that the phenomenon, that is suggested to increase participant performance by the mere fact that they are being observed or studied, is an area that requires further investigation, particularly for research work with young children (Diaper, 1990). Evidence of the ‘Hawthorne’ effect in the adult population has shown a small increase in health behaviours such as screening uptake in individuals who were previously sent a questionnaire compared to individuals who were not (O’Sullivan, Orbell, Rakow & Parker, 2004). However no significant difference was found for service uptake at a six month follow-up. With little evidence to support the possibility of a ‘Hawthorne’ effect occurring in children’s health research, only assumptions can be made regarding such an influence in the results of the current research programme.

Furthermore the effectiveness of the intervention conditions may have been confounded by contamination effects. Due to time and resource constraints study 2 was only conducted in one of the four schools included in the research programme. Although random was successful, it is acknowledged that the participants from various intervention conditions may have mixed and discussed their own intervention sessions thus contaminating intervention effects. Moreover the allocation of individuals to the intervention workshops was restricted to a sample from a single setting (school). It could be argued that individuals from this sample

are more likely to share greater similarities in beliefs or behaviours with one another than those from different settings (Foxcroft, Ireland, Lister-Sharp, Lowe & Breen, 2003). These similarities may arise from the communities in which they live, school values and initiatives. As mentioned at the end of Chapter 2, children do not live in a ‘vacuum’ or isolation from external factors. Decisions regarding the health behaviours in the current research programme are most likely to be informed by a multitude of factors including biological and innate forces, psychological cognitions, social influences and environmental variables. To incorporate such a magnitude of variables into field research is untenable, however, it is unrealistic to disregard or fail to acknowledge the wider influence of confounding variables on the main effects found in the current research programme.

## **Chapter 7: Final Discussion and Future Directions**

### **7.1 Summary**

The principal aim of this two-study research programme was to investigate psychological factors that may contribute to health behaviours in children, and their intention to perform them. The investigation focused on healthy eating behaviours, regular physical activity, avoiding smoking cigarettes and avoiding drinking alcohol. In view of the limited empirical evidence from research with children in the literature the current research programme aimed to address the broad questions: “Do children’s health cognitions, health behaviour perceptions, intentions and practices differ between year group and gender?”; “Can children’s health behaviour intentions be predicted by their health cognitions, health behaviour perceptions, their own past experience or performance of the behaviour and their observations of the health behaviours their parents perform?”; “Can an intervention programme based on psychological theories enhance a child’s intentions towards certain health behaviours and their performance of them, and if so what frame of intervention works best?” and finally “Does a child’s intention to perform certain health behaviours predict the health behaviours they actually perform?”.

This final chapter provides a summary of the current research programme, bringing together findings from study 1 and study 2. The main components that have emerged in the literature are examined, and the strongest predictors of health behaviour intention discussed. Furthermore, the relationship between health behaviour intention and health behaviour performance is investigated and the effects of a theoretically-based intervention package discussed. The implications of the

findings to the field of health psychology are subsequently considered and the strengths and weaknesses addressed. The chapter concludes by discussing the emerging issues from this research programme, and highlights directions for future research.

## **7.2 Summary of the Findings of the Current Research Programme**

### **7.2.1 Study 1**

Study 1 examined the cognitive components identified in the literature as the most significant predictors of the intention to perform the target health behaviours. A cross-sectional design was employed to compare differences between two age groups (year 7 and 10) and between boys and girls in an investigation of the strongest predictors of health behaviour intention.

#### **7.2.1.1 Age & Gender Differences**

As predicted study 1 highlighted significant differences in the study variables between year group and gender. Consistent with previous research (Parcel & Meyer, 1978) age-related differences were reported for health locus of control beliefs with younger children possessing lower, more external health locus of control beliefs than the older children. Younger children were found to place a greater value on their own health compared to older children. No differences were found between the age groups for generalized self-efficacy beliefs, however boys were found to hold significantly higher self-efficacy beliefs than girls. Boys also reported a higher (more positive) image of themselves than girls.

### ***Healthy Eating***

An examination of perceptions pertaining to healthy eating revealed that the perceived importance of, and attitudes towards, healthy eating increased with age for girls, however, decreased with age for boys. Moreover, younger children expressed more positive images of people who eat healthily when compared to the older children. The intention to eat healthily was similar between boys and girls in year 7, however differed significantly by year 10. Older girls' intentions remained stable (in respect to those in year 7) while boys' intentions showed a substantial decline with age. Overall, younger children held higher intentions towards health eating compared to older children, as did girls compared to boys.

### ***Regular Exercise***

Perceptions surrounding regular exercise were also dependant on age and gender. Perceived image and self-efficacy beliefs were higher in the younger children and decreased with age. Physical activity practices were similar between the younger boys and girls. However they differed significantly in year 10, with older boys' exercise continuing at a similar level as the younger boys, while older girls' self-reported exercise plummeted. This data supports findings reported in the literature that girls' exercise levels decrease dramatically with age. Intentions to exercise were not significantly influenced by age. However girls reported significantly lower levels of intention towards physical activity compared to boys.

### ***Avoiding Smoking Cigarettes***

The main effect towards avoiding smoking cigarettes was attributed to the difference in outcome expectancy beliefs, in that, the outcome expectancy that avoiding

smoking cigarettes would be beneficial to health was higher in the younger children than older children. Intentions towards the avoidance of cigarettes were high in the younger age group with a non-significant decreasing trend in intentions with age. Gender differences were however significant, with boys intending to avoid smoking cigarettes at a significantly higher level than girls irrespective of age. In addition, consistent with the literature experience of smoking cigarettes significantly increased from year 7 to year 10.

### ***Avoiding Alcohol Consumption***

Alcohol-related perceptions differed significantly between the year groups but not with gender. Younger children were found to hold a significantly lower (more negative) image of a young person who drinks alcohol than that of older children. The importance attributed to avoiding drinking alcohol and attitudes towards such avoidance behaviour were also significantly higher in the younger children than the older children. Additionally, the expectation that avoiding consuming alcohol would be beneficial to health was significantly higher in the younger children, as was the evaluation that this outcome would be a good one. The intention to avoid drinking alcohol was significantly higher in the younger children and decreased with age. Younger children also had significantly less experience of drinking alcohol compared to the older children consistent with previous research.

#### **7.2.1.2 Predicting Health Behaviour Intentions**

Study 1 subsequently examined children's individual cognitions, health behaviour perceptions, their past behaviour performance and their perception of their parents' health behaviours. Drawing on Social Cognitive Theory (Bandura, 1986) and the



Theory of Planned Behaviour (Ajzen, 1985) the overall aim was to investigate the extent these psychological factors could predict children's future intentions towards the target health behaviours. This study proposed two modified theoretical constructs that were created from the components identified from previous models as the most significant predictors of health behaviour intentions. The proposed Modified Social Learning Theory for Children (MSLTc) assumed that the presence of an internal health locus of control, high self-efficacy beliefs, high health value and a favorable personal image all contribute to the formation of a health behaviour intention. The Modified Theory of Planned Behaviour (MTPB) made the assumption that the perceived image of a typical person performing a health behaviour, the perceived importance of the health behaviour on health status, self-efficacy beliefs specific to the health behaviour, and the attitudes, outcome expectancies and outcome evaluations of the performance of the health behaviour all contribute to the prediction of an intention to perform a health behaviour. In addition to these two models, the influence of past behaviour experience and observed parental behaviours were examined for their individual predictive ability.

Findings were reported from a series of multiple regressions testing the predictive ability of the variables in the two proposed theoretical constructs, separately for each of the health behaviour intentions. This was followed by subsequent stepwise regressions in an attempt to decipher the most significant components of each health behaviour intention. The models produced using the stepwise method in the multiple regressions presented factors that have been found in the current research programme to be the strongest predictors of health behaviour intention. Each model explained a higher percentage of the variance in health behaviour intentions

compared with the MSLTc and MTPB examined separately in the initial multiple regression analyses.

Factors that produced the strongest predictive value varied slightly for each of the health behaviours under investigation. Inclusion of factors from the MSLTc in the models were limited to children's health locus of control in relation to healthy eating intentions and personal image in relation to the intentions to avoid alcohol. Generalised self-efficacy and health value were excluded from all models.

From the MTPB behavioural importance was present in all models and is therefore a significant component for any future model. Past behaviour and attitude were both included into three of the four models (with the exception of exercise) and therefore also have an important contribution to the prediction of a health behaviour intention. Outcome expectancy was also included in three of the four models (with the exception of smoking), and seems to also be an important component. Behaviour-specific self-efficacy beliefs were found to be significant predictors of health behaviour intentions in the analyses they were entered into (healthy eating and regular exercise). As behaviour-specific self-efficacy beliefs were excluded from analyses involving the two avoidance behaviours, the ability of this component can only be reported for the health-enhancing behaviours, however, from this analysis it seems to be a component worthy to include in a final model. Observed parental health behaviour was only entered into the model relating to exercise intentions, with the mother's health behaviour being a significant predictor. Finally, behavioural image was included into the model addressing healthy eating intentions and may be a component worthy of being included into a future model.

### **7.2.1.3 Final Models**

The final model for healthy eating intentions accounted for 52 percent of the variance. This includes the influence of year group (2%) and gender (2%). The final model relating to exercise explained 38 percent of the variance in intentions towards exercise behaviours with 2 percent attributed to year group and a further 4 percent explained by gender. The overall model produced for non-smoking intentions explained 36 percent of the variance with only a 1 percent change by year group. The final model explaining intentions to avoid alcohol contributed to 52 percent of the variance. This model was, however, substantially affected by year group, which explained 14 percent of the variance. However, with the removal of the influence of age, it still explained 38 percent of the variance in non-drinking intentions.

Although several age and gender differences were observed, these did not have a significant influence on the overall predictive strength of the final theoretical models. This is with the exception of age on alcohol-related intentions. Study 1 concludes with the proposition of a new theoretical model of Health Behaviour Perceptions that suggests five components that together have been found to be the most significant predictors of children's health behaviour intention in the current research programme. These five components are behavioural importance, past behaviour, behaviour-specific self-efficacy, attitudes and outcome expectancies. The significance of these components supports previous research reported in the literature from studies in both the child and adult population. Although age and gender differences have been observed within these components this model is proposed to be used across all age groups. This is due to the low variance these

demographic variables added to the final models. This is in line with existing theoretical models that are used for a generic adult population, irrespective of individual differences between samples such as gender and age.

The proposed new model does not include four of the cognitive components (children's health locus of control, behavioural image, outcome evaluation and perceived own image) found in the current research programme to be significant predictors of at least one of the health behaviour intentions. Nor does it include observed parental health behaviours. This is due to their lack of continuity in predictive ability and lower levels of R squared change. They may, however, be components worthy of future research in addition to the components proposed within the new theoretical model of health behaviour perceptions to test their predictive strength in a different population.

### **7.2.2 Study 2**

The second study focused on children's intentions towards the health behaviours of interest and the actual health behaviours they performed. It aimed to identify whether a child's intention towards the target health behaviours was a significant predictor of their actual health behaviour. There are a lack of theories that make assumptions past the measure of intention. In light of this the second study aimed to develop and run a series of theoretically based intervention workshops to enhance cognitions salient to promote health behaviours, manipulating the frame of individual workshops to address health behaviours in either a positive or a negative way. The objective was to explore the effectiveness of the intervention workshops

on enhancing the child's intentions to perform the health behaviours (compared to those previously given in study 1) and the health behaviours they perform.

Using a sub-sample of study 1, the second study followed the children through several time-lines, measuring first their behavioural intention and then their actual behaviour performance one week on. These measurements were taken before and after an experimental intervention workshop designed specifically for the age groups in the research programme. Children were randomly allocated to one of three intervention conditions that were framed either positively or negatively, with an additional control group.

#### **7.2.2.1 Intervention Effects**

Findings from study 2 revealed intervention conditions were only successful when addressing the interaction between conditions within healthy eating behaviours pre and post intervention, with post hoc analysis revealing the difference was largest (although not significantly) between the positive and control conditions. The intervention workshops did not, however, have any significant effects on regular exercise behaviour or the avoidance of smoking cigarettes or drinking alcohol. Health behaviour intentions were also not found to be significantly influenced by the intervention conditions.

In addition to these findings, further post hoc analysis revealed health-enhancing intentions and behaviours significantly increased with time. The intention to engage in healthy eating and regular exercise behaviours were found to significantly

increase from time 1 to time 2 when the influence of intervention conditions were controlled for. There was no significant difference found in the reported intentions or behaviours relating to avoiding cigarettes and avoiding alcohol.

#### **7.2.2.2 Intention – Behaviour Relationship**

Study 2 rested on the assumption that the higher the behavioural intention, the higher the performance of that health behaviour would be one week on. Findings from this study support this hypothesis and provide evidence that behavioural intentions have in most cases in the current research programme predicted behavioural action. Behavioural intentions significantly predicted healthy eating behaviours, regular exercise behaviours, the avoidance of smoking cigarettes, and the avoidance of drinking alcohol when measurements were taken from the original sample at time 1. Three of the four health behaviours were also significantly predicted by health behaviour intentions in measurements taken at time 2. This is with the exception of exercise behaviours. It can therefore be concluded that in most cases intentions towards health behaviours can significantly predict health behaviour performance.

### **7.3 Implications of Findings to the Field of Health Psychology**

The findings generated from the current research programme provide a platform for further investigations in the relationship between children's perceptions of health behaviours, health cognitions, behavioural intentions and health behaviours. Insight has been provided by this research into the most significant predictors of a child's

intention to perform health behaviour and the extent to which such intentions can predict behaviour performance.

Moreover, this research provides evidence of differences between age and gender within many of the common components included in widely used theoretical constructs in the area of health psychology in a child population. The salient objective of this thesis was not to test previous theories, but instead to test components of these theories demonstrated in previous studies to be significant predictors of health behaviour intentions in an attempt to construct a set of cognitive components that together predict the health behaviour intentions of children.

The main findings from study 1 suggest there are age and gender differences in the psychological components of children that could have implications for their future health status. Younger children held lower, more external health locus of control beliefs and placed a greater value on their health compared to the older children. This was expected and may be an implication of the younger children's reliance on others (external) such as their parents or teachers with regards to their health outcomes. It may also be evidence of a transition to greater health-related independence in older children. Internal locus of control has been associated with greater knowledge of disease (Wallston et al, 1976; Tinsley, 1992). Development of health and illness concepts throughout childhood imply a transition through age of conceptions of the nature of health and illness, leading to the acquisition of a belief that health outcomes may be controllable through individual behaviour. This may also explain the increase in locus of control beliefs with age. Boys were found to hold significantly higher self-efficacy beliefs than girls suggesting boys have a

greater belief in their ability to control personal action. Furthermore, boys reported a higher (more positive) image of themselves than girls. From these findings it is concluded that younger children hold more external locus of control beliefs and have a higher health value than older children, and that boys hold higher self-efficacy beliefs and higher image beliefs than girls.

### **7.3.1 Healthy Eating Research**

With regards to healthy eating behaviours, the fact that cognitions such as attitude and image are increasing with age for girls is welcomed as this may in turn have a greater effect on female healthy eating intentions. However, the decline in these cognitions in boys may in turn lead to a down turn in behavioural intention. Results reported here support this notion as boys' intentions to eat healthy foods were seen to decline with age. Overall girls' intentions towards healthy eating were significantly higher than boys. Younger children also held higher intentions towards the behaviour compared to older children. These findings suggest that salient health behaviour cognitions and healthy eating intentions are higher in younger children and in females.

### **7.3.2 Regular Exercise Research**

Findings relating to regular exercise in the current research programme suggest that cognitions, found in the literature to be significant predictors of health behaviour, are significantly higher in the younger children. The younger age group were found to hold a more positive image of people who exercise on a regular basis. Their self-



efficacy beliefs were also much higher suggesting they believe they are more capable of performing regular exercise. Perceived self-efficacy has frequently been reported as a strong predictor for health behaviours and behavioural intentions (Weiss, Wiese & Klint, 1989; Dzewaltowski et al, 1990) as discussed in Chapter 3. These findings therefore again suggest cognitions salient to health behaviour intentions decrease with age. Moreover, data revealed that past exercise behaviours decrease with age for girls supporting findings reported in the literature (Misra & Aguillion, 2001; Kurtz & Thornes, 2000) that the exercise levels of girls decrease dramatically with age. Exercise behaviours are reported to be related to self-efficacy beliefs (Cavill et al, 2001). Data from the current research programme has already confirmed that boys hold significantly higher self-efficacy beliefs than girls, which may provide one explanation for this decline. In relation to behavioural intention, girls again reported significantly lower levels of intention towards physical activity for the week after study 1 compared to boys. These intentions were not however significantly influenced by age.

### **7.3.3 Cigarette Smoking Research**

Outcome expectancies were found to be higher in younger children with regards to their intentions to avoid smoking cigarettes. Previous research has repeatedly found outcome expectancies to be significant predictors of (or part of a component such as attitude that can significantly predict) behavioural intention (McEachan et al, 2005; Schwarzer & Fuchs, 1995; Floyd, Prentice-Dunn & Rogers, 2000; Milne, Sheeran & Orbell, 2000). Therefore, the fact that this perception towards health behaviour decreases with age is a possible area of concern for health professionals. Findings

from the current research programme can inform future research focusing on cigarette smoking of the salience of this cognition. Both boys and girls in year 7 were found to have very similar high intentions towards the avoidance of smoking cigarettes, and there was a trend that showed that this intention decreased with age. Gender differences were significant, with boys intending to avoid smoking cigarettes at a significantly higher level than girls irrespective of age. In addition, consistent with the literature (Kurtz & Thornes, 2000) experience of smoking cigarettes significantly increased with age.

#### **7.3.4 Alcohol Research**

Results examining alcohol-related behaviours identified significant differences between younger and older children suggesting age is an important factor. Younger children held significantly lower (more negative) images of young people who drink alcohol. They believed avoiding alcohol was more important to their health status than older children and their attitudes and expectancy beliefs were also significantly higher. Data suggests that it is the younger children who express more 'health-enhancing' perceptions, showing less idolization of under-age drinkers, stronger attitudes towards avoiding alcohol consumption and a greater belief in the importance and expectancy that avoiding the behaviour will be beneficial to health. Furthermore the intention to avoid drinking alcohol was significantly higher in the younger children. Finally, consistent with previous research (DoH, 2004c; Kurtz & Thornes, 2000) the younger children also had significantly less experience of drinking alcohol compared to the older children.

### **7.3.5 Summary**

With evidence that younger children are instilled with more positive cognitions and perceptions, that have been found in previous research to be salient for health-enhancing behaviours, it seems that from the age of 11 to 12 years there is a need for health professionals to attempt to maintain these cognitions and beliefs through to adolescence and young adulthood in an attempt to promote and maintain good health. It could be argued that the reported decline in beliefs of the importance and expected outcome of the target health behaviours towards health status may be a transition towards a greater level of unrealistic optimism that has been found in young people (Greening et al, 2005; Gochman, 1987). The decline in behaviour-specific self-efficacy beliefs could be attributed to a multitude of factors that may be related to perceived barriers (such as time or peer pressure). It is beyond the scope of this research programme to investigate possible causes of the differences between younger and older children and boys and girls in their health behaviour perceptions and cognitions. However, due to the differences found here it is an area that should receive future consideration.

### **7.4 Limitations of the Research Presented in this Thesis**

The conceptual and methodological approach adopted in this study was described in previous chapters. Nonetheless, several limitations of the studies need to be acknowledged. The first issue is the choice of methodology. The study adopted a cross-sectional design and utilized self-report measures. This type of design, although widely used within empirical research (Avenevoli & Merikangas, 2003), is often subject to criticism (Manfredo & Shelby, 1989). The findings in relation to

gender and age related differences are therefore questionable due to the use of different samples when measuring these categories. The use of self-report data may also be limited due to individual recall and accuracy. The current research programme has attempted to minimize the limitation of recall by restricting the questions to a relatively short period of time (i.e. think back over the last week/ two weeks). The time line between the collection of data relating to behavioural intention, and actual behaviour performance was one week which seemed appropriate given the time constraints of the studies and the fact that such a time frame had been adopted by previous researchers in work on predictors of exercise behaviour (Norman, Boer & Seydel, 2005). It was hoped the assurance of anonymity would minimise questions answered inaccurately. This assumption was based on previous research that suggests if anonymity is guaranteed fully, valid responses of socially proscribed behaviours are likely even among young adolescents providing self-reports of drug use (Murray & Perry, 1987). There is always a possibility, however, that the children's self-reported data may have been affected by social desirability bias. Social desirability bias is a term used to describe an overestimation of desirable behaviours and traits and an underestimation of undesirable behaviours and traits (Dadds, Perrin & Yule, 1998). Effects of social desirability bias have been found in studies with children identifying overestimates in behaviour such as physical activity and diet (Klesges, Baranowski, Beech, Cullen, Murray, Rochon & Pratt, 2004).

A further limitation of the studies relates to the representative nature of the samples utilised. The children who responded to the research programme were restricted to those who provided parental consent, and who wished to engage in the research

programme. Results may therefore reflect only the ‘willing’ individuals in the local community, and may therefore be unrepresentative. It would not, for example, have included ‘at risk’ or ‘hard to reach’ children who are often absent from school. This is one limitation when attempting to generalise the findings presented in this thesis to the wider community and public health. The sample were also drawn from non-clinical settings. Therefore participants were assumed to be from a ‘healthy’ community. This assumption cannot, however, be tested as data measuring the current health status of participants was not collected. This yields a further limitation to the investigation in relation to study 2. The limited effects of the intervention conditions and the non-significant change in the avoidance health behaviours over time may simply be a reflection of the fact that the population under investigation were already exhibiting high levels of health protective behaviours and, taking into account the measurements used, may already be performing at an optimum level.

The lack of a ‘pure’ control group limited the conclusion that could be drawn from study 2. Insignificant effects of the framed intervention conditions compared to the control condition may be a result of extraneous factors such as the ‘Hawthorne’ effect or cross-contamination. The issue of the ‘Hawthorne’ effect is one of great complexity. Future research may wish to conduct a more rigid experimental design to examine ‘Hawthorne’ effects. It could be argued that such effects may be of benefit to public health campaigns aiming to enhance health behaviours such as healthy eating. Conclusions related to this effect could suggest the perception of being ‘chosen’ to be in a health enhancing study, and subsequent interaction focusing on health behaviours is sufficient to enhance such behaviours.

A further limitation perhaps *to* rather than *of* the current research programme was the lack of current relevant empirical research in the area of children's health perceptions and health behaviours. There are several studies however reported within this research programme that were published after the date methodological decisions had been made regarding the current study. Woods et al's work investigating children's understanding of passive smoking was published in 2005 for example. Similarly Greening et al's findings of low negative health experience and low perceived health threat was also published in 2005. The most relevant piece of research to be recently published is that of Lohaus et al (2004) who examined the prediction of health-related behaviour in school-aged children. Other work investigating how children perceive behaviours relevant to health status are dated, with much work conducted in the 1980's such as that of Bibace and Walsh (1980), Kister and Patterson, (1980) and Brewster (1982).

There is no universally accepted definition of health and what constitutes a health perception in the current literature. There seemed, therefore, a need to create a link between the theoretical frameworks such as those included in this thesis. However, literature incorporating the previously discussed theoretical models in the realms of children's health perceptions and health behaviours were also limited, creating a limitation for the current research programme that then had to explore the assumptions of these models developed for an adult population. Of those studies using these models on a child populations, it is noted that these are dated. It is hoped that publications that follow from the current research programme can build on the recent work published in the area, such as Lohaus et al (2004) and Greening et al (2005), and add to a foundation for future research investigating social cognitive

factors specifically relevant for the child population. This would be salient research within the health care system to date considering the increasing levels of childhood obesity and links between health behaviours in childhood, obesity and adult health problems such as coronary heart disease and cancer.

The lack of standardized instruments in health behaviour studies with children has been noted previously as a major limitation to research (Avenevoli & Merikangas, 2003). The deficiency of empirical research incorporating social cognition models within the child population created further limitations that ultimately led to the development of an instrument specifically designed to collect information relevant to such models in this study. Although it could be argued that this is one of the original contributions of this thesis, it is not without its limitations. The exclusion of behaviour-specific self-efficacy questions relating to smoking and alcohol use is one example of the limitations of using a newly developed instrument. It is assumed here that this question in the Health Perceptions Questionnaire was misinterpreted and therefore answered incorrectly. If the HPQ were to be used again in the future, the format of these questions would need to be addressed and include clear instructions. The reliability of the questionnaire as a whole is also questionable, as for the current research programme the reliability of each section was tested as opposed to the HPQ as a single instrument. This was due to the variety in questions and response formats that reflected the standardized tools each section was based upon. It may, therefore, be more viable for the HPQ to be referred to as a 'package' of instruments, each scoring relatively high in the current research programme for internal reliability, that together measure the main theoretical components of interest in the current research programme.

The non-significant effect of the intervention workshops and the positive effects of time observed could have occurred due to a number of factors. It was noted at the end of Chapter 6 that the sample for this study was a cohort of 'healthy' young people who may show no increase in protective health behaviours through time, or be effected by a health enhancing intervention, as their baseline (time 1) intentions and behaviours were already at a optimal level. This led to two salient questions surrounding the suitability of the measurements used and the methodology of collecting such data in the current research programme. It was concluded that questions included in the HPQ were in line with those used in previous research and are cognitively and socially acceptable questions to ask the children of the ages in the current research programme. The lack of standardised instruments to measure children's health perceptions and health behaviours have been discussed in previous chapters and observed by other authors reviewing behaviours in the field (Avenevoli & Merikangas, 2003). The methodology used in the current research programme was described and justified previously, although, it is noted that future research should consider issues of methodology carefully and aim for a consensus for measurement in children's health behaviour research.

### **7.5 Emerging Issues and Directions for Future Research**

This thesis has identified a number of key issues relevant in the identification of children's health behaviours and health promotion. Future research could seek to conduct more focused investigations based of the findings presented in the two studies described here.



This research has highlighted associations between cognitive factors and health behaviour intentions. Furthermore, an attempt has been made to examine the ways in which these cognitive factors interact, with an examination of the strongest predictors of health behaviour intention. In order to accomplish this, the current research programme utilised multiple regression analysis. Acknowledged as a valuable statistical tool, multiple regression analyses were deemed the most appropriate method of analysis to address the hypotheses of the research programme. This technique does, however, have its limitations as it only allows for the investigation of a single relationship at any one time. Future research would benefit from the use of structural equation modelling techniques in order to investigate a more complex set of hypotheses.

Future research could further investigate whether interventions may benefit from the prior knowledge of children's cognitions and health behaviour perceptions. Although limited effects were found with the framed interventions in the current research programme, health behaviours were significantly increasing from initial contact to time point 2 after some form of contact had been made. Future research may wish to investigate tailored interventions with specific cognitive factors taken into account such as locus of control, self-efficacy or behavioural importance. Past behaviour experience may also alter the success of health promotion interventions. It could be assumed that a child with an external locus of control, low self-efficacy or a low health value would need a completely different intervention to one who has an internal locus of control, high self-efficacy and an adequate value on health. From the literature presented in Chapter 3 it is plausible to assume that the child with an external locus of control and low self-efficacy beliefs may not comply with

health promotive advice as they may believe that it is neither in their control nor their responsibility to enhance their health. Recent reports by the American Psychological Association (2006) supports this assumption for the adult population suggesting tailored messages should attend to individual differences in health information processing styles in three domains. These domains are described as; (1) the need for cognition (i.e. the tendency to go over things in the mind) (Cacioppo, Petty, Feinstein & Jarvis, 1996); (2) health locus of control (Wallston et al, 1978); and (3) monitoring and blunting styles (i.e. the tendency to seek or avoid health information) (Miller, 1987). Furthermore, message-framed interventions tailored to such individual differences have been found to significantly enhance the persuasiveness of health-relevant (mammogram) communication when stratified for psychological cognitions such as health locus of control (Williams-Piehota, Schneider, Pizarro, Mowad & Salovey, 2004). Unfortunately, due to time constraints and access to the school years under investigation, the use of stratified, tailored interventions was not possible in the current research programme. This was further confounded by the relatively small sample size attributed to the second ‘intervention’ study. Although the question of the effectiveness of tailored interventions was not one addressed in this thesis, it is a question of great interest and worthy of further investigation. With knowledge of health cognitions and perceptions of health behaviours, interventions can be designed to effectively work with these perceptions. This research programme has provided evidence of the difference in such cognitions within both age and gender. It was beyond the scope of this thesis to investigate any effects prior cognitive factors may have had on the outcome effects of the intervention workshops. This is, however, a further area worthy of future research.

Future research may also wish to consider a more focused investigation of the influence of parental health behaviours in both behavioural intention formation and behaviour performance. In addition to the child's perceptions of health behaviours, preconceptions regarding health behaviours are also highly important. This study has hypothesised that these develop primarily in response to exposure to health behaviours in the family home. Such prior knowledge and experience may also guide the success of an intervention programme. It could be argued that a child who has witnessed poor health behaviours at home, for example through their parents smoking, drinking to excess, and/or poor eating habits, and the negative effects of these habits, such as obesity, chesty coughs, and alcohol-related behaviour (such as sickness and violence), may be more aware of the 'unpleasantness' of these behaviours than a child who has not observed them at home. This may in turn effect or guide the success of a tailored intervention programme.

## **7.6 Conclusions**

This thesis has made a number of significant and original contributions to knowledge in the field of child health psychology. The behaviour and lifestyles that young people adopt are a topical national focal point in health behaviour literature. From the epidemiological shift of the leading causes of death that have been witnessed over the last few decades, governmental policies within the UK now have a heavy focus on prevention through the reduction of behavioural risk factors. Treating ill health is expensive for the UK government. Heart disease, stroke and related illnesses cost the National Health Service (NHS) an estimated £3.8 billion every year (DoH, 1998). Behavioural risk factors of such illnesses include smoking, misuse of alcohol, a poor diet and physical inactivity. These behaviours, as reported

in Chapter 2, are becoming an increasing concern in childhood. By preventing avoidable illnesses through the modification of behavioural risk factors money can be concentrated on resources for treating conditions which cannot yet be prevented. The current research programme seems therefore to be both a worthy and timely investigation. It hopes to have provided an insight into cognitive factors that influence children's decisions to engage in health behaviours that have been found to have an influence on health status throughout life.

Late childhood and adolescence are reported as the developmental period when habitual health behaviours are formed (Curtis, 1992). This is also the age when young people begin to develop beliefs salient to health promotion (Maddux et al, 1986). The apparent gap between health behaviour and health consequences for children, coupled with their low value on health and perceived vulnerability of illness (Gochman, 1987) suggests an important time in the child's developmental trajectory to investigate cognitive factors that may influence health behaviour decision making. In doing this, it is first important to establish how a child's perception of health develops and what cognitions are significant in the prediction of health behaviours.

The current research programme has provided insight into age-related and gender differences in the components most commonly reported in the literature as significant predictors of health behaviour intention. Findings have also revealed that children's intentions towards certain health behaviours are significant predictors of the health behaviours they actually perform. These findings expand the current empirical research which at present is dated to the extent that it does not reflect the

challenges that young people face today. It seems evident that future research and public health interventions that aim to increase or maintain children's health-enhancing behaviours and prevent or reduce children's health-impairing behaviours would benefit from the knowledge of the findings presented in this thesis.

## References

- Abraham, C. & Michie, S. (2005). Towards a healthier nation. *The Psychologist*, 18, (11), 670-671.
- Abraham, C. & Sheeran, P. (2005). *The Health Belief Model*. In M. Conner & P. Norman (Eds.) *Predicting Health Behaviour. 2<sup>nd</sup> Edition*. Berkshire: Open University Press, 28-80.
- Abraham, C., Sheeran, P., Norman, P., Conner, M., De Vries, N. & Otten, W. (1999). When good intentions are not enough: Modeling post-intention cognitive correlates of condom use. *Journal of Applied Social Psychology*, 29, 2591-2612.
- Acheson, D. (1988). *Public Health in England: The Report of the Committee of Inquiry into the Future Development of the Public Health Function*. London: HMSO.
- Ajzen, I. (1985). *From Intentions to Action: A Theory of Planned Behaviour*. In J. Kuhl & J. Beckham (Eds.) *Action Control: From Cognitions to Behaviour*. New York: Springer-Verlag, 11-39.
- Ajzen, I. (2002). Perceived behavioural control, self-efficacy, locus of control, and the theory of planned behaviour. *Journal of Applied Social Psychology*, 32, 1-20.
- American Psychological Association. (2006). *To Motivate Healthy Behaviour, It's Often Not What You Say, But How You Say It*. Washington, DC: APA.
- Avenevoli, S. & Merikangas, K. R. (2003). Familial influences on adolescent smoking. *Addiction*, 98, 1-20.

- Backett, K. & Alexander, H. (1991). Talking to young children about health: Methods and findings. *Health Education Journal*, 50, 34-38.
- Bandura, A. (1977a). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1977b). Self-efficacy: Towards a unifying theory of behavioural change. *Psychological Review*, 84 (2). 191-215.
- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1992). *Self-efficacy Mechanism in Psychobiologic Functioning*. In R. Schwarzer (Ed.). *Self-efficacy: Thought Control of Action*. Washington, DC: Hemisphere, 355-94.
- Bandura, A. (1994). *Self-efficacy*. In V. S. Ramachaudran (Ed.) *Encyclopaedia of Human Behaviour*. (Vol. 4). New York: Academic Press, 71-81.
- Bannon, K. & Schwartz, M. B. (2006). Impact of nutrition messages on children's food choice: Pilot study. *Appetite*, 46, (2), 124-129.
- Barton, J., Chassin, L., Presson, C. & Sherman, S. J. (1982). Social image factors as motivators of smoking initiation in early and middle adolescence. *Child Development*, 53, 1449-1511.
- Becker, M. H. (1974). The Health Belief Model and sick role behaviour. In M. Conner & P. Norman (1995). (Eds.) *Predicting Health Behaviour*. Buckingham: Open University Press.
- Becker, M. H., Haefner, D. P. & Maiman, L. A. (1977). The health belief model in the prediction of dietary compliance: A field experiment, *Journal of Health and Social Behaviour*, 18, 348-366.
- Belloc, N. (1973). Relationship of health practices and mortality. *Preventive Medicine*, 2, 67-81.

- Bengel, J., Bucherer, G., Strittmatter, R. & Buggle, F. (1995). Die Entwicklung von subjektiven Gesundheitskonzepten-Ein Überblick zur Forschungslage bei Kindern und Jugendlichen. *Zeitschrift für Gesundheitspsychologie Band III, 4*, 241-254.
- Bennett, P., Moore, L., Smith, A., Murphy, S. & Smith, S. (1994). Health locus of control and value of health as predictors of dietary behaviour. *Psychology and Health, 10*, 41-54.
- Bennett, P., Norman, P., Murphy, S., Moore, L. & Tudor-Smith, C. (1998). Beliefs about alcohol, health locus of control, value for health and reported consumption in a representative population sample. *Health Education Research, 13*, 25-32.
- Bennett, P. & Murphy, S. (1997). *Psychology and Health Promotion*. Buckingham: Open University Press.
- Beverly, B. I. (1936). The effects of illness on emotional development. In J. R. Hergenhather & M. Rabinowitz (1991). Age-related differences in the organisation of children's knowledge of illness. *Developmental Psychology, 27*, 952-959.
- Bibace, R. & Walsh, M. E. (1980). The development of children's conceptions of illness. *Pediatrics, 66* (6), 912-917.
- Biddle, S., Cavill, N. & Sallis, J. (1998). *Policy Framework for Young People and Health-Enhancing Physical Activity*. In S. Biddle, N. Cavill & J. Sallis (Eds.) *Young and Active*. London: Health Education Authority, 3-16.



- Biddle, S. J. M., Gorely, T. & Stensel, D. J. (2004). Health-enhancing physical activity and sedentary behaviour in children and adolescents. *Journal of Sport Sciences*, 22, 679-701.
- Birch, L.L., Zimmerman, S. & Hind, H. (1980). The influence of social affective context on preschool children's food preferences. *Child Development*, 51, 856-861.
- Bosma, H., Van de Mheen, H. D. & Mackenbach, J. P. (1999). Social class in childhood and general health in adulthood: Questionnaire study of contribution of psychological attributes. *British Medical Journal*, 318, 18-22.
- Breslau, N. & Peterson, E. L. (1996). Smoking cessation in young adults: Age at initiation of cigarette smoking and other suspected influences. *American Journal of Public Health*, 86, 214-220.
- Breslow, L. & Enstrom, J. E. (1980). Persistence of health habits and their relationship to mortality. *Preventive Medicine*, 9, 469-483.
- Brewster, A. B. (1982). Chronically ill hospitalised children's concepts of their illness. *Pediatrics*, 69, (3), 355-362.
- British Heart Foundation (1998). *Intake*. London: Comic Company.
- British Heart Foundation (2000). *Heartworks*. London: BHF.
- British Heart Foundation (2003). *HACK: An A-Z of Things You Always Wanted to Know About Smoking But Were Too Hacked to Ask*. London: Comic Company.
- British Heart Foundation (2004). *Be Active!* London: Comic Company.
- Brownell, K. D. (1991). Personal responsibility and control over our bodies: When expectation exceeds reality. *Health Psychology*, 10, 303-310.

- Cacioppo, J. T., Petty, R. E., Feinstein, J. A., & Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin*, *119*, 197-253.
- Camp, D. E., Klesges, R. C. & Relyes, G. (1993). The relationship between body weight concerns and adolescent smoking. *Health Psychology*, *12*, (1), 24-32.
- Cavill, N., Biddle, S. J. H. & Sallis, J. F. (2001). Health enhancing physical activity for young people: Statement of the United Kingdom Expert Consensus Conference. *Pediatric Exercise Science*, *13*, 12–25.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, *39*, 752-6.
- Chaput, J. P., Brunet, M. & Tremblay, A. (2006). Relationship between short sleeping hours and childhood overweight/obesity: Results from the ‘Québec en Forme’ Project. *International Journal of Obesity*, *30*, 1080-1085.
- Charlton, A. & Blair, V. (1989). Predicting the onset of smoking in boys and girls. *Social Science and Medicine*, *29*, 813-818.
- Chassin, L., Presson, C. & Rose, J. (2005). Parenting Style and Smoking-Specific Parenting Practices as Predictors of Adolescent Smoking Onset. *Journal of Pediatric Psychology*, *30*, (4), 334-344.
- Chassin, L., Presson, C., Sherman, S. J., Corty, E. & Olshavsky, R. W. (1981). Self-images and cigarette smoking in adolescence. *Personality and Social Psychology Bulletin*, *7*, 670-676.
- Chassin, L., Tetzloff, C. & Hershey, M. (1985). Self-image and social-image factors in adolescent alcohol use. *Journal of Studies in Alcohol*, *46*, 39-47.

- Clark, L. F. (1994). *Social Cognition and Health Psychology*. In R. S. Wyer, Jr. & T. K. Srull (Eds.). *Handbook of Social Cognition*. Hillsdale, N. J.: Erlbaum, 239-288.
- Clark, P. I., Scarisbrick-Hauser, A., Gautam, S. P. & Wirk, S. J. (1999). Anti-tobacco socialisation in homes of African-American and white parents, and smoking and non-smoking parents. *Journal of Adolescent Health, 24*, 329-339.
- Conner, M. & Norman, P. (Eds.) (1995). *Predicting Health Behaviour*. Buckingham: Open University Press.
- Conner, M. & Norman, P. (Eds.) (2005). *Predicting Health Behaviour (2<sup>nd</sup> Edn.)* Berkshire: Open University Press.
- Conner, M. & Sparks, P. (1995). *The Theory of Planned Behaviour and Health Behaviours*. In M. Conner & P. Norman (Eds.) *Predicting Health Behaviour*. Buckingham: Open University Press, 121-162.
- Cox, B. D. (1987). *The Health and Lifestyle Survey: Preliminary Report*. London: The Health Promotion Trust.
- Croll, J. K., Neumark-Sztainer, D. & Story, M. (2001). Healthy eating: What does it mean to adolescents. *Journal of Nutrition Education, 33*, 193-198.
- Crosby, R., Salazar, L., DiClemente, R., & Wingood, G. (2005). *Overview of Health Promotion*. In J. Kerr, R. Weitkunat & M. Moretti (Eds.) *ABC of Behaviour Change: A Guide to Successful Disease Prevention and Health Promotion*. London: Elsevier Ltd, 3-16.
- Curtis, S. (1992). Promoting health through development analysis of adolescent risk behaviour. *Journal of School Health, 62*, (9), 417-420.

- Dadds, M. R., Perrin, S. & Yule, W. (1998). Social desirability and self-reported anxiety in children: An analysis of the RCMAS Lie Scale. *Journal of Abnormal Child Psychology*, 26, 311-317.
- Danielzik, S., Czerwinski-Mast, M. & Langnäse, K. (2004). Parental overweight, socioeconomic status and high birth weight are the major determinants of overweight and obesity in 5-7y-old children: baseline data of the Kiel Obesity Prevention Study (KOPS). *International Journal of Obesity*, 28, (11), 1494-1502.
- DeBono, K. G. & Telesca, C. (1990). The influence of source physical attractiveness on advertising effectiveness: A functional perspective. *Journal of Applied Psychology*, 20, (17), 1383-1395.
- Department of Health. (1992). *The Health of the Nation*. London: HMSO.
- Department of Health. (1992b). *Assessing the Effects of Health Technologies: Principles, Practice, Proposals*. London: HMSO.
- Department of Health. (1995). *Sensible Drinking: The Report of an Inter-Departmental Working Group*. London: HMSO.
- Department of Health. (1998). *Our Healthier Nation: A Contract for Health*. London: HMSO.
- Department of Health. (1999). *Saving Lives: Our Healthier Nation*. London: HMSO.
- Department of Health. (2003). *5 A DAY: Just Eat More (Fruit and Veg)*. London: HMSO.
- Department of Health. (2004). *Choosing Health: Making Healthy Choices Easier*. London: HMSO.
- Department of Health. (2004b). *At Least 5 a Week: Evidence on the Impact of Physical Activity and its Relationship to Health*. London: HMSO.

- Department of Health. (2004c). *Statistics on Alcohol: England, 2004*. London: HMSO.
- Department of Health. (2005). *Choosing a Better Diet*. London: HMSO.
- Department of the Environment, Transport and the Regions (DETR). (1999). *Travel to School*. London: HMSO.
- De Vries, H. (1989). *Smoking Prevention in Dutch Adolescents*. In Kok, G., Den Boer, D., De Vries, H., Gerards, F., Hospers, H. J. & Mudde, A. N. (1992). *Self-Efficacy and Attribution Theory in Health Education*. In R. Schwarzer (Ed.) *Self-efficacy: Thought Control of Action*. Washington, DC: Hemisphere, 245-262.
- De Vries, H., Engels, R., Kremers, S., Wetzels, J. & Mudde, A. (2003). Parents' and friends' smoking status as predictors of smoking onset: Findings from six European countries. *Health Education Research*, 18, (5), 627-636.
- Detweiler, J. B., Bedell, B. T., Salovey, P., Pronin, E. & Rothman, A. J. (1999). Message framing and sunscreen use: Gain-framed messages motivate beachgoers. *Health Psychology*, 18, 189-196.
- Diaper, G. (1990). The Hawthorne effect: A fresh examination. *Educational Studies*, 16, (3), 261-267.
- Dietz, W. H. & Gortmaker, S. L. (1985). Do we fatten our children at the television set? Obesity and television viewing in children and adolescents. *Pediatrics*, 75, 807-812.
- Dixey, R., Sahota, P., Atwal, S. & Turner, A. (2001). Children talking about healthy eating: Data from focus groups with 300 9-11-year-olds. *Nutrition Bulletin*, 26, 71-79.

- Doherty, W. & Allen, W. (1994). Family functioning and parental smoking as predictors of adolescent cigarette use: A six-year prospective study. *Journal of Family Psychology, 8*, (3), 347-353.
- Doll, R. & Peto, R. (1981). The causes of cancer: Quantitative estimates of avoidable risks of cancer in the United States today. *Journal of the National Cancer Institute, 66*, 1191-1308.
- Downie, R. S. & Macnaughton, R. J. (1998). Images of health. *Lancet, 351*, 823-826.
- Duffy, M. E. (1988). Health promotion in the family: Current findings and directives for nursing research. *Journal of Advanced Nursing, 13*, 109-117.
- Dzewaltowski, D. A., Noble, J. M. & Shaw, J. M. (1990). Physical activity participation-Social cognitive theory versus the theories of reasoned action and planned behaviour. *Journal of Sport and Exercise Psychology, 12*, 388-405.
- Eagly, A. H. & Chaiken, S. (1993). *The Psychology of Attitudes*. Fort Worth, TX: Harcourt Brace Javanovich.
- Eaton, L. (2004). UK government announces plan to tackle alcohol. *British Medical Journal, 328*, 659.
- Eiser, C. & Kopel, S. J. (1997). *Children's Perceptions of Health and Illness*. In K. J. Petrie & J. A. Weinman (Eds.) *Perceptions of Health and Illness: Current Research and Applications*. Amsterdam, Netherlands: Harwood Academic Publishers, 47-76.
- Eiser, C., Walsh, S. & Eiser, J. R. (1986). Young children's understanding of smoking. *Addictive Behaviours, 11*, 119-123.

- Eiser, J. R., Eiser, C., Gammage, P. & Morgan, M. (1989). Health locus of control and health beliefs in relation to adolescent smoking. *British Journal of Addiction*, 84, 1059-1065.
- Eiser, J. R., Morgan, M., Gammage, P. & Gray, E. (1989). Adolescent smoking: attitudes, norms and parental influence. *British Journal of Social Psychology*, 28, 193-202.
- Ennett, S. T. & Bauman, K. E. (1994). The contribution of influence and selection to adolescent peer group homogeneity: The case of adolescent cigarette smoking. *Journal of Personality and Social Psychology*, 67, 653-663.
- Evans, D., Head, M. J. & Speller, V. (1994). *Good Practice in Health Promotion: Assuring Quality in Health Promotion*. London: Health Education Authority.
- Faucher, M. A. (2003). Factors that influence smoking in adolescent girls. *Journal of Midwifery and Women's Health*, 48, (3), 199-205.
- Felton, G. M., Parsons, M. A. & Bartoces, M. G. (1997). Demographic factors: Interaction effects on health-promoting behaviour and health-related factors. *Public Health Nursing*, 14, 361-367.
- Finney, L. J. & Iannotti, R. J. (2002). Message framing and mammography screening: A theory-driven intervention. *Behavioural Medicine*, 28, (1), 5-10.
- Fishbein, M. & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behaviour*. New York: Wiley.
- Flick, U. (2000). Qualitative inquires into social representations of health. *Journal of Health Psychology*, 5, 315-324.
- Floyd, D. L., Prentice-Dunn, S. & Rogers, R. W. (2000). A meta-analysis of protection motivation theory. *Journal of Applied Social Psychology*, 30, 407-429.

- Fonagy P, Target M, Cottrell D, Kurtz A, Kurtz Z. (2000). *A Systematic review of the literature on the effectiveness of interventions for Child and Adolescent Mental Health*. New York: The Guilford Press.
- Foster, R. K. & Buttriss, J. (2005). A review of the public health white paper – Choosing Health: Making Healthy Choices Easier. *Nutrition Bulletin*, 30, 70-75.
- Foulds, J. (2000). The new NHS smoking campaign. *British Medical Journal*, 12, (320), 7232.
- Fox, K. R. (2003). Childhood obesity and the role of physical activity. *The Journal of The Royal Society for the Promotion of Health*, 124, (1), 34-39.
- Foxcroft, D. R., Ireland, D., Lister-Sharp, D. J., Lowe, G. & Breen, R. (2003). Longer-term primary prevention for alcohol misuse in young people: A systematic review. *Addiction*, 98, 397-411.
- Franzkowiak, P. (1987). Risk taking and adolescent development. *Health Promotion*, 2, 51-60.
- Galanti, M. R., Rosendahl, I., Post, A. & Gilljam, H. (2001). Early gender differences in adolescent tobacco use – The experience of a Swedish cohort. *Scandinavian Journal of Public Health*, 29, 314-317.
- Gibbons, F. X. & Gerrard, M. (1995). Predicting young adults' health risk behaviour. *Journal of Personality and Social Psychology*, 69, 505-517.
- Gibbons, F., Gerrard, M. & Boney-McCoy, S. (1995). Prototype perception predicts (lack of) pregnancy prevention. *Personality and Social Psychology Bulletin*, 21, 85-93.



- Giskes, K., Patterson, C., Turrell, G. & Newman, B. (2005). Health and nutrition beliefs and perceptions of Brisbane adolescents. *Nutrition and Diet*, 62, 69–75.
- Glynn, L., Emmett, P., Rogers, I. & the ALSPAC Study Team. (2005). Food and nutrient intakes of a population sample of 7-year-old children in the South-West of England in 1999/2000 – What difference does gender make? *Journal of Human Nutrition and Dietetics*, 18, 7-19.
- Gochman, D. S. (1987). *Youngsters' Health Cognitions: Cross-Sectional and Longitudinal Analyses*. Louisville, KY: Health Behaviour Systems.
- Goldberg, J. & Fischhoff, B. (2000). The long-term risks in the short-term benefits perceptions of potentially addictive activities. *Health Psychology*, 19, (3), 299-303.
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, 54, 493-503.
- Gortmaker, S. L., Must, A., Sobol, A. M., Peterson, K., Colditz, G. A. & Dietz, W. H. (1996). Television viewing as a cause of increasing obesity among children in the United States, 1986-1990. *Archives of Pediatrics and Adolescent Medicine*, 150, 356-362.
- Gottlieb, N. H. & Green, L. W. (1984). Life events, social network, lifestyle and health: An analysis of the 1979 national survey on personal health practices and consequences. *Health Education Quarterly*, 11, 91-105.
- Graham, M. V. & Uphold, C. R. (1992). Health perceptions and behaviours of school-age boys and girls. *Journal of Community Health Nursing*, 9, 77-86.

- Green, G., MacIntyre, S., West, P. & Ecob, R. (1991). Like parent like child? Associations between drinking and smoking behaviour of parents and their children. *British Journal of Addiction*, 86, 6, 745-759.
- Greening, L., Stoppelbein, L., Chandler, C. & Elkin, T. (2005). Predictors of children's and adolescent's risk perception. *Journal of Pediatric Psychology*, 30, (5), 425-435.
- Gregory, J. & Lowe, S. (2000). *National Diet and Nutrition Survey: Young People aged 4-18 years*. London: HMSO.
- Grewal, D., Gotlieb, J. & Marmorstein, H. (1994). The moderating effects of message framing and source credibility on the price-perceived risk relationship. *Journal of Consumer Research*, 21, 145-153.
- Hagger, M. S., Chatzisarantis, N. L. D. & Biddle, S. J. H. (2002). A meta-analytic review of the Theories of Reasoned Action and Planned Behaviour in physical activity: Predictive validity and the contribution of additional variables. *Journal of Sport and Exercise Psychology*, 24, 3-32.
- Hardman, A. E. (2001). Physical activity and cancer risk. *Proceedings of the Nutrition Society*, 60, 107-113.
- Hastings, G. & Haywood, A. (1991). Social marketing and communication in health promotion. *Health Promotion International*, 6, (2), 329-343.
- Hawkins, S. S. & Law, C. (2005). Patterns of research activity related to government policy: A UK web based survey. *Archives of Disease in Childhood*, 90, (11), 1107-1111.
- Hergenrather, J. R. & Rabinowitz, M. (1991). Age-related differences in the organisation of children's knowledge of illness. *Developmental Psychology*, 27, 952-959.

- Herman, C. P. & Mack, D. (1975). Restrained and unrestrained eating. *Journal of Personality, 43*, 647-660.
- Hill, A. J. (1993). Pre-adolescent dieting: Implications for eating disorders. *International Review of Psychiatry, 5*, (1), 87-99.
- Hill, A. J., Draper, E. & Stack, J. (1994). A weight on children's minds: Body shape dissatisfactions at 9-years old. *International Journal of Obesity, 18*, 383-389.
- Hill, A. J., Oliver, S. & Rogers, P. (1992). Eating in the adult world: The rise of dieting in childhood and adolescence. *British Journal of Clinical Psychology, 31*, 95-105.
- Hill, A. J., & Silver, E. K. (1995). Fat, friendless and unhealthy: 9-year old children's perception of body shape stereotypes. *International Journal of Obesity and Related Metabolic Disorders, 19*, 423-430.
- Hinton, P. R., Brownlow, C., McMurray, I. & Cozens, B. (2004). *SPSS Explained*. East Sussex: Routledge.
- Hu, G., Tuomilehto, J., Silventoinen, K., Barengo, N. C., Peltonen, M. & Jousilahti, P. (2005). The effects of physical activity and body mass index on cardiovascular, cancer and all-cause mortality among 47,212 middle-aged Finnish men and women. *International Journal of Obesity, 29*, 894-902.
- Janz, N. K. & Becker, M. H. (1984). *The Health Belief Model: A Decade Later*. In M. Conner & P. Norman (Eds.) (1995). *Predicting Health Behaviour*. Buckingham: Open University Press.
- Jerusalem, M. & Schwarzer, R. (1995). Generalized Self-efficacy Scale. In J. Weinman, S. Wright, & M. Johnston, (Eds.). *Measures in Health Psychology: A User's Portfolio. Causal and Control Beliefs*. Windsor, UK: Nfer-Nelson, 35-37.

- Jodelet, D. (1991). *Madness and Social Representations*. London: Harvester Wheatsheaf.
- Joe, V. C. (1971). Review of the internal-external control construct as a personality variable. *Psychological Reports*, 28, 619-640.
- Johnson, B. & Hackett, A. F. (1997). Eating habits of 11-14 year old schoolchildren living in less affluent areas of Liverpool. *Journal of Human Nutrition and Dietetics*, 10, 135-144.
- Jones, L. W., Sinclair, R. C. & Courneya, K. S. (2003). The effects of source credibility and message framing on exercise intentions, behaviours, and attitudes: An integration of the Elaboration Likelihood Model and Prospect Theory. *Journal of Applied Social Psychology*, 33, (1), 179-196.
- Jotangia, D., Moody, A., Stamakakis, E. & Wardle, H. (2005). *Obesity among Children Under 11*. London: National Centre for Social Research.
- Kahneman, D. & Tversky, A. (1979). Prospect Theory: An analysis of decision under risk. *Econometrica*, 47, 263-291.
- Kahneman, D. & Tversky, A. (1982). The psychology of preferences. *Scientific American*, 246, 162-170.
- Kellar, I. & Abraham, C. (2005). Randomized controlled trial of a brief research-based intervention promoting fruit and vegetable consumption. *British Journal of Health Psychology*, 10, 543-558.
- Kendall, P. C. & Hammen, C. (1998). *Abnormal Psychology: Understanding Human Problems*. (2<sup>nd</sup> Edn.). Boston, New York: Houghton Mifflin Company.

- Kerr, J., Weitkunat, R., & Moretti, M. (Eds.) (2005). *ABC of Behaviour Change: A Guide to Successful Disease Prevention and Health Promotion*. London: Elsevier Ltd.
- Kimm, S. Y. S., Glynn, N. W., Kriska, A. M., Daniels, S. R., Barton, B. A. & Liu, K. (2005). Relation between the changes in physical activity and body-mass index during adolescence: A multicentre longitudinal study. *Lancet*, *366*, 301-307.
- Kister, M. C. & Patterson, C. J. (1980). Children's conceptions of the causes of illness: Understanding of contagion and use of immanent justice. *Child Development*, *51*, 839-846.
- Klesges, L. M., Baranowski, T., Beech, B., Cullen, K., Murray, D. M., Rochon, J. & Pratt, C. (2004). Social desirability bias in self-reported dietary, physical activity and weight concerns measures in 8- to 10-year-old African American girls: Results from the Girls health Enrichment Multisite Studies (GEMS). *Preventive Medicine*, *38*, 78-87.
- Kok, G., Den Boer, D., De Vries, H., Gerards, F., Hospers, H. J. & Mudde, A. N. (1992). *Self-Efficacy and Attribution Theory in Health Education*. In R. Schwarzer (Ed.) *Self-efficacy: Thought Control of Action*. Washington, DC: Hemisphere, 245-262.
- Kumanyika, S. K., Horn, L. V., Bowen, D., Perri, M. G., Rolls, B. J., Czajkowski, S. M. & Schron, E. (2000). Maintenance of dietary behaviour change. *Health Psychology*, *19*, (1), 42-56.
- Kurtz, Z. & Thornes, R. (2000). *Health Needs of School Age Children: The Views of Children, Parents and Teachers Linked to Local and National Information*. London: HMSO.

- Kyriakaki, M. & Orbell, S. (2006). *Message Framing and the Promotion of Physical Health: A Meta-Analysis of Experimental Studies*. Symposium paper presented at Division of Health Psychology Annual Conference, Essex.
- Lamerz, A., Kuepper-Nybelen, J., Wehle, C., Bruning, N., Trost-Brinkhues, G., Brenner, H., Hebebrand, J. & Herpertz-Dahlmann, B. (2005). Social class, parental education, and obesity prevalence in a study of six-year-old children in Germany. *International Journal of Obesity*, 29, 373-380.
- Landgraf, J. M. & Abetz, L. N. (1996). *Measuring Health Outcomes in Paediatric Populations: Issues in Psychometrics and Application*. In B. Spiker (Ed.). *Quality of Life and Pharmacoeconomics in Clinical Trials*. (2<sup>nd</sup> Edn.). Philadelphia: Lippincott-Raven Publishers, 793-800.
- Lau, R. R. (1982). Origins of health locus of control beliefs. *Journal of Personality and Social Psychology*, 42, 322-334.
- Lau, R. R., Hartman, K. A. & Ware, J. E. (1986). Health as a value: Methodological and theoretical considerations. *Health Psychology*, 5, (1), 25-43.
- Lau, R. R. & Klepper, S. (1988). The development of illness orientations in children aged 6 through 12. *Journal of Health and Social Behaviour*, 29, 149-168.
- Lau, R. R., Quadrel, M. J. & Hartman, K. A. (1990). Development and change of young adults' preventive health beliefs and behaviour: Influence from parents and peers. *Journal of Health and Social Behaviour*, 31, 240-259.
- Lefcourt, H. M. (Ed.) (1982). *Locus of Control: Current Trends in Theory and Research*, (2<sup>nd</sup> Edn.) Hillsdale, NJ: Lawrence Erlbaum Associates.
- Leventhal, H. & Cleary, P. D. (1980). The smoking problem: A review of the research and the theory in behavioural risk modification. *Psychological Bulletin*, 88, 370-405.

- Leventhal, H., Prochaska, T. R. & Hirschman, R. S. (1985). *Preventive Health Behaviour Across the Life-Span*. In J. C. Rosen & L. J. Solomon (Eds.) *Prevention in Health Psychology*. Hanover, NH: University Press of New England, 190-235.
- Levi, R. & Drotar, D. (1998). *Critical Issues and Needs in Health-Related Quality of Life Assessment of Children and Adolescents with Chronic Health Conditions*. In D. Drotar (Ed.). *Measuring Health Related Quality of Life in Children and Adolescents: Implications for Research and Practice*. Mahwah, N. J.: Lawrence Erlbaum Associates, 3-24.
- Li, C., Pentz, M. A. & Chou, C. P. (2002). Parental substance use as a modifier of adolescent substance use risk. *Addiction*, *97*, 1537-1550.
- Lohaus, A., Klein-Hessling, J., Ball, J. & Wild, M. (2004). The prediction of health-related behaviour in elementary school children. *Journal of Health Psychology*, *9*, (3), 375-379.
- Lowe, C. F., Dowey, A. J. & Horne, P. J. (1998). *Changing What Children Eat*. In A. Murcott (Ed.) *The Nation's Diet: The Social Science of Food Choice*. London: Longman, 57-80.
- Luszczynska, A., Scholz, U. & Schwarzer, R. (2005). The General Self-Efficacy Scale: Multicultural validation studies. *The Journal of Psychology*, *139*, (5), 439-457.
- Lyons, A. C. & Chamberlain, K. (2006). *Health Psychology: A Critical Introduction*. New York: Cambridge University Press.
- Macfarlane, A. (1993). Health promotion and children and teenagers. *British Medical Journal*, *306*, 680-81.

- Macfarlane, A., McPherson, A., McPherson, K. & Ahmed, L. (1987). Teenagers and their health. *Archives of Disease in Childhood*, 62, 1125-1129.
- Maddux, J. E., Roberts, M. C., Sledden, E. A. & Wright, L. (1986). Developmental issues in child health psychology, *American Psychologist*, 41, 25-34.
- Madge, N. & Harvey, J. G. (1999). Suicide among the young: The size of the problem. *Journal of Adolescence*, 22, 145-156.
- Mahasneh, S. M. (2001). Health perceptions and health behaviours of poor urban Jordanian women. *Journal of Advanced Nursing*, 36, 58-68.
- Manfredo, M. J. & Shelby, B. (1989). The effect of using self-report measures in tests of attitude-behaviour relationships. *Journal of Social Psychology*, 128, 731-743.
- Manson, J. E., Skerrett, P. J., Greenland, P. & VanItallie, T. B. (2004). The escalating pandemics of obesity and sedentary lifestyle: A call to action for clinicians. *Archives of Internal Medicine*, 164, (3), 249-258.
- Marks, D. F. (1994). Psychology's role in The Health of the Nation. *The Psychologist*, March, 119-121.
- Marteau, T. & Johnston, M. (1987). Health psychology: The danger of neglecting psychological models. *Bulletin of The British Psychological Society*, 40, 82-85.
- Martins, Y. (2002). Try it, you'll like it! Early dietary experiences and food acceptance patterns. *The Journal of Pediatric Nutrition and Development*, 98, 12-20.
- Matarazzo, J. D. (1984). *Behavioural Health: A 1990 Challenge for the Health Sciences Professions*. In J. D. Matarazzo, N. E. Miller, S. M. Weiss, J. A.



- Herd & S. M. Weiss (Eds.). *Behavioural Health: A Handbook of Health Enhancement and Disease Prevention*. New York: Wiley, 3-40.
- Maynard, M., Gunnell, D., Emmett, P., Frankel, S. & Davey Smith, G. (2003). Fruit, vegetables, and antioxidants in childhood and risk of adult cancer: The Boyd Orr cohort. *Journal of Epidemiology and Community Health*, 57, 218–225.
- McCall, L. & Ginis, K. (2004). The effects of message framing on exercise adherence and health beliefs among patients in a cardiac rehabilitation program. *Journal of Applied Biobehavioural Research*, 9, (2), 122-135.
- McEachan, R., Conner, M. & Lawton, R. (2005). A meta-analysis of theory of planned behaviour studies: The impact of behaviour type. (Submitted for publication). In M. Conner, & P. Norman, (Eds.) *Predicting Health Behaviour (2<sup>nd</sup> Edn)*. Berkshire: Open University Press.
- McElroy, M. (2002). *Resistance to Exercise: A Social Analysis of Inactivity*. Champaign, IL: Human Kinetics.
- McGuire, W. J. (1996). The Yale Communication and Attitude-Change Program in the 1950s. In E.E. Dennis & E. Wartella (Eds.). *American Communication Research: The Remembered History*. Hillsdale, N. J.: Erlbaum, pg 39-59.
- McKenzie, J. (2005). *Planning and Evaluating Interventions*. In J. Kerr, R. Weitkunat, & M. Moretti (Eds.) *ABC of Behaviour Change: A Guide to Successful Disease Prevention and Health Promotion*. London: Elsevier Ltd, pg 41-54.
- McKenzie, J. F. & Smeltzer, J. L. (2000). *Planning, Implementing, and Evaluating Health Promotion Programs: A Primer (2<sup>nd</sup> Edn.)* Boston: Allyn & Bacon.
- McNeill, A. D., Jarvis, M. J., Stapleton, M. A., Russell, M. A. H., Eiser, J. R., Gammage, P. & Gray, E. M. (1988). Prospective study of factors predicting

- uptake of smoking in adolescents. *Journal of Epidemiology and Community Health*, 43, 72-78.
- Mechanic, D. & Hansell, S. (1987). Adolescent competence, psychological well-being, and self-assessed physical health. *Journal of Health and Social Behaviour*, 28, 364-374
- Meyerowitz, B. E. & Chaiken, S. (1987) The effect of message framing on breast self-examination attitudes, intention, and behaviour. *Journal of Personality and Social Psychology*, 52, 500-510.
- Miller, S. M. (1987). Monitoring and blunting: Validation of a questionnaire to assess styles of information seeking under threat. *Journal of Personality and Social Psychology*, 52, 345-353.
- Millstein, S. G., Adler, N. E. & Irwin, C. E. (1981). Conceptions of illness in young adolescents. *Pediatrics*, 68, 834-839
- Millstein, S. G. & Irwin, C. E. (1987). Concepts of health and illness: Different constructs or variations on a theme? *Health Psychology*, 6, 515-524.
- Milne, S., Sheeran, P. & Orbell, S. (2000). Prediction and intervention in health-related behaviour: A meta-analytic review of protection motivation theory. *Journal of Applied Social Psychology*, 30, 106-143.
- Misra, R. & Aguilon, S. (2001). Predictors of health behaviours in rural adolescents. *Health Education*, 101, (1), 22-30.
- Moncher, F. J. & Prinz, R. J. (1991). Treatment fidelity in outcome studies. *Clinical Psychology Review*, 11, 247-266.

- Mulvihill, C., Rivers, K. & Aggleton, P. (2000). *Physical Activity 'At Our Time': Qualitative Research Among Young People Aged 5 to 15 Years and Parents*. London: Health Education Authority.
- Murray, C. & Lopez, A. D. (1997). *The Global Burden of Disease*. Cambridge: Harvard University Press.
- Murray, D. M. & Perry, C. L. (1987). The measurement of substance use among adolescents. (When is the “bogus pipeline” method needed?). *Addictive Behaviours, 12*, 225-233.
- Murray, M., Swan, A. V., Johnson, M. R. D. & Bewley, B. R. (1983). Some factors associated with increased risk of smoking by children. *Journal of Child Psychology and Psychiatry, 24*, 223-232.
- Must, A. (2005). Physical activity and sedentary behaviour: A review of longitudinal studies of weight and adiposity in youth. *International Journal of Obesity, 29*, (2), 84-96.
- Nahit, E., Fielder, A., Charlton, A., Povey, A. & Mudde, A. (2003). Smoking behaviour in year 8 pupils: Baseline characteristics of the UK ESFA longitudinal study. *International Journal of Health Promotion & Education, 14*, (1), 4-13.
- Naidoo, J. & Wills, J. (2005). *Public Health and Health Promotion: Developing Practice (2nd Edn.)*. Philadelphia, USA: Elsevier.
- Natapoff, J. (1978). Children's views of health: A developmental study. *American Journal of Public Health, 68*, 995-1000.
- Nemcek, M. A. (1990). Health beliefs and preventive behaviour: A review of research literature. *American Association of Occupational Health Journal, 38*, 127-138.

- NHS Health and Social Care Information Centre. (2005). *Health Survey for England 2004: Updating of Trend Tables to Include 2004 Data*. London: HMSO.
- Nigg, C. R., Allegrante, J. P. & Ory, M. (2002). Theory-comparison and multiple behaviour research: Common themes advancing health behaviour research. *Health Education Research, 17*, (5), 670-679.
- Noorani, S. (2005). Food in schools: Update. *Nutrition Bulletin, 30*, 278-281.
- Norman, P., Bennett, P., Smith, C. & Murphy, S. (1997). Health locus of control and leisure-time exercise. *Personality and Individual Differences, 23*, 769-774.
- Norman, P., Boer, H. & Seydel, E. R. (2005). *Protection Motivation Theory*. In M. Conner & P. Norman (Eds.). *Predicting Health Behaviour (2<sup>nd</sup> Edn.)*. Berkshire: Open University Press, 81-126.
- Norman, P. & Bennett, P. (1995). *Health Locus of Control*. In M. Conner & P. Norman (Eds.) *Predicting Health Behaviour*. Buckingham: Open University Press, 62-94.
- Normandeau, S., Kalnins, I., Jutras, S. & Hanigan, D. (1998). A description of 5 to 12 year old children's conception of health within the context of their daily life. *Psychology and Health, 13*, (5), 883-896.
- Nowak, M. & Crawford, D. (1998). Getting the message across: Adolescents' health concerns and views about the importance of food. *Australian Journal of Nutrition and Dietetics, 55*, 3-8.
- Nutbeam, D. & Smith, C. (1991). *Evaluating Young Health Education: How Can We Do It and What Should We Measure*. In D. Nutbeam, B. Hagland, P. Farley & P. Tillgren (Eds.) *Youth Health Promotion: From Theory to Practice in School and Community*. London: Forbes Publications.

- O'Dea, J. (2003). Why do kids eat healthful food? Perceived benefits of and barriers to healthful eating and physical activity among children and adolescents. *Journal of American Dietetic Association, 103*, 497-501.
- Oakely, A., Brannen, J. & Dodge, K. (1992). Young people, gender and smoking in the United Kingdom. *Health Promotion International, 7*, 75-88.
- Ogden, J. (2000). *Health Psychology: A Textbook. (2<sup>nd</sup> Edn.)* Buckingham: Open University Press.
- Ogden, J. (2004). *Health Psychology: A Textbook. (3<sup>rd</sup> Edn.)* Berkshire: Open University Press.
- Olivera, S. A., Ellison, R. C. & Moore, L. L. (1992). Parent-child relationships in nutrient intake: The Framingham Children's Study. *American Journal of Clinical Nutrition, 56*, 593-598.
- O'Sullivan, I., Orbell, S., Rakow, T. & Parker, R. (2004). Prospective research in health science settings: Health psychology, science and the 'Hawthorne' effect, *Journal of Health Psychology, 9*, (3), 355-359.
- Parcel, G. S. & Meyer, M. D. (1978). Development of an instrument to measure children's health locus of control. *Health Education Monographs, 6*, 149-159.
- Parcel, G. S., Nader, P. R. & Rogers, P. J. (1980). Health locus of control and health values: Implications for school health education. *Health Values: Achieving High Level Wellness, 4*, 32-37.
- Petersen, S., Peto, V. & Rayner, M. (2004). *2004 Coronary Heart Disease Statistics*. London: British Heart Foundation.

- Petrie, K. J. & Weinman, J. A. (Eds.) (1997). *Perceptions of Health and Illness: Current Research and Applications*. Amsterdam, Netherlands: Harwood Academic Publishers.
- Plotnikoff, R. C. & Higginbotham, N. (2002). Protection Motivation Theory and exercise behaviour change for the prevention of coronary heart disease in a high risk, Australian representative community sample of adults. *Psychology, Health and Medicine*, 7, (1), 87-98.
- Polivy, J. & Herman, C. P. (1985). Dieting and bingeing: A causal analysis. *American Psychologist*, 40, 193-201.
- Porcellato, L., Dughill, L. & Springett, J. (2002). Using focus groups to explore children's perceptions of smoking: Reflections on practice. *Health Education*, 102, (6), 310-320.
- Prochaska, J. O. & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology*, 51, 390-395.
- Rabinowitz, S., Melamed, S., Weisberg, E., Tal, D. & Ribak, J. (1992). Personal determinants of leisure-time exercise activities. *Perceptual and Motor Skills*, 75, 779-784.
- Rawson, D. (2002) *The Growth of Health Promotion Theory and Its Rational Reconstruction: Lessons from the Philosophy of Science*. In R. Bunton & G. Macdonald (Eds.) *Health Promotion: Disciplines and Diversity*. (2<sup>nd</sup> Edn.) London: Routledge, 202-224.
- Reilly, J. J., Dorosty, A. R. & Emmett, P. M. (1999). Prevalence of overweight and obesity in British children: Cohort study. *British Medical Journal*, 319, 1039.

- Richardson, J. L., Dwyer, K., McGuigan, K., Hansen, W. B., Dent, C. W., Johnson, C. A., Sussman, S. Y., Brannon, B. & Flay, B. (1989). Substance use among adolescents who take care of themselves after school. *Pediatrics*, *84*, 556-566.
- Riley, M. W., Matarazzo, J. D. & Baum, A. (Eds.) (1987). *Perspectives in Behavioural Medicine: The Aging Dimension*. Hillsdale, N.J.: Erlbaum.
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology*, *91*, 93-114.
- Rolland, K., Farnhill, D. & Griffiths, R. A. (1996). Children's perceptions of their current and ideal body sizes and body mass index. *Perceptual and Motor Skills*, *82*, (2), 651-656.
- Rosenstock, I. M. (1966). Why people use health services. *Millbank Memorial Fund Quarterly*, *44*, 94-124.
- Rothman, A. J. & Salovey, P. (1997). Shaping perceptions to motivate healthy behaviour: The role of message framing. *Psychological Bulletin*, *121*, 3-19.
- Rothman, A. J., Salovey, P., Antone, C., Keough, K. & Martin, C. D. (1993). The influence of message framing on intentions to perform health behaviours. *Journal of Experimental Social Psychology*, *29*, 408-433.
- Rotter, J. B. (1954). *Social Learning and Clinical Psychology*. Engelwood Cliffs, New Jersey: Prentice Hall
- Rotter, J. B. (1966). Generalised expectancies for internal versus external control of reinforcement. *Psychological Monographs, General and Applied*, *80*, (609), 1-28.
- Ruderman, A. J. (1986). Dietary restraint: A theoretical and empirical review. *Psychological Bulletin*, *99*, 247-62.

- Sargent, J. D. & Dalton, M. (2001). Does parental disapproval of smoking prevent adolescents from becoming established smokers? *Pediatrics*, *108*, (6), 1256-1262.
- Schmidt, L. J., Garratt, A. M. & Fitzpatrick, R. (2001). Child/parent-assessed population health outcome measures: A structured review. *Child: Care, Health and Development*, *28*, 219-226.
- Schneider, T. R., Salovey, P., Pallonen, U., Mundorf, N., Smith, N. F. & Steward, W. T. (2001). Visual and auditory message framing effects on tobacco smoking. *Journal of Applied Social Psychology*, *31*, (4), 667-682.
- Schwarzer, R. (1992). *Self-efficacy in the Adoption and Maintenance of Health Behaviours: Theoretical Approaches and a New Model*. In R. Schwarzer (Ed.) *Self-efficacy: Thought Control of Action*. Washington, DC: Hemisphere, 217-242.
- Schwarzer, R. (Ed.) (1992). *Self-efficacy: Thought Control of Action*. Washington, DC: Hemisphere.
- Schwarzer, R. & Fuchs, R. (1995). *Self-efficacy and Health Behaviours*. In M. Conner & P. Norman (Eds.) (1995). *Predicting Health Behaviour*. Buckingham: Open University Press, 163-196.
- Schwarzer, R., & Renner, B. (2000). Social-cognitive predictors of health behavior: Action self-efficacy and coping self-efficacy, *Health-Psychology*, *19*, 487-495.
- Shannon, B., Bagby, R., Wang, M. Q. & Trenkner, L. (1990). Self-efficacy: A contributor to the explanation of eating behaviour. *Health Education Research*, *5*, 395-407.



- Sheeran, P. (2002). *Intention-Behaviour Relations: A Conceptual and Empirical Review*. In W. Strobe & M. Hewstone (Eds.) *European Review of Social Psychology, Vol.12*. Chichester: Wiley, 1-36.
- Sheeran, P., Milne, S., Webb, T. L. & Gollwitzer, P. M. (2005). *Implementation Intentions and Health Behaviour*. In M. Conner & P. Norman (Eds.) *Predicting Health Behaviour. 2<sup>nd</sup> Edition*. Berkshire: Open University Press, 276-323.
- Shelton Smith, M. & Wallston, K. A. (1992). How to measure the value of health. *Health Education Research, 7*, 129-135.
- Shemilt, I., O'Brien, M., Thoburn, J., Harvey, I., Belderson, P., Robinson, J. & Camina, M. (2003). School breakfast clubs, children and family support. *Children and Society, 17*, 100-112.
- Sherratt, E. (1996). High fat intakes are unhealthy but do children know? *Educational Review, 48*, 163-174.
- Sholkamy, H. (1996). *Women's Health Perceptions: A Necessary Approach to an Understanding of Health and Well Being. Monographs in Reproductive Health, 2*. Cairo: Population Council, Regional Office for West Asia and North Africa.
- Slater, M. (2005). *Mediated Communication*. In J. Kerr, R. Weitkunat, & M. Moretti (Eds.) *ABC of Behaviour Change: A Guide to Successful Disease Prevention and Health Promotion*. London: Elsevier Ltd, 303-314.
- Sleap, M. & Warburton, P. (1993). Are primary school children gaining heart health benefits from their journeys to school? *Child: Care Health and Development, 19*, 99-108.

- Sniehotta, F. F., Scholz, U. & Schwarzer, R. (2005). Bridging the intention-behaviour gap: Planning, self-efficacy and action control in the adoption and maintenance of physical exercise. *Psychology and Health, 20*, (2), 143-160.
- Snow, S. J. (2002). Commentary: Sutherland, Snow and water: The transmission of cholera in the nineteenth century. *International Journal of Epidemiology, 31*, 908-911.
- Soames-Job, R. F. (1988). Effective and ineffective use of fear in health promotion campaigns. *American Journal of Public Health, 78*, 163-167.
- Sproston, K. & Primatesta, P. (Eds.) (2003). *Health Survey for England 2003*. London: HMSO.
- Stainton Rogers, W. (1991). *Explaining Health and Illness. An Exploration of Diversity*. Hemel Hempstead: Harvester-Wheatsheaf.
- Stanton, W. R., Willis, M. & Balanda, K. P. (2000). Development of an instrument for monitoring adolescent health issues. *Health Education Research, 15*, 181-190.
- Steffen, V. J., Sternberg, L., Teegarden, L. A. & Shepard, K. (1994). Practice and persuasive frame: Effects on beliefs, intention, and performance of a cancer self-examination. *Journal of Applied Social Psychology, 24*, 897-925.
- Stephens, A. & Wardle, J. (2001). Locus of control and health behaviour revisited: A multivariate analysis of young adults from 18 countries. *British Journal of Psychology, 92*, 659-672.
- Story, M., Kaphingst, K. M. & French, S. (2006). The role of schools in obesity prevention. *The Future of Children, 16*, (1), 109-142.
- Story, M. & Mesnick, M. D. (1986). Adolescent's views on food and nutrition. *Journal of Nutrition Education, 4*, 188-192.

- Stroebe, W. & Stroebe, M. S. (1995). *Social Psychology and Health*. Buckingham: Open University Press.
- Sutton, S. & Sheeran, P. (2003). Meta-analysis of the theory of planned behaviour and past behaviour (Manuscript in preparation). In Sheeran, P., Milne, S., Webb, T. L. & Gollwitzer, P. M. (2005). *Implementation Intentions and Health Behaviour*. In M. Conner & P. Norman (Eds). *Predicting Health Behaviour*. (2<sup>nd</sup> Edn.) Berkshire: Open University Press, 276-323.
- Swan, G., Carmelli, D., Rosenman, R., Fabsitz, R. & Christian, J. (1990). Smoking and alcohol consumption in adult male twins: Genetic heritability and shared environmental influences. *Journal of Substance Abuse*, 2, 39-50.
- Sweeting, H. & West, P. (1996). *The Relationship Between Family Life and Young People's Lifestyles*. York: Joseph Rowntree Foundation.
- Taylor, S. E. (1995). *Health Psychology: Third Edition*. Singapore: McGraw-Hill, Inc.
- Telama, R., Yang, X., Viikari, J., Wanne, O. & Raitatakari, O. (2005). Physical activity from childhood to adulthood: A 21-year tracking study. *American Journal of Preventative Medicine*, 28, (3), 267-273.
- Tinsley, B. J. (1992). Multiple influences on the acquisition and socialization of children's health attitudes and behaviour: An integrative review. *Child Development*, 62, 1043-1069.
- Tinsley, B. J. & Holtgrave, D. R. (1997). A multimethod analysis of risk perceptions and health behaviours. *Educational & Psychological Measurement*, 57, (2), 197-209.

- Todd, J. Currie, C. & Smith, R. (2000). *Health Behaviours of Scottish Schoolchildren: Technical Report 3: Eating Patterns and Physical Activity in the 1990s*. Edinburgh: RUHBC and HEBS.
- Tolar, A. (1978). Some antecedents and personality correlates of health locus of control. *Psychological Reports*, *43*, 1159-1165.
- Tomeo, C. A., Field, A. E., Berkey, C. S., Colditz, G. A. & Frazier, L. (1999). Weight concerns, weight control behaviours, and smoking initiation. *Pediatrics*, *104*, (4), 918-924.
- Turner, S., Zimvraiki, H. & Athanasiou, K. (1997). Investigating children's ideas about fat consumption and health: A comparative study. *Health Education Journal*, *56*, 329-340.
- Tversky, A. & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, *211*, 453-458.
- Unilever (2004). *Social Report: Listening, Learning, Making Progress*. London: Unilever.
- Vögele, C. (2005). *Etiology of Obesity*. In S. Munsch, & C. Beglinger (Eds.) *Obesity and binge eating disorder. Bibl Psychiatr. Basel, Karger*, *171*, 62-73.
- Vögele, C. (2005b). *Education*. In J. Kerr, R. Weitkunat, & M. Moretti (Eds.) *ABC of Behaviour Change: A Guide to Successful Disease Prevention and Health Promotion*. London: Elsevier Ltd, 271-287.
- Vögele, C. & Woodward, H. (2005). Körperbild, Diätverhalten und körperliche Aktivität bei 9-10 jährigen Kindern [Body image, dietary behaviour and physical activity in 9-10 year old children]. *Kindheit und Entwicklung (Themenheft Essstörungen bei Kindern und Jugendlichen)*, *14*, 229-236.

- Walker, J. (2001). *Control and the Psychology of Health*. Buckingham: Open University Press.
- Wallerstein, N. (1992). Powerlessness, empowerment, and health: Implications for health promotion programs. *American Journal of Health Promotion*, 6, 197-205.
- Wallston, K. A. (1989). *Assessment of control in health care settings*. In A. Steptoe & A. Appels (Eds.) *Stress, Personal Control and Health*. London: Wiley, 85-105.
- Wallston, K. A. (1992). Hocus-pocus, the focus isn't strictly on locus: Rotter's social learning theory modified for health. *Cognitive Therapy and Research*, 16, 183-199.
- Wallston, K. A., Maides, S. A. & Wallston, B. S. (1976). Health-related information seeking as a function of health-related locus of control and health value. *Journal of Research in Personality*, 10, 215-222.
- Wallston, K. A., Wallston, B. S. & DeVellis, R. (1978). Development of multidimensional health locus of control (MHLC) scales. *Health Education Monographs*, 6, 160-170.
- Wanless, D. (2004). *Securing Good Health for the Whole Population: Final report*. London: HMSO.
- Warburton, D. E. R., Nicol, C. W. & Bredin, S. S. D. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, 174, (6), 801-809.
- Warwick, I., Aggleton, P., Chase, E., Schagen, S., Blenkinsop, S., Schagen, I., Scott, E. & Eggers, M. (2005). Evaluating healthy schools: Perceptions of impact

among school-based respondents. *Health Education Research*, 20, (6), 697-708.

Weinman, J., Wright, S. & Johnston, M. (Eds.). (1995). *Measures in Health Psychology: A User's Portfolio*. Windsor, UK: Nfer-Nelson.

Weinstein, N. D. (1982). Unrealistic optimism about susceptibility to health problems. *Journal of Behavioral Medicine*, 5, 441-460.

Weiss, G. L. & Larson, D. L. (1990). Health value, health locus of control, and the prediction of health protective behaviours. *Social Behaviour and Personality*, 18, 121-136.

Weiss, M. R., Wiese, D. M. & Klint, K. A. (1989). Head over heels with success: The relationship between self-efficacy and performance in competitive youth gymnastics. *Journal of Sport and Exercise Psychology*, 11, 444-451.

Wen, C. P., Tsai, S. P., Cheng, T. Y., Hsu, C. C., Chen, T. & Lin, H. S. (2005). Role of parents and peers in influencing the smoking status of high school students in Taiwan. *Tobacco Control*, 14, (Supplement 1), 10-15.

Whitaker, R. C., Wright, J. A., Pepe, M. S., Seidel, K. D. & Dietz, W. H. (1997). Predicting obesity in young adulthood from childhood and parental obesity. *New England Journal of Medicine*, 337, 869-873.

Williams-Piehota, P., Schneider, T. R., Pizarro, J., Mowad, L. & Salovey, P. (2004). Matching health messages to health locus of control beliefs in promoting mammography utilization. *Psychology and Health*, 19, (4), 407-423.

Williamson, D. A., Lawson, O. J., Brooks, E. R., Wozniak, P. J., Ryan, D. H., Bray, G. A., & Duchmann, E. G. (1995). Association of body mass with dietary restraint and disinhibition. *Appetite*, 25, 31-41.

- Wood, R. & Bandura, A. (1989). Social cognitive theory of organizational management. *Academy of Management Review*, 14, 361-384.
- Woods, S., Springett, J., Porcellato, L. & Dugdill, L. (2005). Stop it, it's bad for you and me: Experiences of and views on passive smoking among primary-school children in Liverpool. *Health Education Research*, 20, 6, 645-655.
- World Health Organisation. (1947). *The Constitution of the World Health Organisation*. Geneva: WHO.
- World Health Organisation. (1984). Health promotion: A WHO discussion document on the concepts and principles. *Reprinted in Journal of the Institute of Health Education*, 23, (1).
- World Health Organisation (1990). *Diet, Nutrition, and the Prevention of Chronic Diseases*. Geneva: WHO.
- World Health Organisation (2001). *Global Burden of Disease Study*. Geneva: WHO.
- Wurtele, S. K., Britcher, J. C. & Saslawsky, D. A. (1985). Relationships between locus of control, health value and preventive health behaviours among women. *Journal of Research in Personality*, 19, 271-278.
- [www.lulusproactivchallenge.co.uk](http://www.lulusproactivchallenge.co.uk).
- [www.RalfSchwarzer.de](http://www.RalfSchwarzer.de)
- [www.wiredforhealth.gov.uk](http://www.wiredforhealth.gov.uk)
- Yanovski, S. Z. (1995). The chicken or the egg: Binge eating disorder and dietary restraint. *Appetite*, 24, 258.
- Young, T. L. & Zimmerman, R. (1998). Parental knowledge of risk behaviours of middle school students. *Archives of Pediatrics & Adolescent Medicine*, 152, 1137-1139.

## **Appendices**

Appendix A: Health Perceptions Questionnaire (HPQ)

Appendix B: Standardised Instructions for HPQ

Appendix C: BHF Magazines

Appendix D: Health Behaviour Schedules

Appendix E: Standardised Intervention Dialogue

Appendix F: Health Behaviour Quiz

Appendix G: Intervention Discussion Sheets

Appendix H: Standardised Visualisation Dialogue

Appendix I: Action Plan Sheets



## **Appendix A: Health Perceptions Questionnaire (HPQ)**

**Original Consent Forms (parent/child)**

**Revised Consent Forms (parent/child) sent on school-headed paper**

### **Part A - Personal Details**

- Section 1- Demographic details
- Section 2- Children's Health Locus of Control Scale
- Section 3- Generalised Self-Efficacy Scale
- Section 4- Health Value Scale
- Section 5- Own image

### **Part B - Mums Health Behaviour**

### **Part C – Dads Health Behaviour**

- Section 1 – Eating behaviours
- Section 2 – Physical activity
- Section 3 – Smoking behaviours
- Section 4 – Alcohol consumption
- Section 5 – Parental image

### **Part D – Healthy Eating**

### **Part E – Physical Activity**

### **Part F – Smoking Cigarettes**

### **Part G – Alcohol Consumption**

- Section 1 – Past behaviour/experience
- Section 2 – Behavioural image
- Section 3 – Behavioural importance
- Section 4 – Behaviour-specific self-efficacy
- Section 5 – Intention/ attitude/ outcome expectancy/ outcome evaluation

September 2004

Dear Parent/Guardian,

I am a research student at the University of Luton studying for a PhD in Health Psychology. During September-October 2004 I will be visiting your child's school to carry out a project which seeks to investigate children's perceptions of health and the health behaviours they perform. The children who participate will be asked to fill in a short series of questionnaires during an allocated school lesson. Then later on in the year (November-December), they will be asked to attend a short workshop, again during school time, where they will be assisted to develop an action plan to enhance their health behaviours if needed. I will be conducting all the research myself and I must stress that all the data provided will be anonymous and will be kept completely confidential.

I am conducting this study as I am interested to see whether a child's personality and beliefs about health have any effect on what health behaviours they perform. The health behaviours to be focused on are healthy eating, exercise, and avoiding smoking and alcohol consumption. I am also interested in whether children's perceptions of health are effected by the health behaviours they see in their everyday life.

For your child to be able to participate in this study, I must first ask for your written consent, giving your permission for your child to be involved. If you do not have any objection with your child participating in this study, please could you complete the consent form attached overleaf. You have the right to withdraw your child from the study at any time, however, due to anonymity and confidentiality you will not be able to view the data collected from your child. The overall results produced from the study will be available on request.

If you are happy for your child to be involved in this study and give your consent, please could you give the participation consent form attached to your son/daughter for them to read. If they are also happy to be involved, they need to sign this form, and return both consent forms to their form tutor as soon as possible (no later than 15<sup>th</sup> September 2004).

The questionnaires to be used in this study can be viewed in the school office if you are interested, and I am happy to answer any questions that you may have. If you wish to contact me, please call 01582 489217, or e-mail me at: [angel.chater@luton.ac.uk](mailto:angel.chater@luton.ac.uk)

I would be very grateful of your help, and your child's assistance in this important area of research.

Many thanks for taking the time to read this letter

Angel Chater (MSc, BA (Hons))  
Psychology Department  
University of Luton  
Park Square  
Luton  
LU1 3JU

Please return the slip below to your child's form tutor if you give your consent for your child to participate in the health perception research.

.....detach.....

### **Parent/Guardian Consent Form**

I agree to my son/daughter (please give name) .....  
participating in the health perception research study.

Signed.....parent/guardian

Date.....

Child's tutor group.....

# Consent Form

The questionnaire I will ask you to fill in has been designed to help us learn about different ways children and adolescents look at their health. The answers you give will be kept completely confidential, and your questionnaire will be kept separate from this consent form to ensure all answers are anonymous. All I ask is that you put a reference code (that you will be given on the day), on each questionnaire you fill in, so that I can match the data correctly to the right school.

Some of the questions are of a sensitive nature and you may feel uneasy about answering truthfully, however, it is your own personal experiences and opinions I am interested in, and honesty is important to the scientific value of this research. I promise that no one else will see your answers, including your teachers, parents and friends. And you have the right to withdraw from this study at any time.

**If you are willing to participate, please could you print your school name, class, and your full name below and sign on the dotted line.** Could then hand this form, along with your parents consent form, back to your class tutor by the 6<sup>th</sup> December. Your signed consent is required for me to be able to study your answers, and your assistance is appreciated very much!

**School** .....

**Class** .....

**Print Name** .....

**Signature** .....

I would also like you to participate in a short workshop, where we will discuss topics like the ones raised in the questionnaire. **If you feel you would be willing to participate in this workshop in the near future, could you circle yes and sign below.** If you do not wish to be involved in this activity please circle no.

**Yes**                      **No**                      **Signed** .....

If you have any questions, or if you wish to receive further information regarding this study, please call me-Angel Chater-on 01582 489217, or alternatively, you can e-mail me at; [angel.chater@luton.ac.uk](mailto:angel.chater@luton.ac.uk).

**Thank You In Advance For Your Help**

February 2005

Dear Parent/Guardian,

During February-May 2005 there will be a researcher from the University of Luton visiting the school to carry out a study looking at children's perceptions of health. The children will be asked to fill in a short series of questionnaires during an allocated school lesson. Then a small group will be asked to attend a short workshop, where they will discuss behaviours important to health. All the data provided will be anonymous and will be kept completely confidential. Participation is voluntary, and you have the right to withdraw your child from the study at any time.

Your written consent is needed for your child to be able to participate in this study.

If you are happy with your child participating in this study, please could you complete the consent form below and return to school as soon as possible.

We would be very grateful of your help, and your child's assistance in this research.

**Please return the slip below to your child's form tutor ASAP**

.....detach.....

**Parent/Guardian Consent Form**

I agree to my son/daughter (please give name) .....  
participating in the health perception research study.

Signed.....parent/guardian

Date.....

Child's tutor group.....

## **Pupil Consent Form**

Please could you fill in this short series of questionnaires that relate to your views on healthy eating, exercise, smoking and alcohol. From these we hope to learn about different ways young people look at their health. The answers you give will be kept completely confidential.

You may feel uneasy about answering some of the questions, perhaps because you don't want anyone else to know. But the information you give will not have your name on it, so no one will know what you have said. You don't have to take part in this research and you can change your mind at any time.

If you want to be involved in this project, please could you fill in the details below. Your signed consent is required to be able to study your answers.

**School** .....

**Class** .....

**Print Name** .....

**Signature** .....

You are also invited to join a short workshop (during school time), where in small groups, we will discuss topics like the ones raised in these questionnaires.

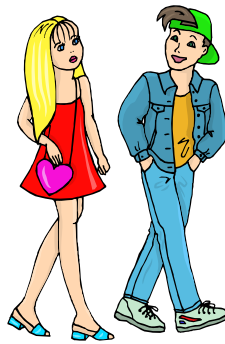
If you would like to participate in this workshop please circle yes and sign below. If you do not wish to be involved in this activity please circle no.

**Yes**            **No**

**Signed** .....

**Thank you in advance for your help**

# The Health Perceptions Questionnaire



## *PART A ~ Stuff About You*

### **Instructions**

Please could you answer the following questions by circling the relevant ones, or filling in the details if required.

It is important you answer **all** the questions.

It would help if we could have an accurate measure of your weight and height, so you will be asked in turn to be measured in another room-please continue until then.

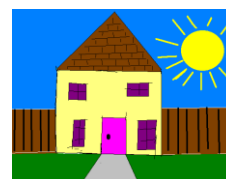
*Thank you for your help.*

## Section 1

1. What year are you in at school?                      Year 7                                      Year 10
2. How old are you?    11yrs    12yrs    14yrs    15yrs
3. Are you...    Male    or    Female
4. In what country were you born?                      .....
5. In what country was your mother born?                      .....
6. In what country was your father born?                      .....
7. What is your religion?                                      .....
8. How tall are you?                                      .....CMS or .....ft.....inches
9. How much do you weigh?                      .....st.....lbs or .....kilograms
10. Who do you live with? (please circle one)



- Mum and Dad
- Mum only
- Dad only
- Mum and partner/step-dad
- Dad and partner/step-mum
- Other (please state) .....



11. How many hours roughly a day do you spend with your mum and/or dad (who look after you)? Please enter hours for each day in the table below. Put 0 if you do not see them at all.

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Mum	hrs	hrs	hrs	hrs	hrs	hrs	hrs
Dad	hrs	hrs	hrs	hrs	hrs	hrs	hrs

12. What is your mum's job?                                      .....
13. What is your dad's job?                                      .....
14. Is there a school nurse at your school?                                      Yes                                      No



## Section 2

### Instructions

We would like to learn about different ways young people look at their health. Here are some statements about health or illness (sickness). Some of them you will think are true and so you will circle the YES. Some of them you will think are **not** true and so you will circle the NO. Even if it is hard to decide, be sure to circle YES or NO for **every** statement. **Never** circle both YES and NO for one statement. There are no right or wrong answers. Be sure to answer the way **you** really feel and **not** the way other people might feel.

**PRACTICE:** Try the statement below.

**a. Children can get sick**

If you think this is true, circle .....YES

If you think this is not true, circle .....NO

**b. Children never get sick**

If you think this is true, circle .....YES

If you think this is not true, circle .....NO

Try one more statement for practice...

**c. When I am not sick, I am healthy.....YES NO**

**Now do the rest of the statements the same way you practised**

- |  |     |    |
|--|-----|----|
| 1. Good health comes from being lucky                                  | YES | NO |
| 2. I can do things to stop me from becoming ill                        | YES | NO |
| 3. Bad luck makes people become ill                                    | YES | NO |
| 4. I can only do what the doctor tells me to do                        | YES | NO |
| 5. If I become ill, it is because becoming ill just happens            | YES | NO |
| 6. People who never become ill are just plain lucky                    | YES | NO |
| 7. It is the job of my parent(s) to keep me from becoming ill          | YES | NO |
| 8. Only a doctor or a nurse keeps me from becoming ill                 | YES | NO |
| 9. When I am ill, I can do things to get better                        | YES | NO |
| 10. If I get hurt it is because accidents just happen                  | YES | NO |
| 11. I can do many things to fight illness                              | YES | NO |
| 12. Only the dentist can take care of my teeth                         | YES | NO |
| 13. Other people must tell me how to stay healthy                      | YES | NO |
| 14. I always turn to the teacher right away if I get hurt at school    | YES | NO |
| 15. It is the teacher's job to keep me from having accidents at school | YES | NO |
| 16. I can make many choices about my health                            | YES | NO |
| 17. Other people must tell me what to do when I feel ill               | YES | NO |
| 18. Whenever I feel ill I report to the teacher right away             | YES | NO |
| 19. There are things I can do to have healthy teeth                    | YES | NO |
| 20. I can do many things to prevent accidents                          | YES | NO |

### Section 3

#### *Instructions*

Here we would like to find out how you feel you respond to certain situations. Please could you circle the response you agree with the most. Please could you ensure you answer all statements and that you only circle one answer for each statement.

	Not at all true	Barely true	Moderately true	Exactly true
1. I can always manage to solve difficult problems if I try hard enough	1	2	3	4
2. If someone opposes me, I can find means and ways to get what I want	1	2	3	4
3. It is easy for me to stick to my aims and accomplish my goals	1	2	3	4
4. I am confident that I could deal efficiently with unexpected events	1	2	3	4
5. Thanks to my resourcefulness, I know how to handle unforeseen situations	1	2	3	4
6. I can solve most problems if I invest the necessary effort	1	2	3	4
7. I can remain calm when facing difficulties because I can rely on my coping abilities	1	2	3	4
8. When I am confronted with a problem, I can usually find several solutions	1	2	3	4
9. If I am in trouble, I can usually think of something to do	1	2	3	4
10. I can usually handle whatever comes my way	1	2	3	4

## Section 4

### Instructions

Now we are interested in how you value your health. Indicate the extent to which you agree with the following four statements, using the scale below. Write the appropriate number in the blank space to the right of each statement.

Strongly agree		Moderately agree		Moderately disagree		Strongly disagree
1	2	3	4	5	6	7

1. There is nothing more important than good health
2. Good health is only of minor importance in a happy life
3. If you don't have your health, you don't have anything
4. There are many things I care about more than my health



## Section 5

### Instructions

The next few questions are about how you see yourself, your perception of your image. We are interested in how you would describe yourself, not how you think others would describe you.

Could you please give us your opinion of the typical image you hold of yourself by stating how closely each of the 16 adjectives below describes how you see you.

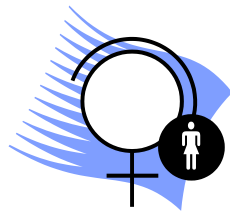
Please could you circle the number you feel best represents your image, from 1 meaning 'not at all' to 7 meaning 'extremely'. Please ensure you give your opinion on every descriptive statement.

### 1. Describe how you see yourself

	1	2	3	4	5	6	7
	Not at all 1 ←-----→ 7 Extremely						
Healthy	1	2	3	4	5	6	7
Exciting	1	2	3	4	5	6	7
Popular	1	2	3	4	5	6	7
Immature	1	2	3	4	5	6	7
"Cool" (sophisticated)	1	2	3	4	5	6	7
Unattractive	1	2	3	4	5	6	7
Independent	1	2	3	4	5	6	7
Careless	1	2	3	4	5	6	7
Glamorous	1	2	3	4	5	6	7
Dull (boring)	1	2	3	4	5	6	7
Good Looking	1	2	3	4	5	6	7
Dirty	1	2	3	4	5	6	7
Successful	1	2	3	4	5	6	7
Unhealthy	1	2	3	4	5	6	7
Uncool	1	2	3	4	5	6	7
Leader	1	2	3	4	5	6	7



# The Health Perceptions Questionnaire



## *PART B ~ Mums Health Behaviours*

### **Instructions**

**We are interested in your mum's (or female caregiver e.g. step-mum, Nan) health behaviours.**

If you do not have close contact with your mum or any other female who looks after you, please move on to part C.

**Please answer as honestly as possible, by circling what you think is the most relevant answer for your mum, unless it states otherwise.**

**Remember, all answers will be kept completely confidential!**

Don't worry if you don't know exactly what your mum does, as we are interested in what you think she does, and not what she actually does.

*Thank you for your help.*

## Section 1

The next few questions are about your mum's eating behaviours:

When we refer to healthy foods, we mean foods that are low in fat, sugar and salt, and rich in vitamins and fibre. A healthy diet would include lots of fruit and vegetables, pasta, potatoes, rice, and fish, and a low intake of fatty or sugary foods, such as chips, burgers, chocolate, cakes and so on.



1. How would you describe your mum?

- Very underweight
- Slightly underweight
- About the right weight
- Slightly overweight
- Very overweight

2. How satisfied would you say she is with her current body shape and size?

- Very satisfied
- Satisfied
- Neither satisfied nor dissatisfied
- Partly dissatisfied
- Very dissatisfied

3. How often do you think she tries to eat a healthy diet?

- Rarely
- Sometimes
- Most times
- Always

4. In the last week how often do you think your mum....

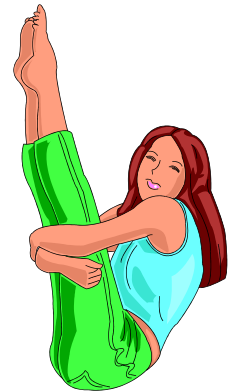
(please tick <b>one</b> for each item)	Every-day	Almost everyday	2-3 times	Once	Rarely/ Never
Try to eat healthy foods?					
Eat breakfast?					
Eat dinner?					
Eat between meals (snack)?					
Have a takeaway meal?					

## Section 2

The next few questions are about your mum's physical activity

5. How many times in **the last week** do you think your mum did any type of physical activity described below for at least 30 minutes that would have made her breathe hard and sweat?

(please tick <b>one</b> for each item)	Number of times			
	0	1-2	3-5	6 +
Sports or sports training, (e.g. basketball, tennis, netball, football,)				
Vigorous physical activities or exercise, (e.g. fast-walking, weight training, jogging, fast dancing, bike riding or similar aerobic activity)				
Other physical activities that made her sweat and breathe hard, (e.g. physical work, walking)				



## Section 3

The next few questions are about smoking cigarettes



6. Do you think your mum has **ever** smoked even part of a cigarette?

No (please go to question 13)

Yes, just a few puffs

Yes, she has smoked **less** than 10 cigarettes in her life

Yes, she has smoked **more** than 10 cigarettes in her life

Yes, she has smoked **more** than 100 cigarettes in her life

7. Do you think your mum has smoked cigarettes in the **last week**?

Yes

No

8. Do you think she usually smokes cigarettes each day?

Yes

No

9. If yes to question 8, how many do you think she usually smokes in a day?

.....cigarettes

10. Do you think she has smoked more than 10 cigarettes in the last 12 months?

Yes (please continue)

No (Go to question 13)

11. In the last 12 months, do you think your mum has **tried** to quit smoking?

Yes

No

12. In the last 12 months, how many times would you say your mum has tried to quit smoking for a **week or more**?

None

Once

Twice

Three times or more





## Section 4

### The next few questions are about drinking alcohol

When we refer to alcohol consumption, we mean to drink a unit of anything alcoholic-this includes a glass of wine, a pint of beer, an alcopop, a shot of vodka/brandy.



13. Do you think your mum has **ever** had even part of an alcoholic drink?

No (please go to section 5)

Yes, just a few sips

Yes, she's had less than 10 alcoholic drinks in her life

Yes, she's had more than 10 alcoholic drinks in her life

14. Do you think your mum has had an alcoholic drink in the **last week**?

Yes No

15. Do you think your mum has ever been drunk at any time in the last 6 months?

Yes No

16. Do you think your mum has ever drunk so much that she threw up (vomited)?

Yes No

17. Think back over the last **2 weeks**. How many times would you say your mum had **3** or more drinks on any one occasion?

None

Once

Twice

3-6 times

7 or more times

18. Think back over the last **2 weeks**. How many times would you say your mum had **5** or more drinks on any one occasion?

None

Once

Twice

3-6 times

7 or more times

## Section 5

The next few questions are about the image you have of your mum

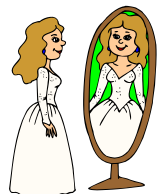
This question is similar to the one we asked about the image you have of yourself however here we are interested in how you perceive the image of your mum.

Could you please give us your opinion of the typical image you hold of your mum by stating how closely each of the 16 adjectives describes her typical image. Please could you circle the number you feel best represents the image, from 1 meaning 'not at all' to 7 meaning 'extremely'. Please ensure you give your opinion on every descriptive statement.

**19.** Describe the 'typical' image you have of your mum

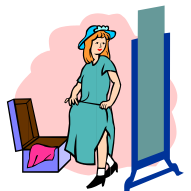
	1	2	3	4	5	6	7
	Not at all 1 ←-----→ 7 Extremely						
Healthy	1	2	3	4	5	6	7
Exciting	1	2	3	4	5	6	7
Popular	1	2	3	4	5	6	7
Immature	1	2	3	4	5	6	7
"Cool" (sophisticated)	1	2	3	4	5	6	7
Unattractive	1	2	3	4	5	6	7
Independent	1	2	3	4	5	6	7
Careless	1	2	3	4	5	6	7
Glamorous	1	2	3	4	5	6	7
Dull (boring)	1	2	3	4	5	6	7
Good Looking	1	2	3	4	5	6	7
Dirty	1	2	3	4	5	6	7
Successful	1	2	3	4	5	6	7
Unhealthy	1	2	3	4	5	6	7
Uncool	1	2	3	4	5	6	7
Leader	1	2	3	4	5	6	7

We are also interested in how similar you feel you are to your mum. Please answer the question below:

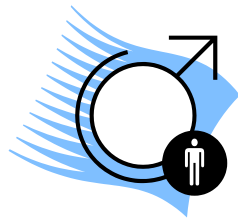


**20.** In general, how similar do you feel you are to your mum?

Not at all    1    2    3    4    5    6    7    Extremely



# The Health Perceptions Questionnaire



## *PART C ~ Dads Health Behaviours*

### Instructions

**We are interested in your dad's (or male caregiver e.g. step-father, granddad) health behaviours.**

If you do not have close contact with your dad or any other male who looks after you, please move on to part D.

**Please answer as honestly as possible, by circling what you think is the most relevant answer for your dad, unless it states otherwise.**

**Remember, all answers will be kept completely confidential!**

Don't worry if you don't know exactly what your dad does, as we are interested in what you think he does, and not what he actually does.

*Thank you for your help.*

## Section 1

The next few questions are about your dad's eating behaviours:

When we refer to healthy foods, we mean foods that are low in fat, sugar and salt, and rich in vitamins and fibre. A healthy diet would include lots of fruit and vegetables, pasta, potatoes, rice, and fish, and a low intake of fatty or sugary foods, such as chips, burgers, chocolate, cakes and so on.



21. How would you describe your dad?

- Very underweight
- Slightly underweight
- About the right weight
- Slightly overweight
- Very overweight

22. How satisfied would you say he is with his current body shape and size?

- Very satisfied
- Satisfied
- Neither satisfied nor dissatisfied
- Partly dissatisfied
- Very dissatisfied

23. How often do you think he tries to eat a healthy diet?

- Rarely
- Sometimes
- Most times
- Always

24. In the last week how often do you think your dad....

(please tick <b>one</b> for each item)	Every-day	Almost everyday	2-3 times	Once	Rarely/ Never
Try to eat healthy foods?					
Eat breakfast?					
Eat dinner?					
Eat between meals (snack)?					
Have a takeaway meal?					

## Section 2

The next few questions are about your dad's physical activity

25. How many times in **the last week** do you think your dad did any type of physical activity described below for at least 30 minutes that would have made him breathe hard and sweat?

(please tick <b>one</b> for each item)	Number of times			
	0	1-2	3-5	6 +
Sports or sports training, (e.g. basketball, tennis, netball, football,)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vigorous physical activities or exercise, (e.g. fast-walking, weight training, jogging, fast dancing, bike riding or similar aerobic activity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other physical activities that made her sweat and breathe hard, (e.g. physical work, walking)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## Section 3

The next few questions are about smoking cigarettes



26. Do you think your dad has **ever** smoked even part of a cigarette?

No (please go to question 13)

Yes, just a few puffs

Yes, he has smoked **less** than 10 cigarettes in his life

Yes, he has smoked **more** than 10 cigarettes in his life

Yes, he has smoked **more** than 100 cigarettes in his life

27. Do you think your dad has smoked cigarettes in the **last week**?

Yes

No

28. Do you think he usually smokes cigarettes each day?

Yes

No

29. If yes to question 8, how many do you think he usually smokes in a day?

.....cigarettes

30. Do you think he has smoked more than 10 cigarettes in the last 12 months?

Yes (please continue)

No (Go to question 13)

31. In the last 12 months, do you think your dad has **tried** to quit smoking?

Yes

No

32. In the last 12 months, how many times would you say your dad has tried to quit smoking for a **week or more**?

None

Once

Twice

Three times or more



## Section 4

The next few questions are about drinking alcohol

When we refer to alcohol consumption, we mean to drink a unit of anything alcoholic-this includes a glass of wine, a pint of beer, an alcopop, a shot of vodka/brandy, a cocktail etc.



33. Do you think your dad has **ever** had even part of an alcoholic drink?

No (please go to section 5)

Yes, just a few sips

Yes, he's had less than 10 alcoholic drinks in his life

Yes, he's had more than 10 alcoholic drinks in his life

34. Do you think your dad has had an alcoholic drink in the **last week**?

Yes No

35. Do you think your dad has ever been drunk at any time in the last 6 months?

Yes No

36. Do you think your dad has ever drunk so much that he threw up (vomited)?

Yes No

37. Think back over the last **2 weeks**. How many times would you say your dad had **3** or more drinks on any one occasion?

None

Once

Twice

3-6 times

7 or more times

38. Think back over the last **2 weeks**. How many times would you say your dad had **5** or more drinks on any one occasion?

None

Once

Twice

3-6 times

7 or more times

## Section 5

The next few questions are about the image you have of your dad

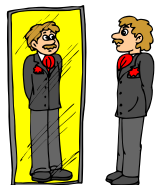
This question is similar to the one we asked about the image you have of yourself however here we are interested in how you perceive the image of your dad.

Could you please give us your opinion of the typical image you hold of your dad by stating how closely each of the 16 adjectives describes his typical image. Please could you circle the number you feel best represents the image, from 1 meaning 'not at all' to 7 meaning 'extremely'. Please ensure you give your opinion on every descriptive statement.

**39.** Describe the 'typical' image you have of your dad

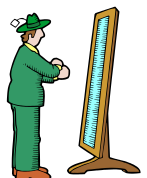
	1	2	3	4	5	6	7
Healthy	1	2	3	4	5	6	7
Exciting	1	2	3	4	5	6	7
Popular	1	2	3	4	5	6	7
Immature	1	2	3	4	5	6	7
"Cool" (sophisticated)	1	2	3	4	5	6	7
Unattractive	1	2	3	4	5	6	7
Independent	1	2	3	4	5	6	7
Careless	1	2	3	4	5	6	7
Glamorous	1	2	3	4	5	6	7
Dull (boring)	1	2	3	4	5	6	7
Good Looking	1	2	3	4	5	6	7
Dirty	1	2	3	4	5	6	7
Successful	1	2	3	4	5	6	7
Unhealthy	1	2	3	4	5	6	7
Uncool	1	2	3	4	5	6	7
Leader	1	2	3	4	5	6	7

We are also interested in how similar you feel you are to your dad. Please answer the question below:



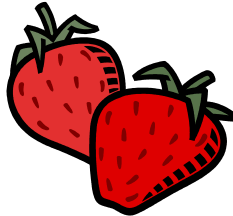
**40.** In general, how similar do you feel you are to your dad?

Not at all    1    2    3    4    5    6    7    Extremely





# The Health Perceptions Questionnaire



## *PART D ~ Healthy Eating*

### **Instructions**

This part of the questionnaire is interested in your eating behaviours.

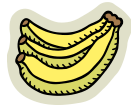
Please answer as honestly as possible, by circling what you think is the most relevant answer for yourself, unless it states otherwise.

Remember, all answers will be kept completely confidential.

*Thank you for your help.*

## Section 1

As before, a healthy diet would include lots of fruit and vegetables, pasta, potatoes, rice, and fish, and a low intake of fatty or sugary foods, such as chips, burgers, chocolate, cakes and so on.



1. How do you think of yourself?

- Very underweight
- Slightly underweight
- About the right weight
- Slightly overweight
- Very overweight

2. How satisfied are you with your current body shape and size?

- Very satisfied
- Satisfied
- Neither satisfied nor dissatisfied
- Partly dissatisfied
- Very dissatisfied

3. How often do you try to eat a healthy diet?

- Rarely
- Sometimes
- Most times
- Always

4. In the last week how often did you....

(please tick <b>one</b> for each item)	Every-day	Almost everyday	2-3 times	Once	Rarely/ Never
Try to eat healthy foods?					
Eat breakfast?					
Eat lunch?					
Eat dinner?					
Eat between meals (snacks)?					
Have a takeaway meal?					

## Section 2

### Instructions

The next few questions concern your images of people. You have seen questions like this before asking about how you would describe yourself and your parents-remember!

What we are interested in, are your ideas about typical members of different groups. For example, we all have ideas about what typical movie stars are like or what the typical grandmother is like. When asked to describe one of these images-we might say we think the typical movie star is pretty and rich, or that the typical grandmother is sweet and frail. We are not saying that all movie stars or all grandmothers are exactly alike, but rather that many of them share certain characteristics.

Here we are interested in how you perceive the image of a typical person of the **same age as yourself** who eats healthily.

Could you please give us your opinion of the typical image for the health behaviour below by stating how closely each of the 16 adjectives describes the typical image. Please could you circle the number you feel best represents the image, from 1 meaning 'not at all' to 7 meaning 'extremely'. Please ensure you give your opinion on every descriptive statement.

### 5. Describe the 'typical' young person (your age) who eats healthily

	Not at all	1	2	3	4	5	6	7	Extremely
Healthy	1	2	3	4	5	6	7		
Exciting	1	2	3	4	5	6	7		
Popular	1	2	3	4	5	6	7		
Immature	1	2	3	4	5	6	7		
"Cool" (sophisticated)	1	2	3	4	5	6	7		
Unattractive	1	2	3	4	5	6	7		
Independent	1	2	3	4	5	6	7		
Careless	1	2	3	4	5	6	7		
Glamorous	1	2	3	4	5	6	7		
Dull (boring)	1	2	3	4	5	6	7		
Good Looking	1	2	3	4	5	6	7		
Dirty	1	2	3	4	5	6	7		
Successful	1	2	3	4	5	6	7		
Unhealthy	1	2	3	4	5	6	7		
Uncool	1	2	3	4	5	6	7		
Leader	1	2	3	4	5	6	7		

We are also interested in how similar you feel you are to the typical person who eats healthily. Please answer the question below:

### 6. In general, how similar do you feel you are to this typical person who eats healthily?

Not at all    1    2    3    4    5    6    7    Extremely

### Section 3

#### Instructions

We would like to learn about how important you feel eating behaviours are to your present and future health. There are no right or wrong answers, however we would like you to answer the way you really feel, and not the way you think you should feel. Please answer all questions by circling the number that you think best explains how you feel.

7. How important do you think eating a healthy diet is to your **present** health?

**Not very important**    1    2    3    4    5    **Very important**

8. How important do you think eating a healthy diet is to your **future** health?

**Not very important** 1    2    3    4    5    **Very important**

### Section 4

#### Instructions

Now we are interested in how certain you are that you could overcome the following barriers:

Please circle one answer for each statement only. Please do not leave any unanswered.

- |   | Not at all | Barely true | Somewhat true | Very true |
|---|------------|-------------|---------------|-----------|
| 9. I am confident that I can stick to healthy foods even if I need a long time to develop the necessary routines                                | 1          | 2           | 3             | 4         |
| 10. I am confident that I can stick to healthy foods even if I have to try several times until it works   | 1          | 2           | 3             | 4         |
| 11. I am confident that I can stick to healthy foods even if I have to rethink my entire way of nutrition                                       | 1          | 2           | 3             | 4         |
| 12. I am confident that I can stick to healthy foods even if I do not receive a great deal of support from others when making my first attempts | 1          | 2           | 3             | 4         |
| I am confident that I can stick to healthy foods even if I have to make a detailed plan   | 1          | 2           | 3             | 4         |

## Section 5

### Instructions

Now we would like to learn about how you feel about healthy eating.

Please circle the number you feel best explains how you feel for each statement. Please do not leave any unanswered.

**13.** I intend to stick to a healthy diet for the next week

Definitely do not    1    2    3    4    5    6    7    Definitely do

**14.** If I stick to a healthy diet for the next week it would be:

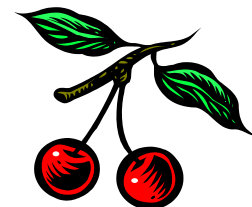
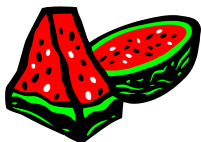
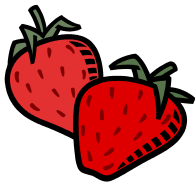
- |                  |   |   |   |   |   |   |   |            |              |
|------------------|---|---|---|---|---|---|---|------------|--------------|
| (i) Bad          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Good       | .....for me. |
| (ii) Harmful     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Beneficial | .....for me. |
| (iii) Unpleasant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Pleasant   | .....for me. |
| (iv) Unenjoyable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Enjoyable  | .....for me. |
| (v) Foolish      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Wise       | .....for me. |

**15.** If I stick to a healthy diet for the next week it would make me healthier

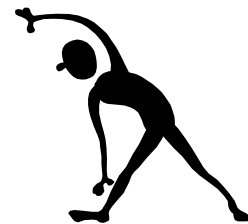
Unlikely    1    2    3    4    5    6    7    Likely

**16.** Being healthier as a result of sticking to a healthy diet would be:

Bad    1    2    3    4    5    6    7    Good



# The Health Perceptions Questionnaire



## *PART E ~ Exercise*

### **Instructions**

This part of the questionnaire is interested in your physical activity (this can include exercise during school lessons and walking).

Please answer as honestly as possible by circling what you think is the most relevant answer for yourself, unless it states otherwise.

Remember, all answers will be kept completely confidential!

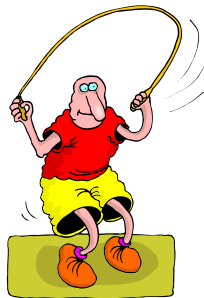
*Thank you for your help.*

## Section 1

1. How many times in **the last week** did you do any type of physical activity described below for at least 30 minutes that made you breathe hard and sweat?



(please tick <b>one</b> for each item)	Number of times			
	0	1-2	3-5	6 +
Sports or sports training, (e.g. basketball, tennis, netball, football,)				
Vigorous physical activities or exercise, (e.g. fast-walking, weight training, jogging, fast dancing, roller-blading, bike riding or similar aerobic activity)				
Other physical activities that made you sweat and breathe hard, (e.g. physical work, walking)				



## Section 2

### Instructions

The next few questions are about your images of people. You have seen questions like this before regarding eating behaviours-remember! Again we are interested in your ideas about typical members of different groups.

Here we are interested in how you perceive the image of a typical person of the **same age as yourself** who exercises regularly.

Could you please give us your opinion of the typical image for the health behaviour below by stating how closely each of the 16 adjectives describes the typical image. Please could you circle the number you feel best represents the image, from 1 meaning 'not at all' to 7 meaning 'extremely'. Please ensure you give your opinion on every descriptive statement.

### 2. Describe the 'typical' young person (your age) who exercises regularly

	Not at all	1	2	3	4	5	6	7	Extremely
Healthy	1	2	3	4	5	6	7		
Exciting	1	2	3	4	5	6	7		
Popular	1	2	3	4	5	6	7		
Immature	1	2	3	4	5	6	7		
"Cool" (sophisticated)	1	2	3	4	5	6	7		
Unattractive	1	2	3	4	5	6	7		
Independent	1	2	3	4	5	6	7		
Careless	1	2	3	4	5	6	7		
Glamorous	1	2	3	4	5	6	7		
Dull (boring)	1	2	3	4	5	6	7		
Good Looking	1	2	3	4	5	6	7		
Dirty	1	2	3	4	5	6	7		
Successful	1	2	3	4	5	6	7		
Unhealthy	1	2	3	4	5	6	7		
Uncool	1	2	3	4	5	6	7		
Leader	1	2	3	4	5	6	7		

We are also interested in how similar you feel you are to the typical person who exercises regularly.

Please answer the question below:

### 3. In general, how similar do you feel you are to this typical person who exercises regularly?

Not at all    1    2    3    4    5    6    7    Extremely



### Section 3

#### Instructions

We would like to learn about how important you feel exercise is to your present and future health. There are no right or wrong answers, however we would like you to answer the way you really feel, and not the way you think you should feel. Please answer all questions by circling the number that you think best explains how you feel.

4. How important do you think exercising regularly is to your **present** health?

Not very important    1    2    3    4    5    Very important

5. How important do you think exercising regularly is to your **future** health?

Not very important    1    2    3    4    5    Very important

### Section 4

#### Instructions

Now we are interested in how certain you are that you could overcome the following barriers

Please circle **one** answer for each statement only. Please do not leave any unanswered.

	Not at all	Barely true	Somewhat true	Very true
6. I am confident that I can exercise regularly even when my friends want me to do something else	1	2	3	4
7. I am confident that I can exercise regularly even if I feel sad	1	2	3	4
8. I am confident that I can exercise regularly even if I have to make a detailed plan on when I will do it	1	2	3	4
9. I am confident that I can exercise regularly even when I am tired	1	2	3	4
10. I am confident that I can exercise regularly even when I am busy	1	2	3	4

## Section 5

### Instructions

Now we would like to learn about how you feel about exercise and physical activity.

Please circle the number you feel best explains how you feel for each statement. Please do not leave any unanswered.

- 11.** I intend to be physically active for at least 30 minutes every day for the next week

Definitely do not    1    2    3    4    5    6    7    Definitely do

- 12.** If I am physically active for at least 30 minutes every day in the next week it would be:

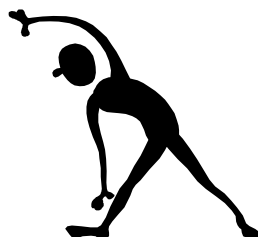
- |                  |   |   |   |   |   |   |   |            |             |
|------------------|---|---|---|---|---|---|---|------------|-------------|
| (i) Bad          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Good       | .....for me |
| (ii) Harmful     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Beneficial | .....for me |
| (iii) Unpleasant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Pleasant   | .....for me |
| (iv) Unenjoyable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Enjoyable  | .....for me |
| (v) Foolish      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Wise       | .....for me |

- 13.** If I am physically active for at least 30 minutes every day in the next week it would make me healthier

Unlikely    1    2    3    4    5    6    7    Likely

- 14.** Being healthier as a result of being physically active would be:

Bad    1    2    3    4    5    6    7    Good



# The Health Perceptions Questionnaire



## *PART F ~ Smoking Cigarettes*

### Instructions

This part of the questionnaire is interested in your smoking behaviours.

Please answer as honestly as possible by circling what you think is the most relevant answer for yourself, unless it states otherwise.

Remember, all answers will be kept completely confidential!

When we refer to smoking a cigarette, we mean the use of tobacco.

*Thank you for your help.*

## Section 1

1. Have you **ever** smoked even part of a cigarette?

No (please go to section 2)

Yes, just a few puffs

Yes, I have smoked **less** than 10 cigarettes in my life

Yes, I have smoked **more** than 10 cigarettes in my life

Yes, I have smoked **more** than 100 cigarettes in my life



2. Have you smoked cigarettes in the **last week**?

Yes

No

3. Do you usually smoke cigarettes each day?



Yes

No

4. If yes to question 3, how many cigarettes do you usually smoke in a day?

.....cigarettes



5. Have you smoked more than 10 cigarettes in the last 12 months?

Yes (please continue)

No (Go to section 2)

6. In the last 12 months, have you **tried** to quit smoking?

Yes

No

7. In the last 12 months, how many times have you tried to quit smoking for a **week or more**?

None

Once

Twice

Three times or more



## Section 2

### Instructions

The next few questions concern your images of people. You have seen questions like this before, I'm sure you remember by now! Again we are interested in your ideas about typical members of different groups.

Here we are interested in how you perceive the image of a typical person of the **same age as yourself** who smokes cigarettes.

Could you please give us your opinion of the typical image for the health behaviour below by stating how closely each of the 16 adjectives describes the typical image. Please could you circle the number you feel best represents the image, from 1 meaning 'not at all' to 7 meaning 'extremely'. Please ensure you give your opinion on every descriptive statement.

### 8. Describe the 'typical' young person (your age) who smokes cigarettes

	Not at all	1	2	3	4	5	6	7	Extremely
Healthy	1	2	3	4	5	6	7		
Exciting	1	2	3	4	5	6	7		
Popular	1	2	3	4	5	6	7		
Immature	1	2	3	4	5	6	7		
"Cool" (sophisticated)	1	2	3	4	5	6	7		
Unattractive	1	2	3	4	5	6	7		
Independent	1	2	3	4	5	6	7		
Careless	1	2	3	4	5	6	7		
Glamorous	1	2	3	4	5	6	7		
Dull (boring)	1	2	3	4	5	6	7		
Good Looking	1	2	3	4	5	6	7		
Dirty	1	2	3	4	5	6	7		
Successful	1	2	3	4	5	6	7		
Unhealthy	1	2	3	4	5	6	7		
Uncool	1	2	3	4	5	6	7		
Leader	1	2	3	4	5	6	7		

We are also interested in how similar you feel you are to the typical person who smokes cigarettes. Please answer the question below:

### 9. In general, how similar do you feel you are to this typical person who smokes cigarettes?

Not at all    1    2    3    4    5    6    7    Extremely

## Section 3

### Instructions

We would like to learn about how important you feel smoking behaviours are to your present and future health. There are no right or wrong answers, however we would like you to answer the way you really feel, and not the way you think you should feel. Please answer all questions by circling the number that you think best explains how you feel.

10. How important do you think avoiding smoking cigarettes is to your **present** health?

Not very important    1    2    3    4    5    Very important

11. How important do you think avoiding smoking cigarettes is to your **future** health?

Not very important    1    2    3    4    5    Very important

## Section 4

### Instructions

For this question, please reply to **one statement only** by circling one answer :

Answer question 12 if you have **never** smoked a cigarette

Answer question 13 if you have smoked **in the past** but do not smoke now

Answer question 14 if you do **currently** smoke

	Not at all	Barely true	Somewhat true	Very true
12. I am confident that I can control myself to never smoke a cigarette at all	1	2	3	4
13. I am confident that I can control myself never to smoke a cigarette again, even if my friends smoke	1	2	3	4
14. I am confident that I can quit smoking, even if I do not receive a great deal of support from others when making my first attempts	1	2	3	4

## Section 5

### Instructions

Now we would like to learn about how you feel about smoking. Please complete this page even if you have never smoked a cigarette.

Please circle the number you feel best explains how you feel for each statement. Please do not leave any unanswered.

**15.** I intend to avoid smoking a cigarette over the next week

Definitely do not    1    2    3    4    5    6    7    Definitely do

**16.** If I avoid smoking a cigarette over the next week, it would be:

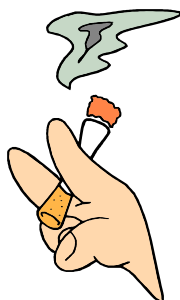
- |                  |   |   |   |   |   |   |   |            |             |
|------------------|---|---|---|---|---|---|---|------------|-------------|
| (i) Bad          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Good       | .....for me |
| (ii) Harmful     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Beneficial | .....for me |
| (iii) Unpleasant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Pleasant   | .....for me |
| (iv) Unenjoyable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Enjoyable  | .....for me |
| (v) Foolish      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Wise       | .....for me |

**17.** If I avoid smoking a cigarette over the next week it would make me healthier

Unlikely    1    2    3    4    5    6    7    Likely

**18.** Being healthier as a result of not smoking cigarettes would be:

Bad    1    2    3    4    5    6    7    Good



# The Health Perceptions Questionnaire



## *PART G ~ Alcohol Consumption*

### **Instructions**

This part of the questionnaire is interested in your alcohol consumption.

Please answer as honestly as possible by circling what you think is the most relevant answer for yourself, unless it states otherwise.

Remember, all answers will be kept completely confidential!

When we refer to alcohol consumption, we mean to drink a unit of anything alcoholic-This would include a glass of wine, a pint of beer, an alcopop, a shot of vodka/brandy, a cocktail, etc.

*Thank you for your help.*



## Section 1

1. Have you **ever** had even part of an alcoholic drink?

No (please go to section 2)

Yes, just a few sips

Yes, I've had less than 10 alcoholic drinks in my life

Yes, I've had more than 10 alcoholic drinks in my life



2. Have you had an alcoholic drink in the **last week**?

Yes

No

3. Have you ever been drunk at any time in the last 6 months?

Yes

No



4. Have you ever drunk so much that you threw up (vomited)?

Yes

No

5. Think back over the last **2 weeks**. How many times have you had **3** or more drinks on any one occasion?

None

Once

Twice

3-6 times

7 or more times



6. Think back over the last **2 weeks**. How many times have you had **5** or more drinks on any one occasion?

None

Once

Twice

3-6 times

7 or more times



## Section 2

### Instructions

The next few questions concern your images of people. You have seen questions like this before, I'm sure you remember by now! Again we are interested in your ideas about typical members of different groups.

Here we are interested in how you perceive the image of a typical person of the **same age as yourself** who drinks alcohol.

Could you please give us your opinion of the typical image for the health behaviour below by stating how closely each of the 16 adjectives describes the typical image. Please could you circle the number you feel best represents the image, from 1 meaning 'not at all' to 7 meaning 'extremely'. Please ensure you give your opinion on every descriptive statement.

### 7. Describe the 'typical' young person (your age) who drinks alcohol

	1	2	3	4	5	6	7
	Not at all 1 ←-----→ 7 Extremely						
Healthy	1	2	3	4	5	6	7
Exciting	1	2	3	4	5	6	7
Popular	1	2	3	4	5	6	7
Immature	1	2	3	4	5	6	7
"Cool" (sophisticated)	1	2	3	4	5	6	7
Unattractive	1	2	3	4	5	6	7
Independent	1	2	3	4	5	6	7
Careless	1	2	3	4	5	6	7
Glamorous	1	2	3	4	5	6	7
Dull (boring)	1	2	3	4	5	6	7
Good Looking	1	2	3	4	5	6	7
Dirty	1	2	3	4	5	6	7
Successful	1	2	3	4	5	6	7
Unhealthy	1	2	3	4	5	6	7
Uncool	1	2	3	4	5	6	7
Leader	1	2	3	4	5	6	7

We are also interested in how similar you feel you are to the typical person who drinks alcohol. Please answer the question below:

### 8. In general, how similar do you feel you are to this typical person who drinks alcohol?

Not at all    1    2    3    4    5    6    7    Extremely

### Section 3

#### Instructions

We would like to learn about how important you feel alcohol consumption is to your present and future health. There are no right or wrong answers, however we would like you to answer the way you really feel, and not the way you think you should feel. Please answer all questions by circling the number that you think best explains how you feel.

9. How important do you think avoiding drinking alcohol is to your **present** health?

Not very important   1   2   3   4   5   Very important

10. How important do you think avoiding drinking alcohol is to your **future** health?

Not very important   1   2   3   4   5   Very important

### Section 4

#### Instructions

For this question, please reply to **one statement only** by circling one answer:

Answer question 11 if you have **never** consumed any alcohol

Answer question 12 if you have consumed alcohol in **the past**

	Not at all	Barely true	Somewhat true	Very true
11. I am confident that I can control myself to never drink alcohol at all	1	2	3	4
12. I am confident I can control myself to only drink alcohol at special occasions	1	2	3	4

## Section 5

### Instructions

Now we would like to learn about how you feel about drinking alcohol. Please complete this page even if you have never drunk alcohol before.

Please circle the number you feel best explains how you feel for each statement. Please do not leave any unanswered.

**13.** I intend to avoid drinking alcohol over the next week

Definitely do not    1    2    3    4    5    6    7    Definitely do

**14.** If I avoid drinking alcohol over the next week, it would be:

- |                  |   |   |   |   |   |   |   |            |             |
|------------------|---|---|---|---|---|---|---|------------|-------------|
| (i) Bad          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Good       | .....for me |
| (ii) Harmful     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Beneficial | .....for me |
| (iii) Unpleasant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Pleasant   | .....for me |
| (iv) Unenjoyable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Enjoyable  | .....for me |
| (v) Foolish      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Wise       | .....for me |

**15.** If I avoid drinking alcohol over the next week it would make me healthier

Unlikely    1    2    3    4    5    6    7    Likely

**16.** Being healthier as a result of not drinking alcohol would be:

Bad    1    2    3    4    5    6    7    Good



# THANK YOU SO MUCH!!!



You did me a really big favour spending your time on these questionnaires.

Without help from people such as yourself, research such as this would never be possible, therefore I would like to express my sincere thanks and gratitude to you for your help.

The information you gave will help to learn more about what behaviours young people like yourself do, and how they feel about such behaviours and their health.

If you are interested in the results of this study or have any further questions, please do not hesitate to contact me on 01582 489217 or e-mail me at; [angel.chater@luton.ac.uk](mailto:angel.chater@luton.ac.uk)


As soon as this study is finished, your school will get a copy of the overall findings-all anonymous of course!!

I hope you enjoyed taking part in my study.


Thank you again



## Appendix B: Standardised Instructions for the HPQ



University of Luton



### Thank you for agreeing to be in my study looking at perceptions of health

- \* Please could you start by writing your full name on one of the reference codes attached to your envelope and hand it back to your teacher who will give it to me.
- \* Could you then make sure you write this code on the top of each questionnaire you fill in.
- \* It is important you answer all of the questions in each of the booklets unless it tells you otherwise.
- \* You have an envelope to put your completed questionnaires in so no-one will see your answers.
- \* You can withdraw from this study at any time.
- \* Finally, please could you take the tick sheet at the back home with you and fill it in over the next week.

## **Appendix C: British Heart Foundation Magazines**

**Be ACTIVE**



## HACK

## **INTAKE**

## **Appendix D: Health Behaviour Schedules**

Time 1 (pre-intervention)

Time 2 (post-intervention)

Ref. Code.....

**Instructions**

*Please take this tick sheet home with you and fill it in over the next week starting from today. Please remember to fill in your reference code above before you give the questionnaires back!*

**Weekly Tick Chart (T1 - time 1)**

<b>Targets</b> ↓	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
To stick to healthy foods							
To be physically active for at least 30 minutes everyday							
To avoid smoking a cigarette							
To avoid drinking alcohol							

For each day over the next seven days (starting from the day you filled in the questionnaires, please could you:

put a tick if you reach the target



And a cross if you don't

**Instructions**

*Please take this tick sheet home with you and fill it in over the next week starting from today. Please remember to fill in your reference code above before and bring it back next week!*

**Weekly Tick Chart (T2 – time 2)**

Targets ↓	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
To stick to healthy foods							
To be physically active for at least 30 minutes everyday							
To <b>avoid</b> smoking a cigarette							
To <b>avoid</b> drinking alcohol							

For each day over the next seven days (starting from the day you filled in the questionnaires, please could you:

put a tick if you reach the target



And a cross if you don't

You can put 2 ticks the day after a cross to 'make up' for not reaching the target that day.

It might also help to write down with the cross, reasons why you couldn't make the target that day, and how it made you feel. You can use the back of this sheet if there is not enough room-just remember to write what day you are referring to.

## **Appendix E: Standardised Intervention Dialogue**

Introduction positive frame

Introduction negative frame

## **Introduction – Positive Frame**

We are here today to look at behaviours that keep us healthy.

If you remember from the questionnaire you filled in for me a few weeks ago, the behaviours I am interested in are healthy eating, exercise, not smoking cigarettes and not drinking alcohol.

First we are going to watch a video about these behaviours. When you are watching this video, I want you to concentrate on the behaviours that keep you healthy.

After this, we will have a quiz and a discussion about how these behaviours can keep you healthy.

Finally, I would like you to fill in some questions like the ones from the first questionnaire on these behaviours.

Does anyone have any questions??

## **Introduction – Negative Frame**

We are here today to look at behaviours that may make us unhealthy.

If you remember from the questionnaire you filled in for me a few weeks ago, the behaviours I am interested in are unhealthy eating, lack of exercise, smoking cigarettes and drinking alcohol.

First we are going to watch a video about these behaviours. When you are watching this video, I want you to concentrate on the behaviours that could make you unhealthy.

After this, we will have a quiz and a discussion about how these behaviours could make you unhealthy.

Finally, I would like you to fill in some questions like the ones from the first questionnaire on these behaviours.

Does anyone have any questions??



## **Appendix F: Health Behaviour Quiz**

Quiz questions

Quiz answers and explanation

## Health Behaviour Quiz Questions

Q1. Carrying out exercise in small bursts of 10 minutes three times a day, is as beneficial to you as exercising for 30 minutes in one go?

- a. True
- b. False

Q2. An apple a day keeps the doctor away?

- a. True
- b. False

Q3. A poor diet is estimated to be a factor in the development of one third of all cancers.

- a. True
- b. False

Q4. How many organs of the body can develop cancer as a result of smoking?

- a. One
- b. Twenty
- c. Seven

Q5. There are more than 4000 chemicals that go into cigarettes. Which of the following chemicals do you think come from cigarette smoke:

- a. acetic acid (vinegar)
- b. acetone (nail varnish remover)
- c. ammonia (cleaner)
- d. arsenic (poison)
- e. all of the above

Q6. Which of the following contains the most alcohol:

- a. a pint of export lager
- b. a triple vodka
- c. 2 bottles of Bacardi Breezer
- d. none of the above-they're all the same

Q7. Which drug kills more people per year?

- a. heroin
- b. alcohol
- c. cocaine
- d. ecstasy

## Health Behaviour Quiz – Answers

Q1. Carrying out exercise in small bursts of 10 minutes three times a day, is as beneficial to you as exercising for 30 minutes in one go?

A. a - True!

Yes-carrying out small bursts of exercise throughout the day is just as beneficial as exercising for one hour in one go. So a 10 minute walk to school and 10 minute walk home and a quick physically active game at lunchtime would all contribute to your daily exercise.

Q2. An apple a day keeps the doctor away?

A. b - False!

It is recommended that we all try to eat 5 portions of fruit and vegetables a day. One portion is a piece of fruit, a bowl of salad, two spoonfuls of vegetables or a glass of fruit juice. The fruit and vegetables can be fresh, frozen or tinned!

Q3. A poor diet is estimated to be a factor in the development of one third of all cancers.

A. a - True!

The risk of certain cancers is lower in people who eat lots of vegetables, fruits and starchy foods and higher in people who are overweight, drink too much alcohol or who eat too much of red and processed meats.

Q4. How many organs of the body can develop cancer as a result of smoking?

- a. One
- b. Twenty
- c. Seven

A. c! Seven

In addition to lung cancer smoking can lead to cancer of the throat, mouth, bladder, kidney, stomach and pancreas.

Q5. There are more than 4000 chemicals that go into cigarettes. Which of the following chemicals do you think come from cigarette smoke:

- a. acetic acid (vinegar)
- b. acetone (nail varnish remover)
- c. ammonia (cleaner)
- d. arsenic (poison)
- e. all of the above

A. e! All of these chemicals come from cigarette smoke.

Q6. Which of the following contains the most alcohol:

- a. a pint of export lager
- b. a triple vodka
- c. 2 bottles of Bacardi Breezer
- d. none of the above-they're all the same

A. d – all of these drinks contain 3 units of alcohol.

Q7. Which drug kills more people per year?

- a. heroin
- b. alcohol
- c. cocaine
- d. ecstasy

A. b – Alcohol! 5,000 people die each year directly because of alcohol, and a further 33,000 people die a year due to an alcohol related death. 3,000 people die per year due to illegal drug use.

## **Appendix G: Intervention Discussion Sheets**

Benefits of health behaviours

Costs of unhealthy behaviours

## **Benefits of Healthy Behaviours**

“In your groups I want you to answer the following question...

...What are the benefits to your health if you eat healthy foods, take regular exercise, and don't smoke or drink alcohol?”

## **Costs of Unhealthy Behaviours**

“In your groups I want you to answer the following question...

...What are the costs to your health if you don't eat healthy foods or take regular exercise, and you smoke or drink alcohol?”

What type of barriers are there to health behaviours.

## **Appendix H: Standardised Visualisation Dialogue**

Visualisation positive frame

Visualisation negative frame



## **Visualisation – Positive Frame**

Now I want you to close your eyes and think about your average day from morning to night. I want you to visualise you're performing the things we have been talking about today to keep you healthy.

Think about when you wake up in the morning-visualise yourself eating a healthy breakfast such as cereal or toast and a piece of fruit. Bananas always go down well at breakfast time!

Then, visualise yourself walking to school – if you walk with friends, have a race to see who gets there the fastest – this will get your heart active!

At lunchtime, choose the healthy options for lunch – go for potatoes or pasta instead of chips, and fish or chicken instead of burgers – and try to eat at least one portion of fruit and veg all washed down with a glass of fruit juice.

After lunch, join in with a game of football or run-outs on the school field, get that heart pumping again!

Finally, take a brisk walk home and help mum or dad prepare dinner. Again, try to go for a healthy dinner. If you have at least one portion of fruit or veg with dinner you would have hit the 5 a day mark! All good for keeping you healthy!

After dinner, instead of sitting down in front of Neighbours or Hollyoaks, go down the park with your mates, or help mum or dad with the housework – whatever you do – keep active. Not only will this help you stay healthy and keep your social life going or your mum or dad happy – it will also help you have a good nights sleep!

If you are ever offered a cigarette or alcohol, or tempted to try it, I want you to remember how important not smoking and drinking is to your health, and visualise yourself saying no and being healthier from not performing these behaviours.

## **Visualisation – Negative Frame**

Now I want you to close your eyes and think about your average day from morning to night. I want you to visualise you're performing the things we have been talking about today to stop you becoming unhealthy.

Think about when you wake up in the morning-visualise yourself eating a healthy breakfast such as cereal or toast and a piece of fruit. Bananas always go down well at breakfast time!

Then, visualise yourself walking to school – if you walk with friends, have a race to see who gets there the fastest – this will get your heart active!

At lunchtime, choose the healthy options for lunch – go for potatoes or pasta instead of chips, and fish or chicken instead of burgers – and try to eat at least one portion of fruit and veg all washed down with a glass of fruit juice.

After lunch, join in with a game of football or runouts on the school field, get that heart pumping again!

Finally, take a brisk walk home and help mum or dad prepare dinner. Again, try to go for a healthy dinner. If you have at least one portion of fruit or veg with dinner you would have hit the 5 a day mark! All good for reducing your risk of becoming unhealthy!

After dinner, instead of sitting down in front of Neighbours or Hollyoaks, go down the park with your mates, or help mum or dad with the housework – whatever you do – keep active. Not only will this reduce the risk of becoming unhealthy and keep your social life going or your mum or dad happy – it will also help you have a good nights sleep!

If you are ever offered a cigarette or alcohol, or tempted to try it, I want you to remember how smoking and drinking is related to poor health, and visualise yourself saying no and avoiding becoming unhealthy through not performing these behaviours.

## Appendix I: Action Plan Sheet

Ref. Code.....

### *Action Plan Sheet*

Targets	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
I intend to stick to healthy foods for the next week							
I intend to be physically active for at least 30 minutes everyday for							
I intend to avoid smoking a cigarette over the next week							
I intend to avoid drinking alcohol over the next week							

