Northumbria Research Link

Increasing Acceptance of Online Health

Information: Understanding Barriers,

Tailoring Messages and Self-Affirmation

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Increasing Acceptance of Online Health Information: Understanding Barriers, Tailoring Messages and Self-Affirmation

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Abstract

The majority of deaths worldwide can now be attributed to so called, diseases of lifestyle, also known as non-communicable diseases (NCDs). These diseases are generally attributed to lifestyle behaviours, such as low fruit and vegetable consumption and lack of physical activity. Whilst historically NCDs have been known as diseases of the rich, current evidence shows that they are most prevalent in individuals with low socio-economic status. This thesis sets out to specifically address this issue by recruiting participants from a low SES population, in order to develop and test a web-based intervention addressing lifestyle behaviours.

Initially the research identifies, and explores the barriers experienced by low SES individuals to leading healthy lifestyles, through interview data and further Q-sort analysis. The findings from these studies are used to tailor a health message, making it more pertinent to the target audience; the resulting message is incorporated into a website. The website is developed by understanding what constitutes a credible health related site in the eyes of the target audience.

The Internet is an increasingly popular mode by which to deliver health interventions. The reasons for this include; reducing costs, increasing convenience for users, reaching isolated or stigmatised groups and the timeliness of access to the Internet. It is well known that simply presenting health information does little to actually change individuals' behaviour, both in online and off line contexts. This thesis uses self-affirmation manipulations to increase the acceptance of the web-based health message.

Self-affirmation theory (Steele, 1988) posits that reflecting on one's positive attributes, reduces defensiveness to a potentially threatening health message. A recent study (Epton and Harris, 2008) suggests self-affirmation can lead to an actual change in the behaviour of individuals. This thesis replicates the work of Epton and Harris (2008) in an online environment, by demonstrating self-affirmed participants consumed more fruit and vegetable in the 7 days following exposure to the tailored website. These findings highlight the barriers experienced by low SES parents to adopting healthy lifestyles, and present a novel technique suitable for web-based interventions that has implications for a range of health related behaviours.

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Acknowledgements

Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges opinions, ideas and contributions from the work of others.

Any ethical clearance for research presented in this thesis has been approved. Approval has been sought and granted by the School Ethics Committee for each study.

Name:

Signature:

Date:

Chapter 1: Changing Behaviour Online

The central argument in this thesis is the Internet is a valuable means to deliver information pertaining to health related behaviours and that using a technique, self-affirmation, can improve the likelihood information will be accepted and acted upon leading to a change in behaviour. The discussion in this chapter highlights individuals with low socio-economic status living in the North East of England are at the greatest risk of lifestyle related diseases because of their behaviours in relation to diet and physical activity. This chapter also demonstrates the Internet or computer based interventions provide a potential means of intervening in this group's behaviours that is low-cost, timely and avoids causing feelings of stigmatisation. What is more this chapter also posits that information presented on websites needs to be developed so it is viewed as credible and personally relevant to the target audience. The literature presented in this chapter and throughout this thesis was identified by adopting a systematic search to highlight as many relevant articles as possible. This involved the identification of key terms relevant to the themes of this thesis and a thorough search of online databases including PubMed, PubMed Central, Scirus, MEDLINE, PsychINFO, Science Direct, Web of Science and The Cochrane Library. Chapters 1 and 2 set the context for exploring these arguments. This chapter outlines the aims, objectives and provides a review of the original contribution this thesis makes to existing knowledge.

1.1 Context of thesis

Over the last century much advancement has been made both in the treatment of illnesses and the prevention of disease through both vaccination and health promotion. Whilst this has meant the virtual eradication of many potentially fatal health conditions and the increase in longevity for many of the world's populations, the majority of deaths worldwide can now be attributed to so called, diseases of lifestyle, also known as non-communicable diseases (NCDs). NCDs refer to diseases that by definition are non-infectious and non-transmissible between individuals. NCDs may be chronic diseases of long duration and slow progression such as cancer or heart disease, or they may result in more rapid death such as a sudden stroke. NCDs, according to the WHO (2010), are responsible for more deaths

worldwide than all other causes combined. It is estimated that in 2008, 63% of worldwide deaths could be attributed to NCDs (WHO, 2010).

Historically NCDs were known as diseases of the rich, because they often associated with economic development. However, an interesting phenomenon with regard to the incidence rates of NCDs in the present day is they also reflect the continuing issue of health inequalities of those living in deprived communities. There is an established association between SES (Socio-Economic Status) and mortality, and its common causes (White, Edgar and Siegler, 2008). SES is a term typically used to identify a person's standing relative to others based on characteristics such as educational attainment, income, occupation, and where they live (White et al., 2008). Individuals with low SES are most at risk of developing diseases or illness that are a result of lifestyle choices (see Figure 1.1). It is important to note when considering the data White et al., (2008) present, it doesn't include individuals who have been unemployed for more than a year or who have never been in employment. Gardener and Oswald (2004) highlight individuals who constitute the long term unemployed have higher mortality than those in employment currently, or, who have been recently employed. This may mean those in potentially the most deprived circumstances are not represented in these data. In addition, the data presented is for men, however, of the half a million people who's death can be attributed to an NCD in the UK in 2008, over 250,000 of them were women (WHO, 2011) and the distribution of these deaths across the social classes follows a similar pattern.
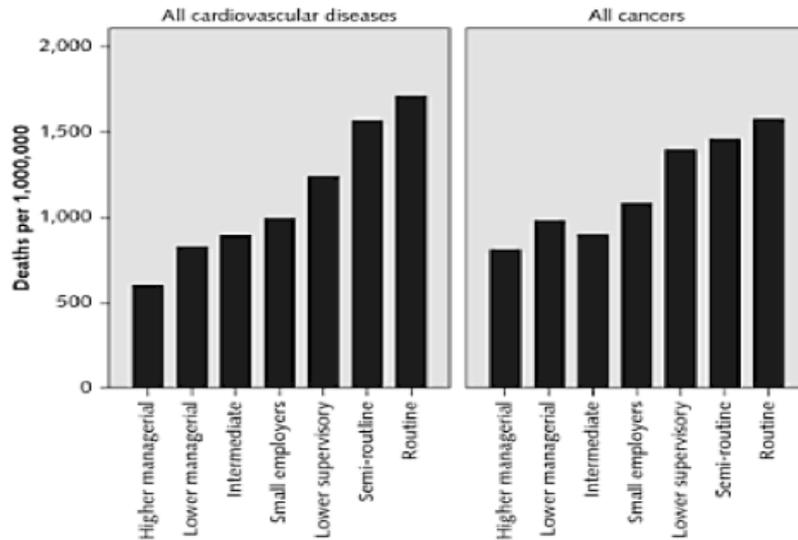
Figure 1.1 The relationship between occupational social class and age adjusted deaths attributed to cardiovascular diseases or cancer among men aged 25-64 in England and Wales. Occupational social class is measured using the National Statistics Socioeconomic Classification (NS-SEC). White, Edgar and Siegler, (2008).

Whilst the relationship between SES and health outcomes exists, it is not a direct cause of mortality. SES can be seen as a predictor of certain health outcomes however the underlying causes are associated with our lifestyles and behaviours. Research has identified that lifestyles choices and behaviours play an important part in health outcomes (Adler & Ostrove, 1999). These behaviours include tobacco use, unhealthy diets-including low fruit and vegetable consumption, insufficient physical activity and the harmful use of alcohol. The increased incidence of these types of lifestyle choices in socio-economically deprived individuals is likely to explain some of the increased mortality rates from NCDs in individuals with low SES.

These behaviours are associated with negative outcomes to the individual such as morbidity, mortality, discrimination and social exclusion. In addition there are significant wider societal issues that need to be considered such as the health and social care costs associated with the treatment of NCDs and the wider impact that they have. Whilst the total costs of NCDs to an economy are very difficult to establish, it is estimated by the WHO (2010) the income lost to the UK economy between 2005 and 2015 will total $33 million. In addition the direct and associated costs of treating NCDs form a significant proportion of government spending. For example in 2002, the costs of obesity to the UK are estimated to have been approaching £7 million (Department of Innovation, Universities and Skills, 2007),

and the direct cost of treating obesity was estimated to be between £991 and £1,124 million, for the 2001/2002 financial year (McCormick & Stone, 2007). Luengo-Fernández, Leal, Gray, Petersen and Rayner (2006) put the costs of cardio-vascular disease (CVD), the UK economy in 2004 at £29.1 billion. Health care accounted for the largest proportion of costs at 60% with productivity losses due to mortality and morbidity, accounting for 23%, with the remaining 17% due to informal care-related costs.

Individuals with low-SES will be the target of the intervention this thesis develops and tests for the reasons outlined above and discussed in more detail in the following section. Further information about the participants in this thesis will be given in section 1.4.1 of this chapter

1.2 Physical activity and fruit and vegetable consumption

The two behaviours relevant to NCDs this thesis will consider are fruit and vegetable consumption and physical activity levels. Both of these behaviours are associated with NCDs such as some types of cancer, stroke, cardiovascular disease, diabetes, and obesity-which in itself is associated with NCDs.

1.2.1 Physical activity

Individuals who partake in regular exercise can benefit from a wide range of positive outcomes. The most obvious is the link between physical activity and weight, since obesity arises from an imbalance between energy intake and energy expenditure. Physical activity can help prevent weight gain and also help reduce excessive weight. Individuals who are physically inactive are at risk of premature mortality in particular from coronary heart disease (CHD). In fact, the link between physical activity, CHD and death has been long established. Blair, Kohl, Gordon and Paffenbarger (1992) demonstrated inactive or less fit individuals were almost twice as likely to die from coronary heart disease than more fit and physically active individuals, this effect remained significant even when other factors were controlled for. It is thought that the positive effect of physical activity is due to a combination of influences on other risk factors for CHD such as high blood pressure, body

weight, blood cholesterol levels and Type II diabetes. What is more, physical activity is known to have a positive impact on psychological factors such as mood. Physically active individuals report feeling less tense, less anxious and less stressed than physically inactive individuals and also have a greater ability to cope with stress (Penedo & Dahn, 2005). Despite the vast amount of information regarding the positive benefits of physical activity levels in the UK remain low. The recommended levels for physical activity in the UK are 30 minutes of moderate intensity exercise, five times a week (The NHS Information Centre, Lifestyles Statistics, 2012). The most recent Lifestyle Statistics (The NHS Information Centre, 2012) reports figures from the 2008 Health Survey for England (HSE). This survey, found that in 2008 39% of men and 29% of women aged 16 and over, met the government's recommendations for physical activity, whilst this demonstrates a slight improvement since a previous survey in 1997, 32% and 21% respectively, the figures remain low.

1.2.2 Fruit and vegetable consumption

Low fruit and vegetable consumption is associated with heart disease and some cancers, studies have demonstrated individuals who consume more portions of fruits and vegetables are less likely to develop such diseases (Marmot, 2007; Peto, 2001). It is thought that the positive benefits of fruit and vegetable consumption are linked to their high fibre, nutrient rich and low-energy-density nature (Drewnowski, Almiron-Roig, Marmonier & Lluch, 2004). It is has also been suggested that some of the benefits of eating fruits and vegetables is derived from the fact individuals whose diet is rich in fruit and vegetables typically eat less fatty foods and have healthier diets than those whose consumption of fruit and vegetables is low (Drenowski et al., 2004). This means individuals who consume more portions of fruits and vegetables are likely to be of a healthy weight and thus experience the positive benefits associated with this. The WHO recommends an intake of at least 400g of fruit and vegetables per day. This has been converted to five 80g portions of fruit and vegetables a day with the suggestion that three of those portions are vegetables (WHO, 2004), a recommendation adopted in the UK. As with physical activity, despite the wealth of evidence supporting the benefits of fruit and vegetable consumption, average intake remains well below the recommended levels in the UK.

According to the The NHS Information Centre, Lifestyles Statistics (2012) the 2010 Health Survey for England reported that only 25% of adult men and 27% of adult women consumed the recommended five or more portions of fruit and vegetables per day. These results are similar to those reported in 2009, but are lower than in 2006, when 28% of men and 32% of women consumed at least five portions daily, this represents a worrying trend despite prolific dissemination through the media of the '5-a–day' message.

1.3 Socio-economic status and lifestyle behaviours

Evidence suggests that lower SES is positively correlated with a greater likelihood of experiencing the negative health outcomes outlined above. The following section explores this evidence in relation to physical activity levels and fruit and vegetable consumption in individuals with low SES.

1.3.1 Physical activity levels and SES

Of particular interest to this thesis is the relationship between SES and physical activity. Martinez-Gonzalez, Varo, Santos, De Irala, Gibney, Kearney and Martinez (2001) illustrate that both men and women with lower SES are less likely to engage in physical activity. The data from the 2008 Health Survey for England is also reported by the British Heart Foundation and the University of Oxford (Townsend, Bhatnagar, Wickramasinghe, Scarborough, Foster, & Rayner, 2012) to demonstrate the relationship between SES and physical activity levels (see Table 1.1). These data suggest that levels of physical activity are lower amongst individuals with lower household income in comparison to adults in higher quintiles of income.

Table 1.1 Self-reported age-standardised physical activity levels in adults, by sex and quintile of equivalised household income, Health Survey for England 2008. Source: Townsend et al., 2012.

	Highest	Second	Third	Fourth	Lowest
	%	%	%	%	%
Men					
Meets recommendations	42	41	42	39	31
Some activity	35	37	29	28	23
Low activity	23	23	29	33	46
Women					
Meets recommendations	34	28	28	27	26
Some activity	37	38	34	32	29
Low activity	28	35	38	41	45
Base					
Men	1,329	1,180	1,041	1,046	854
Women	1,313	1,285	1,310	1,397	1,274

Notes: Meets recommendations: 30 minutes or more of moderate or vigorous activity on at least 5 days a week; Some activity: 30 minutes or more of moderate or vigorous activity on 1 to 4 days a week; Low activity: lower levels of activity. Episodes of activity less than 30 minutes have been excluded. All data are self-reported.

Furthermore, this thesis was conducted in the North East of England, an area that, has fewer adults meeting the recommended levels of 30 minutes of moderate intensity physical activity five times a week, than any other region in the UK (see Table 1.2.). This highlights the specific need to target an intervention at adults with low SES living in the North East of England.

Table 1.2. Self-reported age-standardised physical activity levels among adults, by sex and strategic health authority, Health Survey for England 2008. Source: Townsend et al., 2012.

	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South East Coast	South Central	South West
	%	%	%	%	%	%	%	%	%	%
Men										
Meets recommendations	33	39	40	38	38	38	38	38	41	44
Some activity	33	30	29	35	33	31	29	35	33	30
Low activity	34	31	31	27	29	30	33	27	26	26
Women										
Meets recommendations	26	29	26	27	25	27	29	34	30	32
Some activity	32	34	34	33	32	37	31	35	32	33
Low activity	41	37	40	39	43	35	40	31	38	35
Base										
Men	429	965	714	637	676	820	755	532	527	682
Women	523	1,193	906	795	877	939	927	674	620	863

Notes: Meets recommendations: 30 minutes or more of moderate or vigorous activity on at least 5 days a week; Some activity: 30 minutes or more of moderate or vigorous activity on 1 to 4 days a week; Low activity: lower levels of activity. Episodes of activity less than 30 minutes have been excluded. All data are self-reported

More specifically, this thesis will focus on adults with low-SES, living in the North East of England, who are parents of school aged children. The motivation for this is two fold, firstly, as established above, adults with low-SES and in particular those living in the North East of England have comparatively lower levels of physical activity. Secondly there is a potential benefit to focusing on parents, if improvements can be made in their physical activity levels and their diet then there is a suggestion that this may also have a benefit to their children's diet and physical activity because of changes in family practices (Dietz & Gortmaker, 2001) a more detailed consideration of this point will be given in section 1.4.1 of this chapter.

The information presented above highlights that adults living in the North East of England with low SES are at high risk of not meeting the recommended levels of physical activity and thus a group that would particularly benefit from an intervention aimed at increasing physical activity.

1.3.2 Fruit and vegetable consumption and SES

A similar picture to that illustrated in the previous section emerges, when considering the relationship between SES and fruit and vegetable consumption. Shohaimi, Welch, Bingham, Luben, Day, Wareham and Khaw (2004) showed having a manual occupational social class, having no educational qualifications, and living in a deprived area were all independently predictive of lower consumption of fruit and vegetables. The BHF reported that in 2001 individuals in the UK with lower SES were less likely to be consuming the recommended 5 portions or more of fruit and vegetables a day than the average household (Defra/OfNS, 2010) (see Figure 1.2).
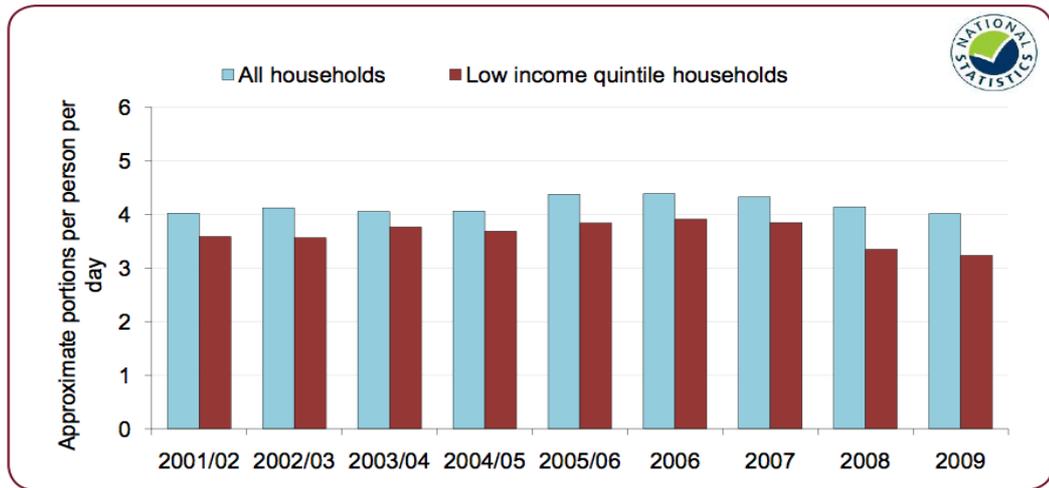
Figure 1.2 Long-term trend in fruit and vegetable purchases excluding potatoes. Source: Defra/OfNS, 2010)

As with physical activity levels, the evidence suggests individuals living in the North East of England have lower levels of fruit and vegetable consumption than those living in other regions across the UK (Defra/OfNS, 2010). The evidence further highlights individuals with low SES living in the North East are at high risk of not consuming the recommended five portions of fruit and vegetables a day (see Figure 1.3). This reiterates the point that this group should be a high priority group to be targeted by interventions, as they are at an increased risk of the negative health outcomes associated with low fruit and vegetable consumption and physical activity.
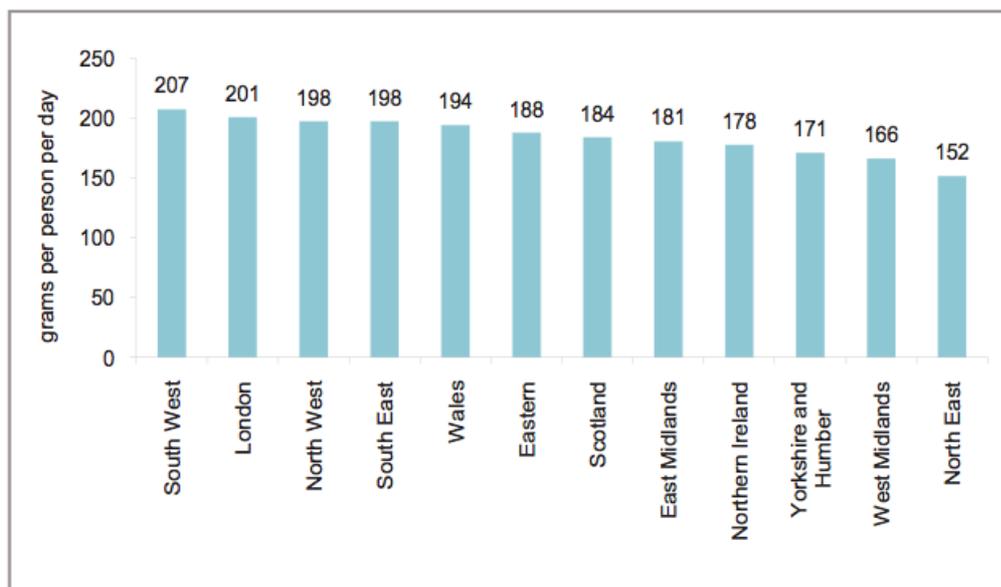
Figure 1.3 Fruit purchases by region 2008 (baseline characteristics other than region). 5 A DAY = 400 grams fruit and vegetables per day. Source: Defra/OfNS, 2010)

1.4 The target group for this intervention

The previous sections highlighted that low socio-economic individuals living in the North East of England are at high risk of not meeting recommended levels of fruit and vegetable consumption or physical activity. This thesis is unique, as it will specifically focus on parents of school-aged children, with low-SES. The motivation for this is that trends identified above for adults are also reflected for children with low SES living in the North East of England (Health Survey for England, 2009). Whilst this intervention will not be aimed at the children of the parents, nor will measures be taken of their children's behaviour, there is increasing evidence that improving lifestyle behaviours in parents is an important step in addressing the problem in children (Dietz & Gortmaker, 2001). Many interventions to tackle low levels of physical activity, poor diet and the associated childhood obesity problem are failing according to the Forsesight report (Department of Innovation, Universities and Skills, 2007). The Foresight report also identifies simply educating individuals about both the short and the long-term consequences of obesity are not enough to change behaviour. It also stressed a greater range of interventions were needed to tackle the problem. Whilst many interventions have been delivered to children through the schools system, both through changes in policy and direct interventions it may be that there is a ceiling effect in solely educating children about the importance of healthy lifestyles. Whilst it is often cited that schools provide an opportune place to intervene, as children spend a quarter of their woken lives in school, behaviours in the home may well be contradictory to those established in schools. In fact the evidence presented above suggests behaviours in the home, for the target group of this thesis, are not likely to be supportive of good practice that is now evident in many schools. A review of interventions to target childhood obesity has highlighted the importance of parents and caregivers. Interventions show greater beneficial effects when behaviour change techniques were taught to both parents and children (McLean, Griffin, Toney and Hardman, 2003). The influence of parents, concerning diet and exercise behaviours is well documented (Prout, 1996). Hesketh, Water, Green, Salmon and Williams (2005); Borra, Kelly, Shirreffs, Neville and Geiger (2003) and Young-Hyman, Herman, Scott, and Schlundt (1999) consider parental influence to be a determining factor in children's attitudes and understandings of obesity. This influence is arguably as detrimental as it can be

beneficial. Previous research (Borra, et al. 2003) argues interventions need to be developed that consider the role of the parent. Children cannot be expected to apply the information they receive at school to themselves if it is not reiterated at home. This highlights the need for interventions to be delivered into the home, where parents' behaviour can be targeted with potential benefit of improving health behaviours for the whole family. This thesis specifically targets parents' behaviour in the context of family life in part, because a positive change in parental behaviour potentially has implications for the behaviours of the whole family.

1.4.1 The participants in this study

This thesis sought to develop an intervention aimed at parents with low SES in the North East of England. A group of low SES participants were recruited through local community groups and in particular Children's Centres. These centres run groups specifically for parents with low SES in order to provide them with support in terms of skill development. Attending these sessions signifies the parents have low SES, this was corroborated in this thesis by their area of residence, using the English Indices of Deprivation (Office of the Deputy Prime Minister, 2004) and their occupation.

University students have also been shown to have low levels of fruit and vegetable consumption (Li, Concepcion, Lee, Cardinal, Ebbeck, Woekel, & Readdy, 2011) and physical activity (Haase, Steptoe, Sallis, & Wardle, 2004) and thus provide a suitable source of additional participants. Aspects of this intervention are designed to address the circumstances and understandings of the participants and this required a consideration of the views of students for some elements in the development of the intervention, this will be re-addressed in chapter 6.

1.4.2 What do we know already about barriers to healthy lifestyles for low SES groups?

The health inequalities that have been described above, demonstrate that low SES groups are at greater risk of developing so called diseases of lifestyle, previous research has demonstrated some potential reasons for this phenomenon. Wardle &

Steptoe (2003) used survey data to investigate the factors underlying differences in smoking, leisure time physical activity, and dietary choice. Participants across SES groups were asked questions about their; health behaviours, health locus of control; future salience; expectations of longevity; health consciousness and their self rated health. The findings suggested three factors were most consistently associated with SES and following a healthy lifestyle (Wardle and Steptoe, 2003). These were; a belief that health outcomes were typically a matter of chance (measured by chance health locus of control); seldom thinking about the future consequences of behaviour (measured through future salience) and influence of lifestyle on health, with lower socio-economic groups believing they had a shorter life expectancy (Wardle & Steptoe, 2003). The authors suggest the participants in this study had lower expectations about their own longevity because they have more experience of illness and disease due to lifestyle choices through observing this in their own communities (Wardle & Steptoe, 2003). Interestingly it appears this awareness doesn't prompt changes in behaviours, perhaps because of other beliefs such as the role of chance in health outcomes. Wardle and Steptoe (2003) conclude that differences in healthy lifestyles observed across demographic groups may be due themselves to variations in the individuals' experiences, opportunities, an exposure to material hardship and observing ill health in their own lives and that of others around them. These findings suggest that understanding the experience of individuals from low SES groups could help to identify strategies to change these perceptions.

Gettleman and Winkleby (2000) used focus groups with low SES women to develop a cardio-vascular disease (CVD) prevention programme. They set out to design an intervention on the basis that whilst CVD rates are higher in low-income women, health promotion and prevention are often low priorities for this group. In fact, Gettlemnn and Winkleby suggest the environments in which this group live some times promote and support behaviours conducive to CVD. The authors sought to identify health promotion strategies that would be suitable and applicable to this group. Their findings suggested these women experienced many common barriers to adopting healthier lifestyles (Gettleman and Winkleby, 2000). The feedback from the focus groups revealed the women preferred disease prevention programmes that addressed multiple risk factors for CVD whilst teaching them specific skills for adopting healthy behaviours. Gettleman & Winkleby (2000) report the women

wanted emphasis put on the importance of staying healthy for themselves, and a range of methods for effecting behaviour change. They also identified that they struggled to distinguish between health myths and health facts and clarification was needed so they had fewer misconceptions about disease outcomes (Gettleman & Wickleby, 2000). The authors also reported the participants put great importance on programmes and policies acknowledging and addressing social and financial barriers that hinder the adoption of healthier behaviours.

A further study by Andajani-Sutjahjo, Ball, Warren, Inglis and Crawford (2004) examined variations in perceived personal, social and environmental barriers to physical activity and healthy eating in terms of weight maintenance amongst young Australian women by SES and domestic situation. Using self-report survey data from 445 women aged 18-32 years they identified the most common barriers to physical activity and healthy eating were related to cost, time and motivation. In particular, and of relevance to this thesis they found women with children were more likely to report that lack of social support was a particular barrier to physical activity and that lack of social support and time were key barriers to healthy eating (Andajani-Sutjahjo et al., 2004). Interestingly the perceived barriers did not change in terms of the participants' SES or their own overweight status. However the study did not consider to what extent these perceived barriers had an actual effect on the participants own behaviour. Despite this the study importantly highlights the need for health promotion strategies to take account of perceived barriers, in particular lack of motivation, lack of time, cost and that for young women with children strategies need to specifically target lack of time and lack of social support.

These findings have gone some way to understanding the barriers, both perceived and actual, which inhibit the adoption of healthy lifestyle behaviours. They also highlight the importance of understanding the barriers low SES groups perceive in relation to specific lifestyle behaviours such as diet and physical activity when developing interventions for this group. It has also been demonstrated that interventions that seek to address health related behaviours cannot be applied confidently across populations. Albarracin, Gillette, Earl, Glasman, Durantini and Ho (2005) showed the efficacy of interventions is dependent on population specific

factors such as age, gender and ethnicity and potentially SES and therefore these factors need to be considered when developing interventions.

Michie, Jochelson, Markham and Bridle (2009) posited that by design many interventions might actually increase health inequalities because they are delivered at a population level, with such interventions being consistently less successful with individuals from low socio-economic groups.   This may not be a reflection of the intervention itself but evidence that different factors need to be considered when developing health related interventions for low SES groups, and that interventions may need to be developed specifically for these groups.   Michie et al. (2009) conducted a review of interventions to change health related behaviours such as smoking, physical activity and diet in low-income groups having identified a paucity of literature in this area.   The review sought to identify the behaviour change technique employed, the theoretical basis for the intervention and the efficacy of the intervention.   Of the studies included, nine had a positive effect on behaviour with seven demonstrating no change in behaviour and one reporting an adverse effect on behaviour (Michie et al., 2009).   Michie et al. (2009) found that only six of the studies included relevant theory to develop the intervention however there was generally little information given about the operationalisation of the theory in the interventions, both in terms of content and effect.   Michie et al. (2009) concluded that where interventions were effective with low SES groups they tended to use fewer intervention techniques.   However the key finding was that there was a clear lack of evidence available to inform the design of interventions aimed at changing health related behaviours in low-SES groups. This thesis sought to address this issue by working with low SES groups to develop aspects of the intervention.   The intervention techniques and the theory supporting it that was used in this thesis will be presented and discussed in the following chapter (chapter 2).   The remainder of this chapter will consider the literature concerning interventions delivered via the Internet, the mode of delivery for the intervention developed in this thesis.

1.5 Intervening online

In order to deliver an intervention this thesis used the Internet.   The following sections discuss the appropriateness of the Internet as a means to deliver a health

intervention and also consider the appropriateness of this mode of delivery for the target population. There has been a growth in recent years in interest in the Internet as a tool for health-related information and communication. There is now a wide range of medical information and services available through the Internet; in addition increasingly many sites now focus on healthy lifestyle issues. The purpose of these sites is to provide a wide range of information on a variety of health topics, many of these sites offer additional services beyond the presentation of health information such as; 'Ask an Expert' services, tests, discussion boards (Korp, 2006) and increasingly the inclusion of motivational techniques aimed at improving lifestyle behaviours (Evers, 2006). Wantland, Portillo, Holzemer, Slaughter and McGhee (2004), demonstrate web-based and computer delivered health interventions can significantly improve participants' knowledge, attitudes and even behaviours. As Evers (2006) points out however, to be effective in a real world setting online interventions need to concentrate on initiating and motivating behavioural change as opposed to the presentation of simple health related information, this is a central notion of this thesis.

1.6 Online health promotion

The growth of e-health has received mainly positive feedback with many commentators focusing on the potential that information technology has for improving health care and health promotion (Bernhardt and Hubley, 2001; Eysenbach and JaFather, 2001). Bernhardt and Hubley (2001, p.643) go as far calling the expanse a 'revolution', with others viewing it as a paradigm shift (Kahn, 1997; Chin, 2000). Others however have been more cautious raising concerns about the quality of information available on the Internet, something which researchers have warned needs to be addressed (Eysenbach, Diepgen, Lampe & Brickley, 2000; Risk & Dzenowagis, 2001; Eysenbach, 2002). Despite these concerns, which in reality may be hard to address when considering the sheer amount of information online, the main consensus appears to be the Internet provides a valuable tool for both health care and health promotion (Korp, 2006).

In a systematic qualitative review, Griffiths, Lindenmeyer, Powell, Lowe and Thorgood (2006) looked at the motivations for health interventions to be delivered

online, by identifying the reasons provided in papers for doing so. A total of 37 interventions were included in the review including 9 pilot studies, the interventions encompassed a variety of health conditions including; health promotion issues such as obesity, physical activity, smoking cessation; caregiver support; specific health conditions including cancer, eating disorders and diabetes, whilst some offered cognitive behavioural therapy (CBT) delivery (Griffiths et al., 2006). Several studies included in the review highlighted specific advantages of Internet technology, such as; the ability to reach large numbers of people at once; the ability to store large amounts of information that can be easily updated; the opportunity to provide personalised feedback and the possibilities of video transmission (Griffiths et al., 2006). Griffiths et al. (2006) report six key reasons for Internet delivery of interventions; reducing cost and increasing convenience for users; reducing health service costs; reducing user isolation; the ability to deliver timely information; reduction of stigma and the potential for increased control of the intervention for both the user and the supplier. These motivations are central to the premise for the use of the Internet to deliver a health promotion intervention in this thesis. Stigmatisation is a potential consequence of poor diet and low levels of physical activity particularly when overweight and obesity are the outcome of those behaviours. Overweight and obese individuals often feel stigmatised and subsequently become isolated (Puhl & Brownwell, 2001). In addition given the direct and indirect costs of poor lifestyle choices that were highlighted earlier in this chapter, low cost, high impact interventions must be considered the most attractive to policy makers and stakeholders. It also provides the opportunity for people to access the intervention in their own time regardless of the constraints of their day-to-day lives. Factors such as Internet access and computer literacy need to be taken into account. These are particularly important to this thesis as the target population this research aims to intervene with are parents with low SES and their access to the Internet may be less than those with higher economic status. This will be considered in more detail later in this chapter.

1.6.1 Are online interventions successful?

Research has focused on the feasibility of online health interventions and their potential advantages (Ritterband & Thorndike, 2006). The past few years have seen

a rise in the empirical evidence supporting their effectiveness of a range of health related behaviours and health conditions (Wantland et al., 2004; Griffiths et al., 2006; Strecher, 2007). Specific areas that such interventions have been shown to be effective include; chronic pain (see Brattberg, 2007); diabetes self management (see Kim & Jeong, 2007); smoking cessation (see Graham, Cobb, Raymond, Sill & Young, 2007); problem drinking (see Walters, Vader, & Harris, 2007); weight-loss (see Hunter, Peterson, Alvarez, Poston, Brundige, Haddock, van Brunt & Foreyt, 2008) and, amongst many others, dietary change and physical activity (see Cook, Billings, Hersch, Back & Hendrickson, 2007; Hurling, Catt, De Boni, Fairley, Hurst, Murray, Richardson & Singh Sodhi, 2007).

Over the last decade several meta-analyses have assessed the extent to which Internet health interventions have been successful. The Cochrane review (Murray, Burns, See Tai, Lai & Nazareth, 2005) included 24 randomised controlled trials (RCTs) developed specifically for patients with chronic disease. This review acknowledged the difficulty in drawing comparisons across the wide range of interventions included. The variable nature of Internet health interventions, the limited range of populations included in the trial, the different conditions studied and the variation in the intensity of exposure to the interventions, limited conclusions concerning their effectiveness (Murray et al., 2005). Despite this, the review found support for positive changes across knowledge, social support, health behaviours, clinical improvements and self-efficacy. The review highlights specific aspects in the way Internet health interventions facilitate these changes. Murray et al. (2005) identified that changes in knowledge were probably the result of the interactive nature of online information. They point to evidence that suggests computer assisted learning can be a more effective means of learning than traditional teaching methods (Fletcher Flinn, 1995) as support for this (Murray et al., 2005). Positive changes in health behaviours were demonstrated by the meta-analysis of continuous data, this was supported by the positive effect in the meta-analysis of the binary data (Murray et al., 2005). They also attribute the lack of significance in the binary data to the small number of studies that were combined in analysis (Murray et al., 2005). Murray et al.'s (2005) findings are congruent with other reviews in this area, with a narrative review by Nguyen, Carrieri-Kohlman, Rankin, Slaughter & Stulbarg (2004) concluding that

professionally facilitated, internet-based, patient education and support interventions could, in some cases, improve health outcomes.

Wantland et al. (2004) conducted a meta-analysis to compare the effectiveness of web-based versus non web-based behaviour change interventions. The authors concluded that web-based interventions lead to better outcomes than the non-web-based interventions for the specified knowledge or behaviour change outcome measure (Wantland et al., 2004). They report that sixteen of the seventeen studies in the meta-analysis, that measured outcomes as an effect on participants' knowledge or behaviour, reported improved outcomes for the web-based interventions. It is important to point out that whilst these reviews suggest positive outcomes for online health interventions all the reviews have highlighted the variability in both study outcomes, outcome measures, populations, study design and health focus and thus some caution is advised when considering the findings. This is still a relatively young field of research and therefore all findings need to be treated with caution and there are issues with many studies such as relatively small samples sizes, often due to poor attrition rates and some have only reported change in secondary measures such as intentions and self-efficacy as opposed to primary outcomes such as actual measurable behaviour change.

Further to this, Kennedy, Powell, Payne, Ainsworth, Boyd and Buchan (2012) highlight that whilst information technology can help individuals to change their behavior, the potential of this field is currently under-developed. They argue that to date, most research has treated information technology and the internet, as passive mediums and the full potential of these technologies to play an active role in the behavior change process needs to be explored.

1.7 Theoretical underpinnings in online health interventions

One criticism that has been offered against online health interventions is the lack of theoretical underpinnings aiding their development (Ritterband & Tate, 2009). More recent meta-analyses have attempted to consider the theoretical basis for the intervention or the behaviour change technique employed. Portnoy, Scott-Sheldon, Johnson and Carey (2008) went someway to addressing this issue in their meta-

analysis of studies that used computers to promote health behaviours. Seventy-five RCTs were identified which incorporated 82 separate interventions and were coded for study and participant characteristics, design, methodology and intervention content (Portnoy et al., 2008). The study focused on theoretically meaningful psychosocial and behavioural outcomes; knowledge, attitudes, intentions, social norms, self-efficacy, and both reported behaviour or objective measures of behaviour. Portnoy et al. (2008) also conducted moderator analyses to determine the effect sizes for the relationship between study characteristics and heterogeneous outcomes. Although this study had intended to look at the effectiveness of interventions within specific domains too few studies reported psychosocial outcomes for this to be viable (Portnoy et al., 2008). The paper reports the effect on computer delivered health interventions on psychosocial outcomes across health domains. Finding that compared to controls, participants receiving a computer delivered intervention improved psychosocial outcomes of health knowledge, attitudes and behavioural intentions but not self-efficacy or social norms (Portnoy et al., 2008). The computer delivered interventions also successfully improved health behaviour in several domains including, nutrition, substance use, tobacco use, safer sexual behaviour, binge/purge behaviours and general health maintenance but not for physical activity, weight loss, diabetes control, or weight gain/maintenance (Portnoy, 2008). Portnoy et al. (2008) point out sample, study and design characteristics moderated both the psychosocial and behavioural findings and that these may identify strategies that are more or less effective across different domains, populations or designs. In conclusion Portnoy et al. (2008) report computer-delivered interventions can lead to improved behavioural outcomes.

Webb, Joseph, Yardley and Michie (2010) addressed the issue of identifying the extent to which theory was utilised in online behaviour changed interventions to promote health. This systematic review and meta-analysis focused on the impact of theory, the use of behaviour techniques as well as the mode of delivery on efficacy in Internet based health interventions. The authors were able to build on previous reviews such as those discussed above, due to the recent development of Abraham and Michie's (2008) taxonomy of behaviour change techniques for behaviour change and Michie and Prestwich's (2010) theory coding scheme. Eighty-five studies were included in the Webb et al. (2010) review, and were selected on the basis that the key

components of the intervention were delivered online, via the Internet, the participants were randomly assigned to conditions and a measure of health related behaviour was taken following the intervention. The findings reported in this review support the notion that the Internet can be an effective means of delivering health related interventions. Webb et al. (2010) report that typically interventions had a small but statistically significant positive effect on health related behaviour. The effect of these interventions may be statistically small, but as Webb et al. (2010) point out, statistical effectiveness is not the same as effectiveness in terms of public health outcomes. A small effect in an online trial may have the benefit to assist large numbers of people at a population level (Webb et al., 2010). This is an important point to make especially when considering intervention cost, with the majority of cost of Internet interventions coming from design and development rather than the actual delivery of the intervention (Webb et al., 2010). Webb et al. (2010) also calculated effect sizes for the behaviours most commonly targeted by Internet interventions finding that slightly larger effects for interventions targeting single behaviours such as physical activity and dietary behaviour (Webb et al., 2010). Slightly smaller effects were found for smoking cessation and effects were smaller still if multiple behaviours were targeted (Webb et al., 2010).

The extent to which theory was used in the studies included in Webb et al's (2010) review was assed using the theory-coding scheme developed by Michie and Prestwich (2010). In the majority of cases theory was used to either select or develop an intervention technique. Theory was mentioned in over 20% of the interventions, in some cases theory was linked to intervention technique and some interventions linked at least one construct, which was theory relevant, to an intervention technique. When theory was used to select participants the largest effects were observed, with smaller effects resulting from most other uses of theory (Webb et al., 2010). Meta-regression demonstrated that that effect sizes were positively impacted by the increased use of theory. Larger effects observed in interventions making greater use of theory and small effects in those that made less extensive use of it (Webb et al., 2010). The theories used to inform the interventions also varied greatly with only three theories used to inform three or more interventions; the transtheoretical model (Prochaska & DiClemente, 1984); social cognitive theory (Bandura, 1989) and the theory of reasoned action/planned

behaviour (Fishbein & Ajzen, 1975; Ajzen, 1991). Out of these three theories the interventions based on theory of planned behaviour were linked with the larger effects on behaviour. Interventions based on the transtheoretical model tended to have smaller effects, but the smallest effects were observed in interventions based on social cognitive theory (Webb et al., 2010). Whilst these are promising findings and support the extended use of theory in online interventions it is important not to interpret this as direct support for the effectiveness of particular theories at promoting changes in behaviour. Given the limited range of theories used in the studies reported in Webb et al. (2010) conclusions can not be drawn as to which theories are most effective in online health interventions. There needs to be a wider application of behaviour change theories or, theoretically based behaviour change techniques, in online interventions in order to better understand the most effective applications of theory in online behaviour change interventions. In particular studies need to better document how and what theory or theories are applied to an intervention so that future reviews can present a more comprehensive evaluation of the role of theory in online health behaviour change interventions. This thesis will provide a theoretical basis for the inclusion of self-affirmation as a viable technique to promote behaviour change. The literature supporting this is considered in chapter 2.

Webb et al. (2010) also looked at the different techniques that were used across the interventions by using Abraham and Michie's (2008) taxonomy. Webb et al. (2010) reported that the most commonly used behaviour change techniques were, *providing information on the consequences of behaviour in general, prompting self-monitoring of behaviour* and *identifying barriers or problem solving,* although these techniques were not associated with particularly large effect sizes. *Barrier identification or problem solving* was associated with the largest effect size of these three although the not the largest overall. *Prompting self-monitoring of behaviour* was also not associated with a large effect however it is important to point out that in many cases intervention studies by their very nature prompt self-monitoring of behaviour in order to measure the effect of the technique on behviour. *Providing information on the consequences of behaviour in general* had an even smaller effect The weak link, between simply knowing about something and subsequent changes in behaviour, has been well established (Harris, Sillence & Briggs, 2011) so this is unsurprising. This

thesis is unique as it uses a behaviour change technique that increases the acceptance of health related information. Chapter 2 considers this in more detail, and offers explanations as to why information may not be accepted by the target audience. The techniques that were shown to have the largest effect in Webb et al.'s (2010) review were, providing stress management training and general communication skills training. It is important to point out however that these types of techniques were used in a very small number of studies and thus these results should be interpreted with caution. Furthermore they are techniques that are more suited to long-term interventions. In this thesis an intervention will be developed that doesn't require a long-term commitment from participants, as it works by increasing the acceptance of information in the first instance so that more intensive intervention is not required.

Webb et al. (2010) demonstrate there is good empirical evidence supporting the use of the Internet to deliver health intervention. Their review highlights the need for interventions to make better use of theory in their development and to be more stringent in their documenting of how they do this. This will mean that more accurate assessments can be made of the efficacy of online health interventions. They do urge the reader to take their findings with caution, due to the small number of interventions associated with some of the larger effect sizes.

Bennet and Glasgow (2009, p. 277), highlight reviews such as discussed above 'may have inherent flaws'. Asking if the Internet functions as a platform to deliver interventions is problematic. Eysenbach & Kummervold (2005) argue meta-analyses of such interventions may belittle how important specific intervention designs and components areas. All of the reviews included here note the wide variability that exists across study designs. Unmasking this heterogeneity may allow better understanding of how to improve intervention efficacy (Bennet and Glasgow, 2009). Bennet and Glasgow (2009) suggest that future reviews and meta-analyses should focus on interventions targeting the same behavioural outcomes.

1.8 Internet interventions targeting dietary change and physical activity

Online interventions have been developed to promote dietary change and physical activity, the behaviours targeted in this thesis. Here a more detailed consideration is

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given to Internet based interventions that promote physical activity and dietary change.

1.8.1 Physical activity

Van den Berg, Schoones and Vliet Vlieland. (2007) conducted a qualitative systematic review of RCTs of Internet-based physical activity interventions. Six of the ten studies included in the review used theoretical models to design aspects of the intervention including the transtheoretical model, social cognitive theory, the theory of planned behaviour, protection motivation theory (Rogers, 1975) and a social-ecological model. Van den Berg et al. (2007) were unable to conclude if the application of a theoretical model improved the effectiveness of an intervention although pointing out, some studies support this notion (Mihalko, Wickley & Sharpe, 2006; Kirk, Mutrie, Macintyre & Fisher, 2004; Woods, Mutrie & Scott, 2002). Van de Berg at al., (2007) report that Internet interventions to promote physical activity were more effective in comparison to a waiting list strategy (the control group in 4 of the reviewed studies). The authors reiterate the potential advantages of Internet interventions such as those described by Griffiths et al. (2006) and highlight that more research evidence is required to draw clearer conclusions.

In a review of Internet interventions that were aimed at both physical activity or dietary change or both (Norman, Zabinski, Adams, Rosenberg, Yaroch & Atienza, 2007), the authors reviewed 13 studies aimed at promoting physical activity. As with the studies included in previous reviews the majority of studies here, 11 of the 13, were based on either the transtheoretical model or social cognitive theory, with the other two not stating a theoretical basis. The extent to which a theoretical basis increased the effectiveness of an intervention could not be determined. Overall this review found some support for the effectiveness of Internet base interventions that promote physical activity, although further research is needed to strengthen this support (Norman et al, 2007).

More recently, Davies, Spence, Vandelanotte, Caperchione and Mummery (2012) conducted a meta-analysis of internet delivered interventions to increase physical activity levels. The analysis revealed across the 34 articles identified for inclusion,

internet delivered interventions, had a small, but significant positive effect on physical activity levels. Whilst the authors urge caution given the small effect size (Davies et al., 2012) and the uncertainty about the long-term effects of such interventions such findings do support the potential for internet delivered interventions.

1.8.2 Dietary Change

Dietary change has been the focus of many online health interventions, targeting a variety of dietary behaviours such as fruit and vegetable, fibre or dietary fat consumption. Of particular relevance to this thesis are those targeting fruit and vegetable consumption.

Neville, O'Hara and Milat (2009) systematically reviewed computer-tailored interventions to promote dietary change. This review included nine papers, comprising twelve interventions over thirteen studies. In this review, once again the most common theories used to guide the design of the intervention were the theory of planned behaviour and social cognitive theory (Neville et al., 2009). Seven studies included in the review specifically targeted fruit and vegetable consumption with four finding positive effects on behaviour when comparing a computer tailored intervention to a control group (Neville et al., 2009) and a further study (Oenema, Tan & Brug, 2005) found effects on mediator variables such as awareness and intent but not on actual fruit and vegetable consumption (Neville et al., 2009). Neville et al. (2009) concluded that in most cases, studies had isolated the effects of the technology and the tailoring in the intervention design, and that this was linked to significant positive outcomes. They also highlighted several factors that to some extent determine the efficacy of an intervention including the quality of the intervention; its duration, the intensity of and the exposure to the intervention, the use of theory, the method of tailoring, the mode of delivery and the use of theory (Neville et al., 2009). In particular Neville et al. (2009) highlight the use of tailoring and the application of theory seem to be particularly important factors in the success of an Internet intervention to change dietary behaviour.

Norman et al. (2007) also reported on the efficacy of interventions targeting dietary change, in this case sixteen publications used interventions to target dietary behaviour covering 14 different studies. As with previous reviews the transtheoretical model and social cognitive theory were the most common theoretical basis for the interventions (Norman et al, 2007). In this case seven of the studies demonstrated a positive effect on dietary behaviour, most commonly fruit and vegetable consumption or dietary fat reduction (Norman et al., 2007). In the other studies the effects were indeterminable (Norman et al., 2007). Once again, variability in the types of studies included, prevent strong conclusions being drawn however the results suggest that online interventions can lead to changes in dietary behaviour.

Hamel & Robbins (in press) systematically reviewed the efficacy of web-based interventions to promote healthy eating in children and young people. They concluded that the majority of interventions resulted in significant positive changes in eating behavior (Hamel & Robbins, in press). They did note however, that the long-term impacts on eating behavior of such interventions was still to be ascertained, with many studies that included longer term follow up demonstrating that changes were not maintained. Hamel & Robbins (in press) suggest that greater tailoring of such interventions may help to maintain their success in the longer term.

Alexander, McClure, Calvi, Divine, Stopponi, Rolnick, Heimendinger, Tolsma, Resnicow, Campbell, Strecher, & Johnson (2010) measured changes in fruit and vegetable consumption by comparing an online untailored program, with a tailored behavioural intervention and with a tailored behavioural intervention plus motivational interviewing–based counseling via e-mail. Alexander et al. (2010) assessed mean change in fruit and vegetable servings per day at 12 months after baseline, through a validated, self-report, food-frequency questionnaire. On average, fruit and vegetable consumption increased by more than two servings per day. The greatest increase in consumption was observed in the condition with the tailored behavioural intervention plus motivational interviewing.

The development of the website used in Alexander et al.'s (2010) Intervention provides some interesting and useful information of relevance to this thesis. In this

study, components of several models of behaviour change including social cognitive theory, the transtheoretical model and the health belief model (Becker, 1974) were used to develop the website contents. Constructs from these models were used to aid tailoring, including; motivation to change such as, health improvement, weight loss, role modeling; barriers to changing including the expense of produce, inadequate cooking skills, disliking the taste and cues to action for example participants were advised to keep produce in sight and the programme provided recipes (Alexander et al., 2010). Readiness to change data was used to ensure that the randomised groups were matched in terms of their current behaviours. Alexander et al. (2010) reported the websites across the three conditions had a similar content and design across all groups and focus groups were used to inform the design of the website including aspects of navigation and the type of practical advice that was given. In terms of tailoring the website's content was matched to the participants' needs, dietary preferences and their interests (Alexander et al., 2010). Working with participants to develop both website and health message content is something that this thesis will focus on doing and helps to ensure that tailoring, whether it be at an individual or group level, is effective. This study also raises interesting questions about the importance of website design, in particular the visual appeal and credibility of the site. This is an aspect that many other articles have neglected to raise and discuss, and will be addressed in this thesis.

1.8.3 Physical activity and dietary change

Given the importance of both diet and physical activity both in relation to obesity and a range of other associated health conditions, it is unsurprising that interventions have aimed to tackle both behaviours. Norman et al., (2007) found 20 studies that aimed to address physical activity and dietary behaviour suitable for inclusion in their review. All of the studies included some component of physical activity and dietary change using websites, computers, kiosks or e-mail. Ten of the studies used a theoretical backdrop to their development with the majority citing the transtheoretical model often in combination with social cognitive theory or the theory of planned behaviour (Norman et al., 2007). Seventeen studies provided outcome measures of physical activity with seven demonstrating positive effects of the e-health intervention; seventeen also provided measures of dietary behaviour

with six showing positive effects (Norman et al., 2007). Norman et al. (2007) reported eleven studies measuring weight-loss as an outcome measure with four showing positive effects and two showing that Internet interventions were less successful than an in-person therapist (Norman et al., 2007). Norman et al. (2007) speculate that interventions targeting multiple behaviours are likely to have more content and be more time consuming than interventions targeting single behaviours. It is suggested that individuals targeted by the interventions may not feel that they have the time to engage with all of the intervention components for multiple behaviours (Norman et al., 2007).   Whilst this represents a challenge for e-health interventions it is important to note than many of these lifestyle behaviours are interlinked and that holistic approaches could lead to wider benefits. Norman et al. (2007) suggest research needs to look at different combinations of behaviour targets and consider where simultaneous or sequential interventions are the most effective. One important aspect that all these reviews have highlighted across the behaviours is the notion of tailoring message or website content to individuals or specific groups; this is considered in more detail below.

1.9 Tailoring messages

It is common practice, in any type of behaviour change intervention, whether they are on or off-line, that participants are given information that should facilitate or prompt a change in behaviour. However, offline evidence suggests that the knowledge-behaviour link is weak (Harris et al., 2011) particularly when information provided is generalised across populations. Advice that may be suitable for one individual or a group of individuals may not be for others, in fact it some circumstances it can actually compound barriers that people face (Hesketh, et al., 2005). For example if somebody with a limited available income reads the advice "join the gym to get fit" they may be more inclined to believe that getting fit is out of their grasp as joining the gym is not an economically viable action for them to take. By better understanding the circumstances of the target individual or population better interventions can be developed (Hesketh et al., 2005).   Researchers also suggest that by improving forms of communication to make them more personal and considering the particular circumstances of individual communities can help to address inequalities that exist around the acceptance of health messages (Nutbeam,

2000). Strecher (2007) noted that the Internet essentially provides shelves of digital pamphlets, simply presenting information online where it has previously been presented in leaflets. It is an essential premise of this thesis that the information people receive needs to be appropriate to them.

In the case of this thesis the intervention being designed is aimed at specific groups and therefore some aspects of the health message will be tailored based on information gathered from those groups, in particular information about barriers the experience to adopting healthy lifestyles. Tailoring, whether it is at a personal level, or at group level, such as SES or location has been shown to increase the effectiveness of an intervention (Bennett and Glasgow, 2009).

1.10 The digital divide

Whilst much research has focussed on the Internet as a potential means of delivering health related interventions there is an important consideration to make. It has been established earlier in this chapter that the target group for the intervention developed here is parents with low SES. However, there is an argument that low SES groups may be affected by a phenomenon known as the digital divide. This as Korp (2006) explains, exists because well-educated and well-off individuals have better access to the Internet to a much greater extent than less well-educated and less well-off individuals. Loader (1998) suggests that this is because groups who are better educated have online access to a far greater extent than to those who are less well educated. Korp (2006) highlight the particular relevance of this phenomenon to the e-health field. Andreassen, Sandaune, Gammon, Hjortdahl, (2002) suggest that level of educational attainment is a determining factor in people's use of the Internet for health purposes. This is further reiterated by the work of Kalichman, Benotsch, Weinhardt, Austin, Luke and Cherry (2003) who identified that, groups with higher income tended to use the internet for health purposes more than groups with lower incomes.

Whilst this may be the case it is important to note that Internet access and Internet use has continued to increase over the decade and recent government statistics (OfNS, 2011) demonstrate that in 2011, 77% of UK households had Internet access

an increase from 73% in 2010 (OfNS, 2010). What is more, parents of school aged children are likely to fall into age group categories between 16-54, and according to the Office for National Statistics (OfNS, 2012) around 90% of people in this age group have used the Internet (see Figure 1.4) with about 80% accessing everyday or almost everyday (OfNS, 2010).

Per cent of adults
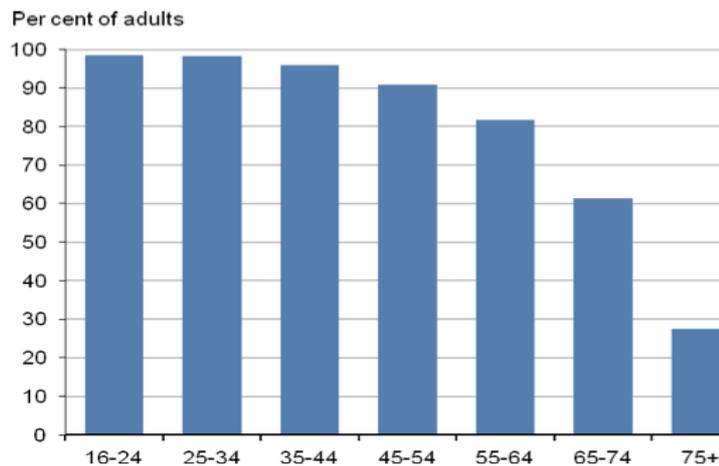
Figure 1.4 Internet use by age group 2012 (OfNS, 2012)

It is important however to point out that currently, Internet use is lower amongst people with a lower income, although over 90% of individuals in the lowest income bracket have used the Internet (OfNS, 2012). Internet use is also lower amongst those living in the North East of England, the setting for this intervention (see figures 1.5 & 1.6) but it is increasing year on year. There are a large proportion of individuals living in the North East with low SES that do regularly access the Internet. It is also noteworthy that increasingly Internet access is gained through public hotspots and mobile devices (OfNS, 2012) all of which suggests that Internet access is only going to increase amongst socially disadvantaged groups, as it is more widely available at a lower cost.
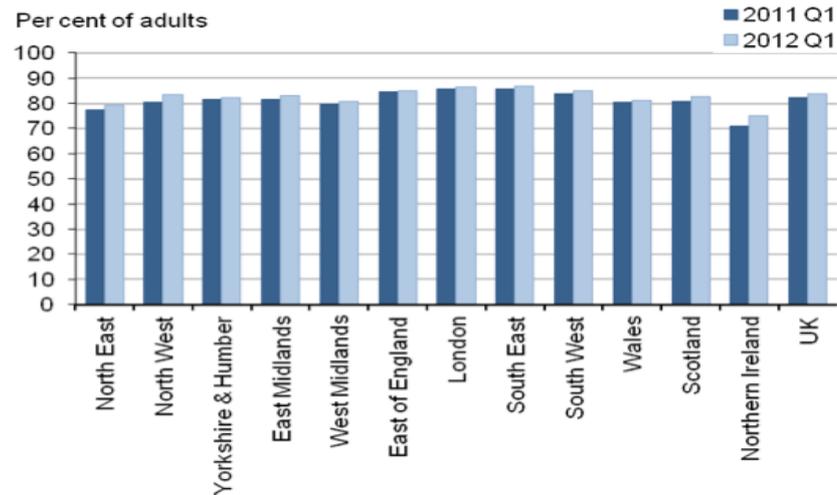
Figure 1.5 Internet users by region (OfNS, 2012)
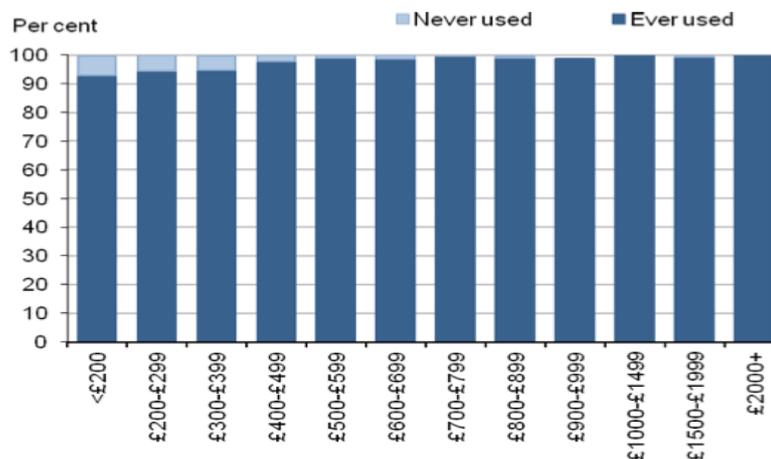
Figure 1.6 Internet use by weekly income (OfNS, 2012)

It is also important that when developing health related interventions researchers consider that different groups of Internet users may have different needs (Korp, 2006). This further promotes the need for ensuring that messages and interventions are developed to incorporate the specific needs of different groups to encourage such groups to engage with e-health initiatives.

1.11 Trust in and credibility of, online health information

The use of the Internet to deliver health interventions also raises other important questions. When information about a particular health condition is presented on a website or via other forms of media, considerations also need to be made about the impact the website itself has on the trust individuals have in the information that is

presented. There has been much debate on the quality and credibility of the information that is presented online (Eysenbach, Diepgen, Lampe & Brickley, 2000; Eysenbach, 2002). For this reason, this thesis, will use a health message that has been previously used in an offline self affirmation intervention (see chapter 2, section 2.5) and is based on government recommendations. Whilst, for the reasons described above, some aspects of this message will be tailored to the target population, considerations will also be made about what constitutes trustworthy and credible information for the target audience. The development of recent models provides insight into the key components relating to the credibility of websites.

1.11.1 Three-dimensional human model

Cugelman, Thelwall and Dawes (2009) describe social marketing as an approach to social and individual behavioural change. Social marketers, as described by Kotler and Roberto (1989), differ from commercial marketers as they attempt to encourage individuals to change unhealthy lifestyles for healthy ones, as opposed encouraging consumers to exchange money for products or services. Andraesen (2002) argues that for social marketers the bottom-line in their campaigns is behavioural impact rather than attitude change or public awareness which other health campaigns may target. Cugelman et al., (2009) posit that the Internet is becoming a particularly important medium to deliver social marketing campaigns, which generally target public health, environment protection, safety and social development issues (Kotler, Roberto & Lee, 2002). This approach has clear implications for health related interventions as it attempts to build on the criticisms that websites need to move beyond the simple presentation of health information and target behaviour change (Evers, 2006). Cugelman et al. (2009) suggest that one aspect that may be weakening the impact of web-based interventions is the perceived credibility and trust associated with such sites.
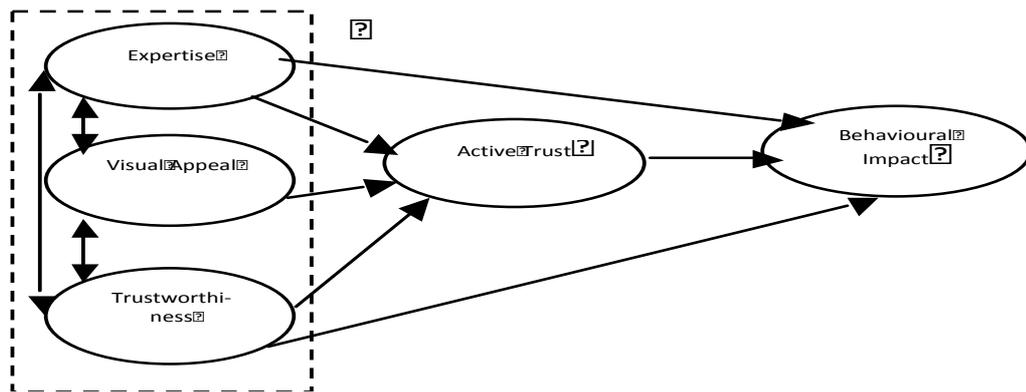
Figure 1.7 Three-dimensional human model (Cugelman et al., 2009)

Cugelman et al. (2009) propose a three-dimensional human model to assess *website-credibility* (see Figure 1.7)*,* a development of a more traditional two-dimensional model for computer credibility (Fogg & Tseng, 1999). Fogg & Tseng (1999) proposed that the key components of *website credibility* are user perceived *expertise* and *trustworthiness* and that users make an assessment of these when considering the credibility of computer mediated information. They propose that it is only when credibility is deemed to be high that users will trust the information and then potentially act on it (Fogg & Tseng, 1999). The three dimensional model is posited on the basis of Ohanian's (1990) celebrity endorser credibility model. Ohanian (1990) highlighted marketing campaigns that employ a celebrity endorser are more successful because of the *attractiveness* associated with that celebrity endorser.

Cugelman et al. (2009) suggest that a similar process occurs when individuals make a judgement about the credibility of a website equating *attractiveness* to *visual appeal.* It is proposed, in the three-dimensional model, that *visual appeal* is a component of overall *website credibility.* It is important to note that Fogg and Tseng (1999) don't ignore the role of visual appeal but they see it as a factor that impacts judgements of *expertise* and *trustworthiness* rather than a core component of *website credibility.* Cugelman et al., (2009) used structural equation modelling to demonstrate the three-dimensional human model is more appropriate to assess user engagement with web-based campaigns than the two-dimensional computer model. According to this model *website credibility* is seen to represent a psychological judgement about the believability of a website's content based on the user's perceptions of the site's *trustworthiness* and *expertise* and the site's *visual appeal* (Cugelman et al., 2009). The user's judgement of the website's credibility

determines whether they develop *active trust,* which is defined as the user's confidence in acting on the advice of the website. The model then suggests there is an association between *active trust* and *behavioural impact* meaning the user acts on the website advice (Cugelman et al., 2009). The structural equation modelling also revealed that there is a direct association between *visual appeal* and *trustworthiness*, but not *expertise* and *behavioural impact,* suggesting that these factors are independently associated with *behavioural impact* and not always mediated by *active trust*. Cugelman et al. (2009) suggest that when developing an online intervention, target audiences should be the judges of what constitutes a credible and trustworthy website, and that they should be involved in the design process to understand what the target audience finds visually appealing. They propose that campaigns may also need to incorporate a motivational element to bolster their effectiveness (Cugelman et al., 2009). In fact they go as far to say that *website credibility* and *active trust* will only have a positive effect on behaviour if they are associated by a motivating component in the intervention (Cugelman et al., 2009). Furthermore they reiterate the importance that the intervention highlights the expertise and trustworthiness of the information, whilst not ignoring the importance of ensuring the website is visually appealing (Cugelman et al., 2009). Cugelman et al. (2009, p. 467) conclude 'that website credibility is a key component of online behavioural change interventions'.

1.11.2 A predictive model of trust in Internet-based health information and advice
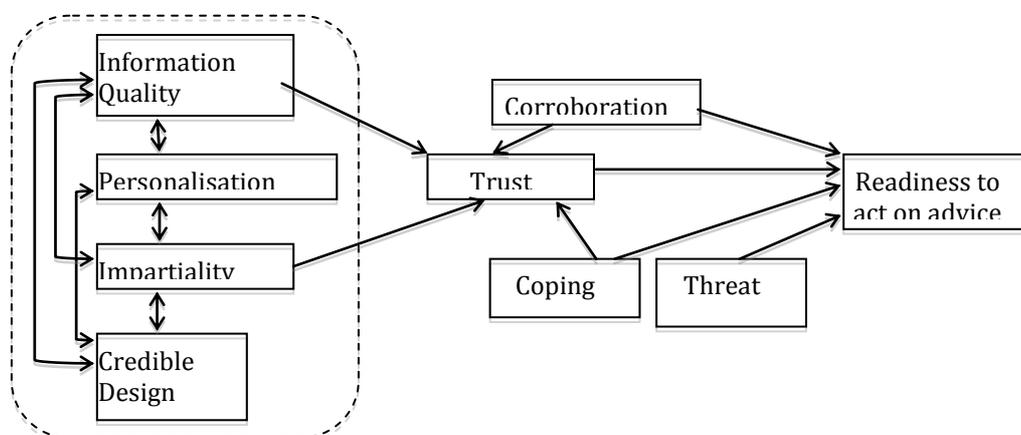
Figure 1.8 Model of trust in relation to health advice websites (Harris, Sillence & Briggs, 2011)

More recently, researchers have proposed a model of trust in Internet-based information and advice (Harris et al., 2011). This model (see Figure 1.8) is primarily concerned with trust in online health information rather than specific health related online behaviour change campaigns. However it, like that of Cugelman et al. (2009), is useful to consider when developing an intervention that involves delivering health information online. This model has many similarities with that of Cugelman et al. (2009) and includes comparable variables along with additional variables that reflect its sole focus on health related information, making it highly relevant to this thesis.

In this model the components *quality of information, impartiality* and *credible design* can be likened to *expertise, trustworthiness* and *visual appeal* and are seen to determine website credibility and contribute to *trust* in the information (Harris, et al., 2011). This model also suggests that *personalisation,* which refers to the personal relevance and tailoring of the information to the user, is also an important factor that contributes directly to the user's trust in the information. This highlights once again the importance of understanding the target audience and making sure the information is appropriate to them. There are other additional components in this model that don't appear in the Cugelman et al. (2009); *corroboration, threat* and *coping.* It is important when considering these additional components in relation to this thesis, that these have been developed in the context of actively searching for websites containing online health information. In the case of this thesis, an intervention is being delivered to participants via a website and they will be directed to, rather then landing on it as a result of an Internet search. These factors are unlikely hold the same importance in this instance as they do when individuals are actively searching out information on a particular health condition that presumably they have already identified has a personal relevance to them. They will still need to be considered, as for example, whilst the participants may not have chosen to search for the information themselves it may still prove to be important that it corroborates any existing knowledge that they already have. It may also be that the information presented in the intervention alerts them to a *threat* and this will contribute to the individuals' *readiness to act on the advice.* Further consideration is given to people's reaction to threatening information in the following chapter as being alerted to a threat, particularly one that identifies an individual as being at-risk can result in a rejection of the threatening information.

1.12 Thesis overview

This thesis describes the development and testing of an online intervention with the overall aim of increasing fruit and vegetable consumption. The primary target of the intervention is parents with low SES and the intervention is also tested with a sample of students. Chapter 1 presents why, the primary target group should be a key target of health related interventions and considers why the Internet is a viable mode of delivering such interventions. It also highlights that additional considerations need to be made with regards to website credibility when presenting health related information online. Chapter 2 presents literature concerning the acceptance of health messages and proposes self-affirmation as a technique suitable for use in an online intervention. Chapter 3 describes a qualitative study to explore the target group's day-to-day lives, their understandings about diet and physical activity, and barriers they perceive to following healthy lifestyle practices. This chapter also consider the current role of technology in the target population's lifestyles. Chapter 4 describes a Q-sort study to identify the extent to which these barriers are unique to parents with low SES, and further explores the role of these barriers, and the participants' circumstances in their health related lifestyle behaviours. Chapter 5 describes a pilot study to assess if self-affirmation as a viable technique to use in an online setting, as to date it has previously been used exclusively in an offline setting. It also trials the effect of self-affirmation on physical activity levels and a combination of physical activity and fruit and vegetable consumption, as well as fruit and vegetable consumption alone where its effects have been previously demonstrated offline. Chapter 6 assesses what is viewed as a credible health related website in order to inform the design of that aspect of the intervention. Chapter 7 draws together the findings of the previous studies to show how they informed the design of the final intervention. Chapter 8 reports the findings from the testing of the final online self-affirmation intervention to increase fruit and vegetable consumption. Chapter 9 discusses the findings of this thesis in the context of the previous literature.

1.13 Aims and objectives

The aim of this thesis is to deliver an intervention online using self-affirmation technique to increase the acceptance of web-based health information. The primary

target of this intervention is parents with low SES. Therefore this also involves examining parents' day-to-day lives and their current experiences of healthy living highlighting the ways parents use technology, and the barriers they perceive.

The specific objectives are to:

- Examine parents' attitudes and experiences in terms of incorporating healthy practices such as eating a healthy diet and engaging in physical activity into family life.

- Explore the barriers they identify in more detail and to consider them in relation to parents with non-low SES.

- Demonstrate the effect these barriers have whilst also identifying potential strategies parents themselves articulate to avoid or overcome these barriers.

- Understand how and what is viewed as credible online health information so that a website can be developed to suitably present a health message, tailored on the basis of the above findings.

- Ascertain if self-affirmation manipulations are a suitable technique to use in an online environment.

- Develop an online programme to deliver the self-affirmation manipulation alongside the tailored website.

- Relate findings to design and development of future of web-based health interventions.

1.14 Methodology

The methodology in this thesis has utilized a triangulation approach using qualitative methods to inform the website design including thematic analysis of interview data, Q-methodology to explore attitudes, understandings and experiences in more detail and framework analysis to develop a credible health-related website. Quantitative methods are used to pilot the self-affirmation manipulation in an online environment and then to evaluate the effectiveness of the final intervention, developed on the basis of the findings from the other studies.

1.15 Original contributions of this thesis

1. The identification of barriers that parents with low SES living in North East England face, when trying to adopt a healthy lifestyle (study 1-chapter 3).

2. Documenting and verifying these barriers through the use of innovative methodological techniques (study 2-chapter 4).

3. Identifying that online interventions are an appropriate method to intervene with low SES individuals (studies 1 & 2, chapters 3 & 4).

4. Identifying that self-affirmation is an appropriate technique to use in an online environment (study 3-chapter 5).

5. Identifying what constitutes credible web-based health information, both in terms of information content and website design (study 4-chapter 6).

6. Demonstrating that self-affirmation can lead to a change in health related behaviour when incorporated into an online intervention (study 5-chapter 8).

7. Demonstrating that self-affirmation is most effective at changing behaviour in individuals whose baseline behaviour indicates they are most at risk of negative health outcomes (study 5-chapter 8).

1.16 Chapter summary

This chapter has identified the need to tackle health related behaviours such as physical activity and fruit and vegetable consumption in populations with low SES. It has identified these individuals as at a high risk of the negative outcomes associated with poor health related lifestyle behaviours. This chapter has also posited the Internet as a viable delivery mode for health related interventions and has demonstrated that previous research shows the potential for computer or Internet delivered interventions to effect a behaviour change. Furthermore this chapter has highlighted that working with the target population to inform intervention development can promote the efficacy of the intervention. This thesis will use a website to deliver a health message that has been tailored to address the barriers and circumstances voiced by the target population. This chapter also showed that simply presenting information to individuals does not have a large effect on subsequent behaviour. Therefore this thesis will incorporate a technique, self-affirmation, to increase the acceptance of the information presented on the website. Furthermore

this chapter has shown that when developing a website, considerations need to be made about what constitutes a credible website in the eyes of the target audience. This thesis will identify what the target audience perceive as a credible website so that the information on the website is not discredited by the manner in which it is presented.

The following chapter, chapter 2, will present theoretical explanations for why information alerting an individual to a health risk does not always lead to a change in behaviour. Evidence is presented supporting the use of self-affirmation to increase the acceptance of threatening information. Finally this describes an offline study this thesis replicates in a novel online environment.

Chapter 2: Changing behaviour by highlighting a risk

The previous chapter highlighted online health interventions involve delivering a message that highlights links between particular behaviours and risky health outcomes. It also highlighted simply presenting individuals with information does not mean individuals will act in a positive way and change their behaviour accordingly. Furthermore, it was noted alerting an individual to a threat might result in a rejection, rather than an acceptance of a health message. This chapter considers why health messages may not be accepted or acted upon and presents a potential technique, not previously applied in an online intervention to increase the acceptance of a website delivered health message and may subsequently lead to a change in behaviour.

2.1 Behaviour Change

Behaviour change has become a central objective of public health interventions in recent years, as the focus of health service providers shifts from treatment and cures to prevention. As established in chapter 1 many health conditions are caused by engaging in risk behaviours, such as problem drinking, lack of physical activity, substance use, smoking, reckless driving, poor diet and overeating, or unprotected sexual intercourse. A key aim in intervention development is how to predict and modify the adoption and maintenance of healthy lifestyles. Behaviours that put individuals' health at risk can be eliminated by self-regulatory efforts, and health-enhancing behaviours can be adopted instead, such as physical exercise, increased fruit and vegetable consumption, smoking cessation, dental hygiene or condom use Webb et al., 2010). Health behaviour change refers to the motivational, volitional, and behavioural processes of adopting and maintaining health-enhancing behaviours whilst ceasing to engage in behaviours that put one's health at risk.

Over time a variety of behaviour change theories have evolved, which encompass a broad range of activities and approaches, traditionally, these have been what are known as rational choice models. Rational choice models are based on the principle that when presented with information explaining the benefits of behaving in a

particular way, individuals will process that information rationally resulting in the intention to follow the recommended behaviour and a subsequent change in their behaviour. The theory of reasoned Action (TRA; Fishbein & Ajzen, 1975) and its later incarnation, the theory of planned behaviour (TPB; Ajzen, 1991) have dominated much of the behaviour change literature (Sniehotta, 2009), since their adaptation from social psychology. Despite the proliferation of such models they have been criticised for the key assumption that individuals process information in a rational manner. If the overall cognitive response is positive, there will be a change in behaviour; however if the message is not processed rationally and the cognitive response is negative, the attempt to change behaviour fails or even boomerangs. The persuasive effectiveness of a message is a function of the individual's cognitive responses to the message; however as Sniehotta (2009) points out, the TRA and TPB do not propose methods of changing cognitions. This thesis takes the view that simply highlighting a health risk is unlikely to be effective at changing individual's behaviour, in particular when an individual's behaviour is putting them at a high risk of negative health outcomes. The following sections point out, merely highlighting a health risk to an individual will not guarantee that they will adopt the recommended risk reducing behaviour. Subsequently this chapter describe two models that attempt to explain why highlighting a risk may prove to be ineffective, and a potential method for overcoming cognitive responses that limit behaviour change.

2.2 Risk Perceptions

The vast majority of health promotion campaigns are focussed on providing information about the health consequences of particular health related behaviours. This information may come in many forms; leaflets, websites or face-to-face advice from health professionals. The key premise behind the dissemination of health advice is that informing individuals about the potential threats to their health will prompt behaviours to reduce those risks known as risk perceptions. Brewer, Chapman, Gbbons, Gerrard, McCaul and Weinstein (2007, p.136) define risk perceptions as individuals 'beliefs about a potential harm'. Despite the wide spread practice of communicating health risk information there is some conflicting evidence about the effectiveness of such strategies.

One promotion campaign that has utilised the notion of risk perceptions in an attempt to change people's behaviour, is smoking. Warnings, both graphic and written have become a compulsory part of many countries strategies to increase smoking cessation however there is mixed evidence about the success of such campaigns. Hammond, Fong, McDonald, Brown and Cameron (2004, 2006) argued the graphic warnings on cigarette packs had the effect of prompting strong emotional reactions in smokers which they posited lead to increased quitting. However, Hammond et al.'s (2004, 2006) work was heavily criticised by Ruitter and Kok (2005, 2006) who highlighted that causal conclusions were limited as the study was not experimental. Furthermore they argued graphic warnings actually increased fear arousal. This resulted in increased defensiveness to the warning and thus a smaller change in smokers' behaviour than if the graphic warnings were not used. The evidence suggests a complex relationship between risk perceptions and behaviour change. Renner, Schupp, Vollmann, Hartung, Schmalzle and Panzer (2008), argue highlighting a risk to an individual does not mean that individual will feel personally susceptible or vulnerable to that risk. For example the majority of smokers acknowledge smoking is detrimental to people's health (general risk perception) however that is not to say that they feel personally at risk (individual risk perception) of the possible negative health consequences. The importance of personalisation of health messages was touched upon in chapter 1 and will be considered in more detail later in this chapter. Explanations for these opposing viewpoints may come from examining theoretical models of the psychological determinants of health behaviour.

Risk perceptions are a construct that has been considered by models of behaviour change. Two in particular, are specifically developed to explain the impact that health risk information has on behaviour; Protection motivation theory or PMT (Rogers, 1975, Rogers & Prentice-Dunn, 1997) and the extended parallel process model or EPPM (Witte, 1992, 1998). These two models will be considered in more detail in order to better understand the role of risk perceptions in health related behaviour change.

2.2.1 Protection motivation theory

PMT (see Figure 2.1) was originally developed to explain the effects that fear arousing communications had on related attitudes and behaviours (Rogers, 1975). It has, according to Rogers and Prentice-Dunn (1997), been applied across a diverse range of domains above and beyond health related behaviours, including environmental concerns, security behaviours, and political issues. Floyd, Prentice Dunn and Rogers (2000) suggest the concept of protection motivation is applicable to any threat where there is 'an effective recommended response that can be carried out by the individual' (p. 409). PMT, in its earliest form, was based on expectancy value theory (Rogers, 1975) however it was later revised to include reward and self-efficacy variables (Rogers, 1983).
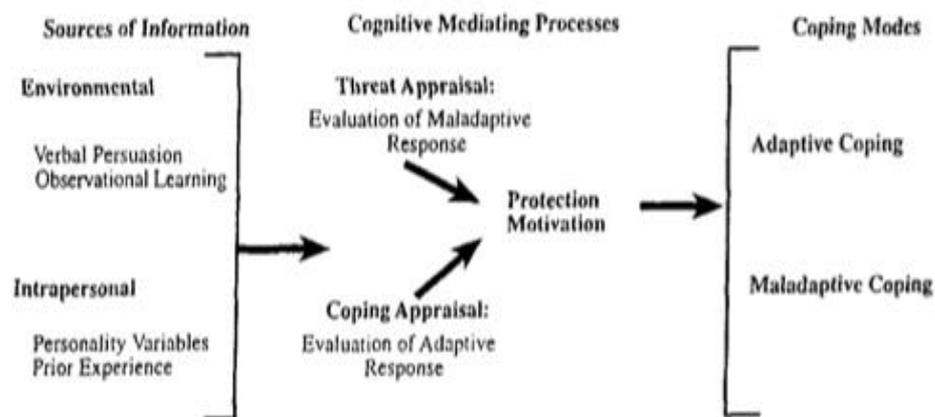
Figure.2.1 Overall model of PMT Floyd, Prentice, Dunn and Rogers (2000)

PMT posits individuals will engage in risk reducing behaviours when they have high *protection motivation*. Floyd, Prentice-Dunn and Rogers (2000) explain protection motivation arouses, sustains and directs behaviour although, like many health behaviour models, it promotes behavioural intentions as the best means by which to measure it (Rogers and Prentice-Dunn, 1997). PMT can be separated into three main processes: *sources of information, cognitive mediating processes* and *coping modes. Sources of information* describe where the threat is identified. The model posits that a risk can be identified through *environmental* sources such as *verbal persuasion* or *observational learning*, or from *intrapersonal sources* where the threat is identified through *prior experience* or *personality variables*. Once a risk has been

identified PMT suggests a *cognitive mediating process* occurs in which two cognitive appraisals are made: *threat appraisal* and *coping appraisal* this is known as the *cognitive mediating process* (see Figure 2.2). A more detailed consideration of this process is given below. The result of the *cognitive mediating process* is *protection motivation.* High *protection motivation* will lead to *adaptive coping* and acceptance of the risk and a potential change in behaviour. Low *protection motivation* will lead to a rejection of the risk and thus little change in behaviour.

Cognitive Mediating Processes
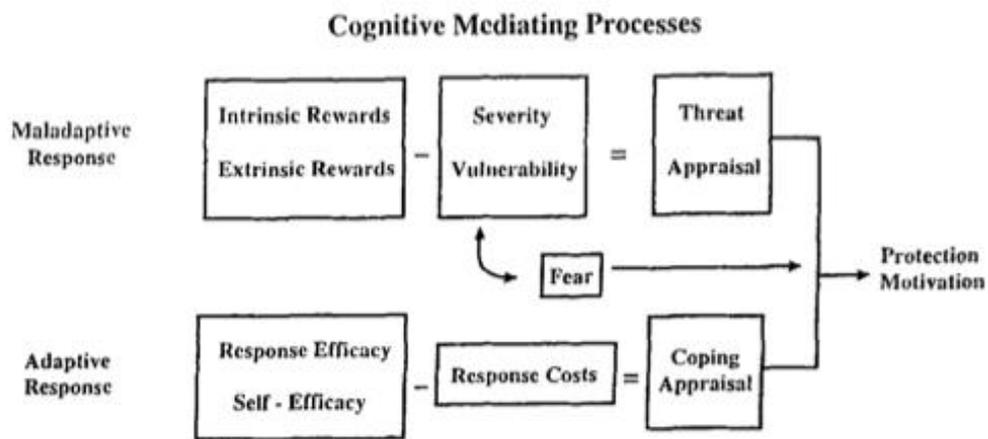
Figure 2.2 Cognitive Mediating Process, Floyd, Prentice, Dunn and Rogers (2000)

Threat appraisal: threat appraisal is concerned with an individual's perception about the risky behaviour. Through evaluating the risk the individual is able to appraise the threat of their behaviour. This evaluation weighs up the *perceived intrinsic* and *extrinsic rewards* associated with the maladaptive response. These are deducted from the individuals' *perceived severity* and *perceived vulnerability* of the negative outcomes associated with the behaviour. *Perceived severity* is associated with the extent of the harm that the individual perceives will occur if they continue with their current behaviour. *Perceived vulnerability* considers the perceived likelihood of the negative health consequences occurring if the maladaptive behaviour continues. The perceived rewards associated with their current behaviour will increase the likelihood of continuing with the maladaptive response. If these rewards outweigh the perceived severity and vulnerability it is likely that threat appraisal will be low.

Coping appraisal: coping appraisal considers the behaviours that will reduce the risks associated with health related behaviours for example smoking. *Response*

efficacy explains the perceived effectiveness of the recommended risk reducing behaviours, that is, how effective the risk reducing behaviours will be at reducing or preventing the negative health consequences. *Self-efficacy* is concerned with the individuals' beliefs about their own ability to engage in the risk reducing/preventing behaviours. According to PMT, these are weighed up against the *response costs*. These describe the individuals' beliefs about psychological, physical, financial, and time costs associated with engaging in the risk reducing/preventing behaviour. Utilising the example of smoking further, individuals may believe smoking causes diseases and by stopping smoking the risk of developing associated diseases would be reduced, they may also feel capable of quitting but may be concerned smoking cessation may lead to weight gain which they view as an undesirable cost.

Coping modes: the outcome of the cognitive mediating process is the intention to engage in an *adaptive response* (initiating or continuing with risk reducing behaviours) or the intention to continue with the *maladaptive behaviour* (not engaging with risk reducing behaviours) these are described as *coping modes*. PMT suggests that it is the interaction between threat and coping appraisals that influence the adoption of risk reducing behaviours. That is, the levels of an individuals' efficacy appraisal dictates the extent to which threat appraisal impacts on motivations. Rogers and Prentice-Dunn (1997) posit, that if an individual has high efficacy appraisals and therefore believes they are capable of adopting risk-reducing behaviours then they are likely to adopt these behaviours if they believe the threat to themselves to be great. However if efficacy appraisal is low and thus the individual does not feel capable of adopting the recommended behaviours then even if the threat appraisal is high, the individual is unlikely to engage in risk reducing behaviours. Rogers (1983, p.170) refers to this paradox, where equipping an individual with the knowledge about the potential negative consequences of a health related behaviour does not lead to a change in behaviour, as the 'boomerang effect'. Whilst Rogers and Prentice-Dunn (1997), suggest some potential psychological processes that may explain this interaction, they offer no consideration as to which of these processes has the most support, to that end, the EPPM may offer further explanation.

2.2.2 The Extended Parallel Process Model

The EPPM (see Figure 2.3) need not be seen as strictly competing with PMT, moreover it attempts to predict when increasing risk perceptions will or will not increase the intention to engage in behaviours that will reduce the risk of negative health outcomes (Witte, 1992). Like PMT, the EPPM is also concerned with the appraisal made of a communicated health risk. A risk is identified through *external stimuli* and EPPM posits various components of the risk message: *self-efficacy, response efficacy, susceptibility* and *severity.* On receiving this, the individual engages in *message processing* through an appraisal of *perceived threat* and *perceived efficacy* much like PMT. However in the EPPM, threat is appraised prior to efficacy (Witte, 1998) and if no threat is perceived further processing will not occur. If an individual considers their susceptibility (perceived vulnerability) to the health threat to be low and they view the threat to be small (perceived severity) their fear is not aroused. The EPPM places greater importance on the fear arousal component in comparison to PMT as it is only if the individuals' fear is aroused beyond a certain threshold do they appraise their own efficacy for the recommended risk reducing behaviours.   The efficacy appraisal in the EPPM is very similar to the coping appraisal in PMT and involves a consideration of the individuals' perceived self-efficacy and response efficacy.
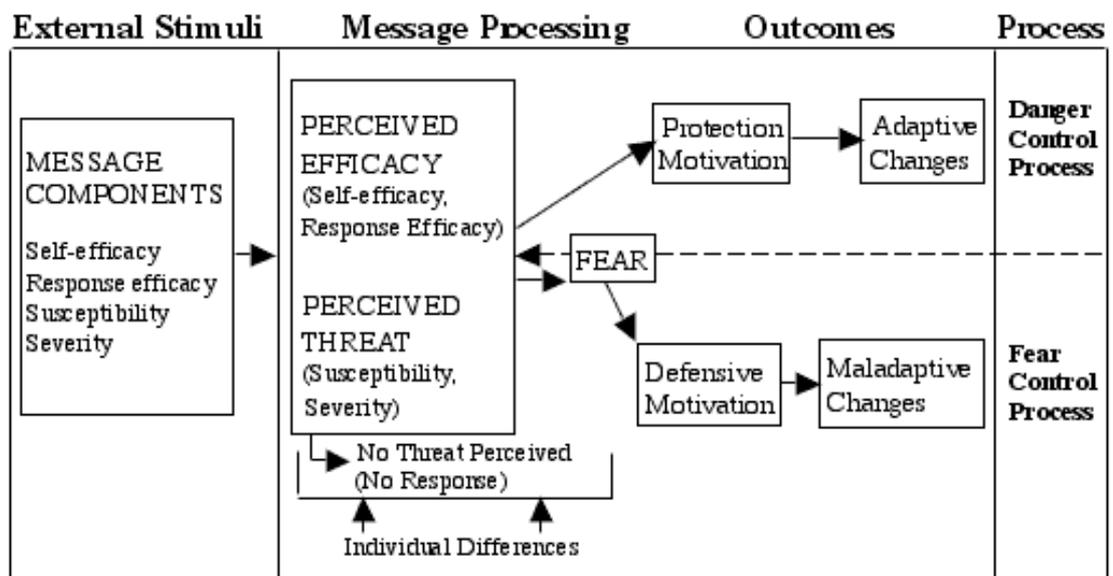
Figure 2.3 The Extended Parallel Process Model (Witte, 1992, 1998)

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According to the EPPM, the individuals' efficacy appraisal will motivate them to engage in either a *protection motivation* or *defence motivation.* *Protection motivation* will lead to *adaptive changes* and the individual is likely to make changes to their behaviour to reduce their risk, this is explained as the *danger control process* and can be likened to the *adaptive response in* PMT. *Defence motivation* will lead to *maladaptive changes* and the individual is unlikely to engage in risk reducing behaviours, this is considered to be the *fear control process.* The *fear control process* is very similar to the maladaptive response described in PMT and individuals who adopt this process will engage in strategies that reduce the fear associated with the health threat.

Witte and Allen (2000) explain the *fear control process* may include *defensive avoidance* (i.e. avoiding thinking about the negative health outcomes), *denial* (i.e. stating that one is not a risk of the negative health outcomes) and *reactance* (i.e. ignoring the health related message believing it to be manipulative). The *fear control process* described by Witte and Allen (2000) offers, to some extent, an explanation of how 'the boomerang effect' occurs. They conclude interventions providing a fear arousing health message will only be successful if individuals have high efficacy for the recommended risk-reducing behaviour. This means messages must consider how they promote risk-reducing behaviour to the individual at which they are aimed. Ensuring the recommended risk-reducing behaviours are suitable for the individuals targeted by the health message and take into account barriers specific to those individuals will help ensure individuals who identify a tangible threat will also experience higher levels of self-efficacy prompting them to make appropriate changes to their behaviour.

2.2.3 Evaluation of PMT and the EPPM

Two key meta-analyses provide both support and critiques of PMT and the EPPM. Milne, Sheeran and Orbell (2000), and Witte and Allen (2000), seek to explore the relationships between the variables both models identify. Inclusion criteria for both of these meta-analyses meant studies were only included if they differentiated between intentions to perform the risk-reducing behaviour and effects on actual behaviour. Milne et al., (2000) included 27 studies all of which focused on health

related behaviours; 15 studies investigated correlations between PMT variables and intentions and behaviour, and 12 studies manipulated variables identified by PMT. It is important to note that correlational studies do not permit causal conclusions being drawn, and only experimental studies can identify if threat appraisals or efficacy appraisals have had an effect on subsequent behavioural intentions or actual behaviour. The inclusion of both correlational and experimental studies by Milne at al., (2000) results in effect sizes that provide less evidence for these changes. Witte and Allen (2000) employed a broader set of inclusion criteria identifying 98 experimental studies focussed on, both health related behaviours and non-health related behaviours. The studies included tested both the EPPM and PMT and a number of other theories relating to perceived threat. All studies included in this meta-analysis manipulated fear or threat and measured intentions, behaviours or attitudes.

The two meta-analyses both provided evidence suggesting the variables identified by the PMT and EPPM have small to medium relationships with both intention to engage in risk-reducing behaviours and actual risk reducing behaviours with intention itself having the largest correlation with concurrent and subsequent behaviour (Milne et al., 2000). Witte and Allen's (2000) findings suggest the threat appraisal variables identified by PMT and the EPPM have small, similar effects on both intention and behaviour. Milne et al., (2000) found a small effect of these constructs on behaviour but found they had a moderate effect on intention when looking at a smaller range of studies all focused on health related behaviours. Witte and Allen (2000) reported small effect sizes for the relationship between self-efficacy and response efficacy and intention/behaviour, similar to those found for the threat appraisal variables. Milne et al., (2000) reported larger effect sizes for the for the efficacy appraisal constructs than the threat appraisal constructs. Interestingly when looking at how successfully interventions manipulated the relevant constructs, both meta-analyses showed response efficacy and self-efficacy were less successfully manipulated than severity and vulnerability. This suggests the constructs that had the greatest effect on intentions and behaviour, self-efficacy and response efficacy (Milne et al., 2000) were the hardest to manipulate. This could possibly be attributed to the intervention techniques employed and potentially the construction and personalisation of the health message. This bolsters the argument

that interventions need to be personally relevant and consider the specific circumstances and barriers of the population the intervention is targeted at. Whilst the meta-analyses provide some support for the danger control process explained by the EPPM they are less able to provide evidence for the fear control process and thus explaining why individuals do not adopt risk-reducing behaviours. According to EPPM (Witte, 1998) those individuals who perceive low self-efficacy in the face of high levels of perceived threat are most likely to provide evidence for the fear control process. However very few studies have included a measure of the fear control process and thus Witte and Allen (2000) were unable to test the threat X efficacy interaction predicted by the EPPM. They were however able to demonstrate that stronger fear appeals were significantly associated with greater defensive responses, weaker efficacy messages and less danger control processes.

Evidence supporting the EPPM and PMT is clearly mixed and some of this may be attributed to design and methodological aspects of the studies included in the meta-analyses. One issue common to much behaviour change research is the dependent variable is often measured as intentions for a particular behaviour, this in itself is problematic as intention to engage in a particular behaviour is not the same as actually engaging in that behaviour. When measures of intention are related to subsequent behaviour many studies fail to set intentions with a specific time frame. This is additionally problematic as the participant may have a different time frame in mind to change their behaviour than that allowed for by the study. For example, an individual may say they intend to improve aspects of their health related behaviour, however saying for example "I intend to stop smoking in the future" is quite different from saying "I intend to stop smoking by the end of the month". What is more, by not assessing intentions within a specified time frame the strength of the relationship between threat appraisals and efficacy appraisals on intentions may be exaggerated. Without setting intentions with a particular time frame such subtleties may be over looked. Furthermore, where behaviour is included as an outcome measure, self-report measures rather than objective measures are the norm.

One major criticism that needs to be considered with regard to studies utilising PMT and the EPPM is that they are based on the assumption that individuals process the information contained in the health message in a carefully considered manner. It is

suggested, by Chen and Chaiken (1999), that attitude change, and thus potentially behaviour change, is the result of two different types of cognitive processing of information and propose the heuristic-systematic model or HSM to explain this process.

2.3 The heuristic-systematic model

The heuristic-systematic model (HSM; Chen & Chaiken, 1999) is of relevance to the health communication domain as it involves exposing individuals to information they have to make decisions or formulate judgments about with regards to themselves and others. The HSM is a dual-process theory, and as Eagly and Chaiken (1993, p.257) explain it is based on the assumption that "attitudes are formed and modified as people gain information about attitude objects". Both Trumbo (2002) and Griffin, Neuwirth, Giese and Dunwoody (2002) suggest it is highly applicable to studies looking at health risk communication as it explores relationships concerned with where people gain risk information, how they process this information and how this may affect perceptions of risk and subsequent behaviour.

The HSM posits that in a situation where a judgment is required people process information *heuristically* (superficially) or *systematically* (effortfully). Eagly and Chaiken (1993) also propose people may use a combination of both *heuristic* and *systematic* strategies when processing the same such messages. The suggestion that *heuristic* and *systematic processing* may occur simultaneously is what sets HSM apart from the similar elaboration likelihood model or ELM (Petty and Wegener, 1999). When considering the communication of health risk information it is important to consider how information is processed, as evidence suggests *systematic processing* leads to the formation of attitudes that are resistant to change and relatively stable over time (Eagly and Chaiken, 1993; Petty and Cacciopo, 1986). Griffin, Dunwoody and Neuwirth (1999) and Kahlor, Dunwoody, Griffin, Neuwirth and Giese (2003) suggest individuals who process health information systematically are also more likely to engage in protective health behaviours. Van der Berg, Timmermans, ten Kate, van Vugt, and van der Wal (2006) suggest this is the underlying process of informed decision making thus making it a highly salient theory when communicating health risk information.

Chen and Chaiken (1999) explain that *systematic processing* requires considerable cognitive effort. In this case individuals examine information carefully and consider it in relation to their existing knowledge and beliefs. It is considered to be an analytical and thorough examination resulting in a judgment. It is suggested decisions resulting from *systematic processing* are based on the actual content of the information (Chen and Chaiken, 1999). In contrast heuristic processing requires minimal cognitive demand from the individual processing the information. Here, Chen and Chaiken (1999) postulate this process utilises simple decision rules that are believed to be learnt and then stored in memory, they give the example "Experts' statements can be trusted" Chen and Chaiken, 1999, p.74). It is believed in this case judgments are made on the basis of more superficial judgments such as message length, message source or emotion, rather than particular judgment-relevant information (Chen and Chaiken, 1999).

It is posited by the HSM that whether information is processed *systematically* or *heuristically* is determined by two general processing modes, one cognitive and one motivational. The key cognitive determinant of processing mode is the individual's ability to process the information. Given that *systematic processing* requires greater cognitive demand. Eagly and Chaiken (1993) suggest it is more likely to be affected by situational factors and individual differences that may inhibit or reduce more detailed processing of the information. Research (Eagly and Chaiken, 1993; Chen and Chaiken, 1999; Kahlor et al., 2003) suggests variables such as lack of prior knowledge about the topic, time constraints when presented with the information, perceived concerns about obtaining further relevant information, low personal significance of the topic, low need for cognition and ambiguity in the argument contained in the message may limit *systematic processing*. In addition to cognitive capacity, there are several motivational determinants of processing mode, including *accuracy, defense* or *impression motivation*, as well as *information sufficiency* (Chen and Chaiken, 1999).

The HSM is based on the principle that assumes, when processing information people are economy-minded souls who employ the most efficient strategies to meet their goals (Chaiken, 1987). The principles of least effort and sufficiency principles

reflect this motivational assumption of the model (Eagly and Chaiken, 1993). The least effort principle claims individuals favour less effortful information processing strategies to more effortful ones, meaning the *heuristic processing* is more likely to take place than *systematic processing* (Eagly and Chaiken, 1993). As Etchegary and Perrier (2007, p.427) state it is considered "the default strategy in most judgment situations". Despite this, it is also postulated that people have other motivational processing goals such as the desire to support current attitudes and to make accurate judgments. When individual's process information, they must find a balance between minimizing the effort required to process the information and satisfying their *motivational goals*, this is accounted for by the models *sufficiency principle* (Eagly and Chaiken, 1993). This sufficiency threshold is defined as; the degree of confidence a person desires to have when making a judgment about information they receive (Etchegary & Perrier, 2007). This means individuals will engage in *systematic processing* when *heuristic processing* does not allow them sufficient confidence in their judgment about the information.

The original version of the HSM (Chaiken, 1987) assumed people are motivated to hold accurate attitudes and beliefs so their view of the world is objectively valid and fits with relevant facts. If motivation is low or cognitive capacity is limited, individuals who are accuracy-motivated simply base their judgments on heuristic-cue information that is fitting with their accuracy goals such as the earlier example of "experts can be trusted". More recent versions of the HSM (Eagly and Chaiken, 1993; Chen and Chaiken, 1999) propose two additional motivational goals that may exist alongside, or even supersede, accuracy goals: *Defense* and *impression motives*.

Impression motivation is defined as the desire to express socially acceptable attitudes. Eagly and Chaiken (1993) propose impression motivation arises in situations where social relationships are important, when significant audiences' identities are salient or where the individual must communicate or justify their beliefs to others. This is summarised by Chen and Chaiken (1999, p.78) "impression motives elicit a consideration of the interpersonal consequences of expressing a particular judgment in a given social context". Like accuracy and defense motivations, impression motivation also determines whether heuristic or systematic (biased or unbiased) processing will take place.

Defense motivation is defined as the desire to defend or form a particular attitudinal position (Eagly & Chaiken, 1993). Defense motivation is aroused by variables such as personal wishes, hopes, desires, ego-involvement and vested interests (Eagly and Chaiken, 1993). This may lead to a biased processing of the information in a way that best satisfies such defense concerns (Chen and Chaiken, 1999). It is particularly relevant to mention that some researchers suggest attributes such as health are closely related to the self-concept and represented a relevant situation for defense motivation (Liberman & Chaiken, 1992; Giner-Sorolla & Chaiken 1997). Defense motivation affects processing in a similar way to accuracy motivation. However, rather than the sufficiency of defensive processing being determined by increasing confidence in the accuracy of the conclusions drawn about the information it is determined by the sufficiency of a defensive processing strategy to increase confidence in a conclusion that is consistent with material interests or self-defining beliefs of the individual which is preferable to them (Giner-Sorolla & Chaiken, 1997). Giner-Sorolla and Chaiken (1997) conclude biased processing strategies are preferred to more balanced strategies, since they are more effectual in reaching defensive sufficiency. This may result in strategies that find fault in an argument presented within the information or messages that contradicts or opposes their personal beliefs (Giner-Sorolla and Chaiken, 1997).

What is of particular relevance to this thesis is the notion that "When defense motivation is high and cognitive resources are available, defense-motivated systematic processing is likely to emerge, characterized by effortful but biased scrutiny and evaluation of judgment-relevant information" (Chen and Chaiken, 1999, p. 78). This is particularly important as if health threat information is processed in a defensive manner individuals may be less likely to adopt the recommended risk reducing behaviours. Given the prevalence of interventions providing risk identifying health messages it would be advantageous if defensive processing could be reduced. Self-affirmation (SA) theory (Steele, 1988) may provide a means to reduce the defensive processing of a health related message.

2.4 Self-affirmation theory

Self-affirmation theory (Steele, 1988) was developed, based on the principle that people have a fundamental need to maintain a positive, global self-evaluation. When people receive a threat to this self-concept they are motivated to reduce the psychological discomfort they experience (McQueen and Klein, 2006). As identified earlier in this chapter threats to one's self concept may include identifying threats to ones health, particularly those that arise from behaviours that can be modified. The requirement to modify an integral part of one's lifestyle and thus self-concept may prompt biased processing of the information pertaining to the threat. Steele (1988) proposed a theory and a method by which an individual's self-concept or positive, global self-image can be restored in light of the perceived threat. The theory posits by affirming an important aspect of the self that is not related to the threatened domain, biased processing of the information is reduced and thus the threat outlined in the message is more likely to be accepted. Steele, Spencer and Lynch (1993) propose self-affirmation may function as a coping resource or a buffer when self-concept is threatened.

The previous section of this chapter highlighted when people receive information about a potential threat to their health, they may respond to the threat in away that down plays the threat itself because of biased defensive processing of the information. This defensive judgement of the message helps individuals to maintain their perceived self-integrity as it reduces the strength of the perceived threat. Steele (1988, p.262) proposes people seek to maintain their *global self-integrity* which is defined as 'a phenomenal experience of the self…as adaptively and morally adequate, that is competent, good, coherent, unitary, stable, capable of free choice, capable of controlling important outcomes' rather than their situational or domain specific worth. Sherman and Hartson, (2011, p.129) explain self-integrity should not be confused with self-esteem or a positive feeling about oneself 'but as quality possessed by the "self-system"'.
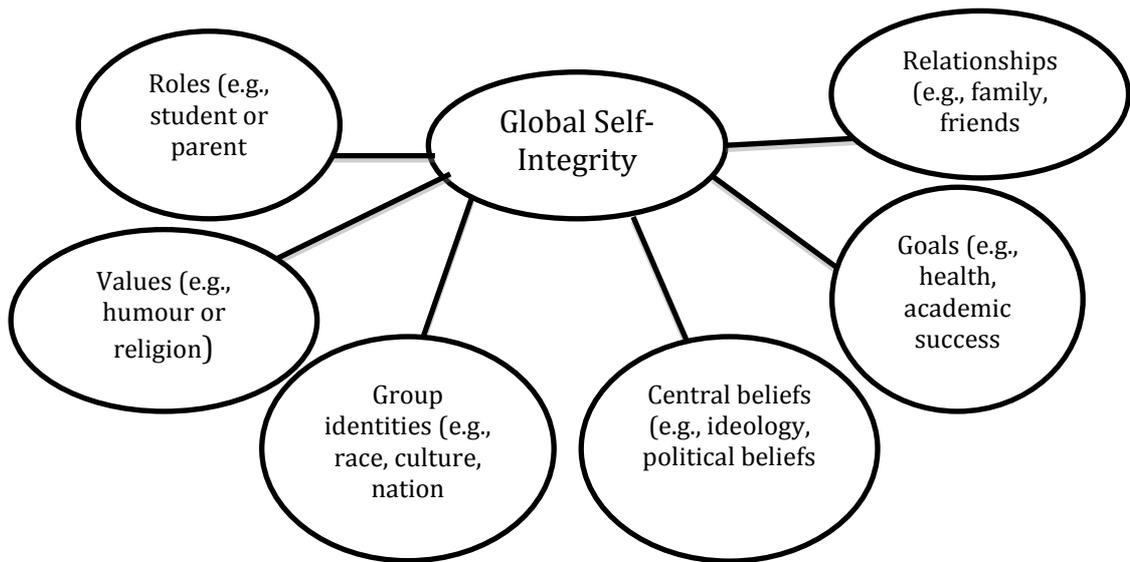
Figure 2.4 Schematic representation of self-system (Sherman and Hartson, 2011)

The *self-system* (Figure 2.4) is made up of different domains that are integral to the individual. These include values, roles, group identities, central beliefs, goals and relationships. Sherman and Cohen (2006) explain the purpose of the self-system is to maintain global self-integrity; if a threat to one or more of the domains is received an individual is prompted to reaffirm their sense of self-integrity. A threat may be dealt with by rationalising one's behaviour in the context of the threatening information, for example, "I may not eat a low fat diet, but I do exercise, so that makes up for it". The self-system is flexible so that if an individual can affirm a different aspect of their self-integrity, other than that which is threatened, the threat itself will be reduced. This reduces the need for rationalisation of the threatening information and prompts acceptance of the threat because their global self-integrity has been preserved. There is a significant amount of research evidence self-affirmation can be induced experimentally through writing about important values and this can reduce the biased processing of information perceived as threatening (for reviews, see McQueen & Klein, 2006; Sherman & Cohen, 2006; Steele, 1988). The rest of this chapter will consider the experimental support for self-affirmation theory and self-affirmation manipulations with a focus on health related behaviours and will lead onto a more detailed examination of a self-affirmation study that prompted an increase in participants' fruit and vegetable consumption over the course of seven days, findings this thesis attempts to replicate.

2.4.1 Research support for self-affirmation and message acceptance

In a recent review of self-affirmation manipulations by Harris and Epton (2009) they found 18 published and in press articles containing 22 studies testing the effects of self-affirmation on health related affect, cognition and behaviour. The majority of articles utilised a "two-study" paradigm where participants are randomly assigned to either the experimental or self-affirmation condition or a control condition. Participants are then presented, usually under the guise of an unrelated study, with information about a potential health risk. As Harris and Epton (2009) point out it appears to be essential participants are unaware of the impact of self-affirmation on their judgement of the information in order for the self-affirmation process to be effective, a notion further supported by Sherman, Cohen, Nelson, Nussbaum, Bunyan and Garcia (2009). This is an important point to consider as it distinguishes experimental self-affirmation manipulations from the more commonly understood definition of self-affirming by which individuals consciously boost their self-regard by consciously making self affirming statements. Studies therefore focus on the preventative potential of self-affirmation as participants experience the self-affirmation manipulation prior to receiving the information about a potential health threat.

Whilst, as Steele (1998) highlights self-affirming is a flexible process and some studies are esteem based however the majority employ a values exercise where by in the experimental condition participants are asked to reflect on an important value. This is either done through the use of relevant value scales or by writing about a value that is important to them (Harris & Epton, 2009). In the control condition participants either complete a scale of less relevant values or are asked complete a writing exercise about a non-value related topic. Napper, Harris and Epton (2009) and Sherman and Cohen (2006) propose that self-affirmation manipulations are designed to (a) make a central and positive aspect of individuals' self-concept salient, (b) provide a reminder of "who you are" and (c) offer reassurance that self-worth can be gained from other aspects of the self other than that which is threatened by the information presented.

In their review, Harris & Epton (2009) identified studies that had occasionally used a fictitious health message such as Crocker, Niiya and Mischkowski (2008), the majority concerned real health threats. The threats are typically presented as articles, leaflets, images and sometimes video, containing a persuasive message. The message should be designed to be relevant to at risk participants and be personally relevant to them as suggested by PMT and the EPPM. 'At risk' means those whose current behaviour is conducive to negative health outcomes, and whose health would benefit from taking the recommended risk-reducing actions. Their current behaviour is typically assessed through self-report or objective measures, such as cigarette or alcohol consumption. They may not currently perceive themselves at risk. It is expected participants most at risk (whether they perceive it or not) of the threat described in the message will respond by processing the message in a defensive, biased manner as explained the HSM. This should mean they are less accepting of the message than, for example those for whom the message has less personal relevance, and react to it in a defensive manner (Good & Abraham, 2007). An assumption of proponents of self-affirmation theory is that the process reduces this defensiveness, thus increasing message acceptance. It may also increase people's perceptions of their own vulnerability to, or the severity of, the threat, and not just their acceptance that the threat exists. Typically, the threat of the message is not measured directly, rather it is inferred from the differing responses from the experimental and control groups to the message (Harris & Epton, 2009).

It is apparent that given the predicted affects of self-affirming as outlined above, it should be most beneficial to those who are most at risk. It may also be that the benefits of self-affirmation are limited to these individuals. Harris and Epton (2009, p.969) warn this may lead to difficulties in interpreting null results, as a failure to obtain significant effects from a self-affirmation manipulation 'may stem from (1) a lack of defensiveness among non-affirmed participants (2) the arguments being weak or otherwise unpersuasive (3) insufficient power to detect effects or (4) failure of the manipulation to induce self-affirmation'. Manipulation checks have not always been included due to concerns they may induce manipulation in non-affirmed participants (McQueen & Klein, 2006; Schwinghammer, Stapel & Blanton, 2006). Harris and Epton (2009) identify only two studies where the authors conclude self-affirmation failed (Fry & Prentice-Dunn, 2005; Dillard, McCaul & Magnan 2005).

Harris and Epton (2009) argue there is good support self-affirming leads to greater acceptance of a message about a personal health risk and reduces message derogation. In order to assess the extent to which a message has been accepted researchers have used direct questions, for example Crocker et al. (2008) asked participants "to what extent do you think the conclusion of the article was justified on the basis of existing research findings". In other cases they have used statements about personal beliefs to infer message acceptance. Reed and Aspinwall (1998) used the item "I believe that women should take steps to reduce their daily caffeine consumption in order to prevent the development of [Fibrocystic Breast Disease]. In most cases self-affirmation does increase acceptance when measured in this manner (van Koningsbruggen, Das & Roskos-Ewoldsen, 2009; Armitage, Harris, Napper & Hepton, 2008; Sherman, Nelson & Steele, 2000). Although in some cases these measures have not demonstrated higher message acceptance amongst self-affirmed participants (Dillard, et al. 2005; Harris & Napper, 2005). In this thesis a manipulation check developed by Napper, Harris and Epton (2009) will be employed to ensure participants have self-affirmed. This self-report item tests whether positive, central, and valued aspects of the self-concept were more salient to self-affirmed participants' than non-affirmed. Establishing these aspects were significantly more salient in the self-affirmed participants than non-affirmed suggests the self-affirmation manipulation has been successful

Similar support exists that self-affirmation reduces message derogation. Van Koningsbruggen and Das (2009) found self-affirmed, at risk participants derogated a message about type II diabetes less than their non-affirmed counterparts. Jessop, Simmonds and Sparks (2009) also found a similar effect when self-affirmed women who sunbathed regularly rated a message about skin cancer and sun safety. They found these women rated the message as less overblown, exaggerated, manipulative, and straining the truth. It is important to note that accepting a risk exists is very different from accepting that one is personally at risk. As Weinstein (1988) points out a message that is viewed as being personally relevant is an essential step in changing behaviour.

There is some research evidence that self-affirming may also increase the extent to

which participants view a message as personally relevant. Harris and Napper (2005) reported that after self-affirming women who were heavy drinkers found it easier to imagine themselves having breast cancer than non-affirmed heavy drinking women. In another study, smokers stated graphic on-pack smoking warnings were more personally relevant to them than a group of non-affirmed smokers (Harris, Mayle, Mabbott & Napper, 2007). Self affirmed participants have also showed increase personal risk perceptions after reading a health message. Harris and Napper (2005) found self-affirmed participants had higher self-risk judgments for breast cancer as a result of alcohol consumption. Sherman, Nelson and Steele (2000) found the same effect for HIV related self-risk perceptions. In contrast, Harris et al. (2007) in their study with smokers found self-affirmed participants did not rate their self-risk as higher than non-affirmed participants after viewing graphic warnings on cigarette packets. Although in this study the authors point out non-affirmed participants did show evidence of defensiveness across several measures, leading the authors to conclude self-risk measures may not have been sensitive enough (Harris et al., 2007).

According the Harris and Epton (2009) controlling negative affect, such as anxiety and fear, is a key factor in the rejection of a message identifying a health-risk.   As demonstrated by the EPPM, it is engaging in the fear control process that inhibits an individual from engaging in danger control and thus adopting the relevant risk reducing behaviours (Witte, 1992; 1998). Whilst there is need for better clarity about the role of negative affect in the self-affirmation process, several studies have found self-affirmed participants report greater negative affect after being presented with a health-risk message than non-affirmed (Harris & Napper, 2005; Harris et al., 2007; Jessop et al., 2009). This, as Harris and Epton (2009) state suggests less fear control. However they go on to highlight it is not clear if this is because self-affirming increases negative affect directly or if it functions by augmenting the accuracy with which people report their affective experience.

Less attention has been paid to the role of positive affect in the self-affirmation process. Sherman et al. (2000) found self-affirmed participants had more positive ratings on a self-feeling item than non-affirmed participants, possibly as a result of thinking about their own positive characteristics. However, Jessop et al., (2009) using the same measures, found self-affirmed participants had less positive self-

feelings than non-affirmed participants. This supports the hypothesis that when people face a threat, positive self-feelings, as a resource, are expended (Reed & Aspinwall, 1998; Raghunathan & Trope, 2002). Interestingly whilst feelings and emotions may play a role in mediating the self-affirmation process it would appear mood does not. Across both health related studies and self-affirmation studies more widely, self-affirmation has not affected feelings of general mood (Sherman and Cohen, 2006; Harris & Napper, 2005; Sherman et al., 2000). Studies potentially need to employ measures that highlight different aspects of mood. Sherman and Cohen (2006) also highlight findings, across self-affirmation studies, concerned with other potential mediators such as self-certainty, confidence and self-esteem have proved to be inconsistent. It is plausible self-affirmation affects aspects of individual's feelings, emotions and mood indifferent ways perhaps dependent on the behaviour under investigation or the strength of certain aspects of the health-risk message. Investigators have offered a range of plausible mediators including mood, state self-esteem, confidence, and self-certainty, but no consistent mediators have emerged across studies (Sherman & Cohen, 2006). It is important to note that whilst it is useful to consider the constructs that mediate the self-affirmation, this is not a key concern of this thesis, as the primary goal is to use self-affirmation to induce a change in behaviour.

Whilst the evidence seems to suggest self-affirming effects the way in which at-risk individuals process a health-risk message, there is less evidence about how it does so. The key hypothesis suggests self-affirming promotes greater open-mindedness (Harris and Epton, 2009). Typically research has focused on measuring the effect of self-affirmation in terms of message acceptance, intentions and relevant behaviours. Despite this, some studies have incorporated measures that may provide an insight into how self-affirmation affects the manner in which health-risk information is processed. Whilst this thesis will not directly attempt to add to this literature it is useful to consider the manner in which self-affirmation affects message processing

2.4.2 How does self-affirming effect the processing of threatening information

Dillard et al. (2005) coded open-ended responses to identify the views of participants on graphic anti-smoking warnings. Non-smokers viewed on-pack, anti-smoking

warnings as more likely to be effective at reducing smoking than smokers did. However self-affirmed smokers saw them as being more effective than non-affirmed smokers. Study 3 in Napper, et al. (2009) showed participants who had self-affirmed made significantly more statements accepting personal relevance of a health message about alcohol and breast cancer than they did statements denying the personal relevance, non-affirmed participants were more inclined to make statements denying personal relevance. Both of these studies support the notion that defensive processing was reduced in the self-affirmed participants. In Reed and Aspinwall (1998) they presented a message (about the risks of fibrocystic disease (FBD) from caffeine) in which they separated passages into risk confirming, risk disconfirming and neutral. The passages were piloted to ensure they were of equal strength. The risk confirming passage was rated significantly more convincing than the risk disconfirming passage, by self-affirmed participants. Non-affirmed participants rated them as equally convincing. This may support the notion of reduced defensiveness in the self-affirmed participants. It may also mean that the self-affirmed participants were actually overly critical of the risk disconfirming passage rather than less biased, as the passages were of equal strength (Harris and Epton, 2009).

There is also some evidence the self-affirming process increases the availability of cognitions related to threat. In a further study (Klein & Harris, 2009) self-affirmed, female participants who were moderately heavy smokers, demonstrated an attentional bias towards words taken from an article they had previously read that linked alcohol consumption with breast cancer. Of further interest is non-affirmed participants demonstrated avoidance by showing an attentional bias away from these words. Further to this, no attentional bias was evident for threat words that did not appear in the message. Klein and Harris (2009) suggest that the effect of the self-affirmation was threat specific.

As Harris and Epton (2009) point out there is good evidence self-affirmed participants are more able to accept and engage with threatening or risk confirming messages, it may even be this material is more cognitively available to them, although this needs further support. Despite this, it would seem self-affirmed participants do not spend longer reading the health risk message than non-affirmed

participants. In fact, in Reed and Aspinwall (1998) self-affirmed participants spent the least time reading the health-risk information and the non-affirmed the most but Harris and Epton (2009, p. 973) criticise this study for being a "statistically liberal one-tailed tests of planned comparisons". In addition, Dillard et al. (2005) found no difference in reading times between affirmed and non-affirmed participants. Interestingly there is also evidence self-affirming may make people more willing and seek out threatening information. Self affirmed participants have been shown to find their way to the passage that was risk confirming at least twice as fast as the control group of non-affirmed participants (Reed & Aspinwall, 1998). It may be however, they actually spent less time reading the risk disconfirming or neutral passages, rather than demonstrating a readiness to confront the threat (Harris & Epton, 2009).

There is some evidence self-affirming: reduces defensiveness, increases the relevance of a health risk to at-risk individuals, increases the accessibility of threat related cognitions, and increase peoples readiness to engage with a threatening message. Harris and Napper (2009) conclude studies need to further investigate how self-affirmation modifies the processing of health-risk information and in particular if and how it promotes open-mindedness. Whilst these are important considerations for researchers to make this thesis is primarily concerned with the potential for self-affirmation to induce a change in individuals' behaviour. The following section reviews the current literature concerning the impact of self-affirmation on health related behaviour change is presented and discussed.

2.5 Self-affirmation and health related behaviour change

The above literature has demonstrated some evidence self-affirmation increases the acceptance of uncongenial health-risk information. However, the benefits of this are limited and what is actually important is whether or not this leads to changes in people's behavior, after all, there is little point in making people more accepting of a health message if they don't subsequently intend to change their own behaviour. As established previously in the discussion about PMT and the EPPM, the majority of models related to behaviour change assess the impact of modifying their various variables by measuring intentions to perform the recommended risk-reducing behaviour (Conner & Norman, 2005). It has become a key focus of self-affirmation

researchers to look for changes in intention in self-affirmed participants or to look for differences in the intentions to perform recommended behaviours between self-affirmed and non-affirmed participants.

The first study in a health related domain that investigated whether self-affirming lead to greater intentions to perform risk-reducing behaviour provided results that are confusing considering the findings of subsequent studies. Reed and Aspinwall (1998) reported whilst self-affirmed participants who consumed higher levels of caffeine, appeared to accept the health risk message more than non-affirmed participants, they actually scored lower on measures of intention to reduce their caffeine consumption. Subsequent studies have had different findings and with the exception of Fry and Prentice-Dunn (2005) the majority of studies have found that self-affirmation resulted in higher intentions to perform risk-reducing behaviours when compared to non-affirmed participants (van Koningsbruggen & Das, 2009; van Koningsbruggen et al., 2009; Armitage et al., 2008; Harris et al., 2007; Harris & Napper, 2005, Sherman et al., 2000). Other studies have demonstrated less clear findings with differences in measures of intention approaching significance (Epton & Harris, 2008) and some studies finding no differences in intentions between affirmed and non-affirmed participants (Harris et al., 2007; Dillard et al., 2005).

As previously discussed, PMT views intention to engage in risk reducing behaviours as a form of adaptive coping. Other studies have inferred intentions to perform risk-reducing behaviours by assessing indicators of maladaptive coping such as avoidance. Some studies have reported that self-affirmed participants scored lower on measures of avoidance than their non-affirmed counterparts. Napper et al. (2009) found that affirmed participants reported thinking deeply about the message linking alcohol and breast cancer significantly more than they tried not to think about it that the non-affirmed participants did. Fry and Prentice-Dunn (2005) reported similar findings as self-affirmed participants reported avoiding thinking about the health-threat less than non-affirmed participants. They also demonstrated self-affirmed participants had lower ratings of hopelessness than the control group. Other studies have looked at factors that predict intentions such as, perceived behavioural control (PBC), positive attitudes towards risk reducing behaviours response efficacy, self-efficacy, ratings of seriousness of risk and subjective norms. These studies have had

mixed findings although Harris and Napper (2005) suggest ceiling effects may explain some of these mixed findings.

Reed and Aspinwall's (1998) findings suggest self affirming may raise perceptions of control (Harris & Napper, 2005) as self-affirmed participants who were higher caffeine consumers had the same level as perceived control as self-affirmed low caffeine consumers but both had higher levels of perceived control than non-affirmed participants. Harris et al., (2007) reported in self-affirmed participants PBC for smoking cessation was higher than it was in non-affirmed participants. However in contrast Harris and Napper (2005) found self-affirming had no affect on PBC for reducing alcohol consumption following the message linking breast cancer and alcohol consumption.

The effect of self-affirmation on positive attitudes towards risk-reducing behaviours is also unclear, Jessop et al., (2009) found non-affirmed participants had less positive attitudes towards the use of sunscreen than affirmed participants. Harris and Napper (2005) however, reported self-affirmation had no effect on attitudes towards smoking cessation.

Few published studies have measured self-efficacy, which is rather surprising considering the amount of attention paid to self-efficacy in the behaviour change literature. However those that have included a self-efficacy measure (Jessop et al., 2009; Epton & Harris, 2008 & Harris et al., 2007) have found it was higher in self-affirmed participants than non-affirmed participants. Response-efficacy measures have also been included as a predictor of intentions. Some studies have deliberately tried to focus on response efficacy in their health message by bolstering evidence that taking the recommended risk-reducing behaviours will reduce the risk posed by the health threat. Epton and Harris (2008) found ratings of response-efficacy where higher amongst self-affirmed participants than the control group. Jessop et al. (2009) also found that affirmed participants who were not using sunscreen had higher ratings of self-efficacy following a health message explaining the benefits of using it. This suggests that the persuasiveness of the message was improved by the self-affirmation process (Harris & Epton, 2009).

Other measures seen to predict intentions have not been affected by self-affirmation, one such measure is ratings of seriousness of risk. Napper et al. (2009) coded participants' beliefs about the seriousness of a health message linking alcohol consumption and breast cancer and found no effect of self-affirmation on how serious participants thought the message was. Dillard et al. (2005) reported similar findings with no effects of self-affirmation on ratings of the risks associated with smoking after viewing on-pack anti-smoking warnings. Although it is worth noting that Harris & Epton (2009) point out across these studies mean ratings of risk were high across all groups suggest potential ceiling effects.

Intention to change ones behaviour in order to reduce potential health risks are a common measure used to judge a successful intervention. However, intention is not necessarily a good predictor of subsequent behaviour. A more useful measure is whether or not self-affirmed participants actually subsequently change their behaviour. Some studies have been able to measure immediate behaviour change post manipulation; fewer have looked at change over time. Support for the impact on self-affirmation on both immediate and subsequent is varied, with support for longer term behaviour change being greater when the technique has been used in non-health related domains, however some evidence from health domains is beginning to appear.

Several studies have suggested some immediate behaviour change effects. In study 2 of Sherman et al. (2000) participants who had self-affirmed took more leaflets concerning HIV and bought more condoms than non-affirmed participants. Similarly, in Armitage et al. (2008) participants were offered leaflets containing smoking cessation advice and more self-affirmed participants took the leaflets than non-affirmed. It could however be argued, these behaviours demonstrate intention to make a change in behaviour rather than actually showing a change in behaviour. Van Koningsbruggen and Das (2009) provided health risk information about type II diabetes. Self-affirmed high-risk participants were more likely to follow a link to an online diabetes test than non-affirmed high-risk participants. Moreover participants who affirmed but were not at risk were less likely still to click on the link, suggesting personal relevance may have mediated the effects of self-affirmation. This once again bolsters the suggestion that self-affirming is most effective for at risk

individuals.

Longer-term behaviour change following self-affirmation has been demonstrated more successfully in non-health related domains. For example, Cohen, Garcia, Apfel, and Master (2006) reported that the grades of self-affirmed African American students improved significantly and reduced the racial achievement gap by 40%. However, results in the health domain have not been quite so successful. Reed and Aspinwall (1998) in their study concerned with caffeine consumption and Fibrocystic Breast Disease found no differences in participants' reported caffeine consumption 1 week post-manipulation. Similar findings were reported by both Harris and Napper (2005) and Harris et al. (2007), finding no differences in participants' self-reported relevant behaviours, one-week post manipulation. Of particular relevance to this thesis, a recent study (Epton and Harris, 2008) found self-affirmed participants self-reported fruit and vegetable consumption was significantly higher for seven days post-than their non-affirmed counterparts. This study will be presented in more detail later in this chapter, however it is interesting to highlight in this study the health message focused on behaviour that promoted health, rather than on the damaging behaviours that health related studies had previously focused on. In addition the message was designed to address aspects of threat, self-efficacy and response efficacy, targeting key points on the pathway to change. Epton and Harris (2008) propose it was the emphasis of these elements in the message that may have translated intentions into actual behaviour. Harris and Epton (2009) point out that much more research is needed in order to gain a clearer picture about the potential for self-affirmation to go beyond increasing message acceptance and change behaviour in the longer term. The problem of intentions not translating into behaviour is certainly not exclusive to the self-affirmation literature and as Harris and Epton (2009) point out there is no theoretical basis to suggest self-affirmation will be able to close the intention-behaviour gap more successfully that other interventions or manipulations. There is a complex array of reasons why people's intentions do not translate into behaviour (Sheeran, 2002) including many external factors that create obstacles the self-affirming process won't enable people to overcome. It would appear that self-affirmation would be appropriately viewed as a motivational (goal setting) process, as opposed to a volitional (goal striving) process (Schwarzer, 1992). It is suggested (Harris & Epton, 2010) that self-affirming acts as

a motivational manipulation as it increases people motivation to change when they receive a strong message. The notion of motivation to change has been explored in some studies, and even when subsequent behaviour has not changed, self-affirmed participants motivations to change remained higher than non-affirmed participants (Harris et al., 2007) and vulnerability perceptions about risk for breast cancer from alcohol remained higher one-month post manipulation in self-affirmed participants.

It has been highlighted in this chapter self-affirming seems to have greater effects on participants who are most at risk of the health threat. This hypothesis is particularly interesting as those whose behaviour puts them at most risk are usually the hardest to persuade and in the greatest need of change (Weinstein, 1988; Croyle, Sun & Hart, 1997; Lieberman & Chaiken, 1992; Kunda, 1987). This is also of particular significance for this thesis given that the target population, parents with low SES living in the North East of England, typically have poor health related behaviours, as established in chapter 1.

Several self-affirmations studies have shown more pronounced effects of self-affirmation in individuals considered most at risk. Harris and Napper (2005) reported that for self-affirmed heavier drinkers the impact on negative affect, intentions, imagination and risk was greater than for self-affirmed participants who where low risk drinkers. Armitage et al. (2008) reported the impact of self-affirming on intentions and message acceptance was higher in moderate smokers than light smokers, Harris et al, (2007) found the same effects. Van Koningsbruggen and Das (2009) found similar effects with self-affirming reducing message derogation, raising intentions and increasingly the likelihood that participants clicked on the link to the online diabetes test in higher risk participants. Interestingly, for lower risk participants, self-affirming lead to lower intentions and likelihood of clicking the link, suggesting some form of reinforcement that their current behaviour was not putting them at risk so motivation to change was actually reduced. Harris and Epton (2009) highlight this as noteworthy as individuals are likely to have a less clear picture of their personal risk for diabetes than they would for say alcohol or cigarette consumption. There are some exceptions however, with baseline consumption not moderating the effects of self-affirmation in Epton and Harris (2008) and the interaction effect on intentions was not significant. Some researchers have suggested

the effects of self-affirmation maybe limited to a moderate threat level with Klein and Harris (2009) finding the effects of self-affirmation on intentional bias in moderate drinkers but not heavy drinkers. Van Koningsbruggen et al. (2009) has also suggested that self-affirmation promotes more objectivity when a threat is moderate than when it is high or low, claiming the effects of self affirmation are limited to moderate levels of threat. However more research is needed to explore these inconsistencies.

2.6 A specific consideration of Epton and Harris (2008)

As mentioned earlier in this chapter, one self-affirmation study is of particular interest to this thesis. Epton and Harris (2008) looked at the effects of self-affirmation on fruit and vegetable consumption over seven days.

The study that aimed to test two hypotheses; primarily they predicted self-affirmed participants would adhere more closely to the behavioural recommendation contained in a health-risk message. Secondly they tested to see if the effects induced by self-affirmation were mediated by self-efficacy and response efficacy. Participants were recruited on the premise they were taking part in a series of unrelated studies. Prior to randomisation to condition, participants were interviewed under the guise of a health study to establish their baseline fruit and vegetable consumption and their stage of readiness to change (Laforge, Green & Prochaska, 1994). Participants were then randomised to condition and presented with a pack containing either the self-affirmation task or the control task. The self-affirmation task used the method employed in Reed and Aspinwall (1998) and Armitage et al, (2008). In this task participants are encouraged to think about and give examples of a past act of kindness by posing a series of yes/no questions such as "Have you ever forgiven another person when they hurt you?" When participants answered yes to any of the questions they were asked to write down a specific example of their behaviour. In the control task participants had to complete a similar task but were asked for their opinions on a series on unrelated issues, such as "I think chocolate is the best flavour of ice cream". Again when they answered yes to any of these questions they were asked to elaborate on their answer.

Participants were subsequently presented with a health message developed from the U.K. government "5-a-day" website. The message, designed with a student sample in mind, outlined the benefits of fruit and vegetable consumption and focused on how consumption is thought to promote health. The message was designed to promote response-efficacy by providing practical suggestions for how participants could increase their consumption such as "Add fruit to your breakfast cereal" or "Keep a stock of fruit and vegetables sticks for snacks". These items were taken from Cox, Anderson, Reynolds, McKellar, Mela and Lean (1997). Following the presentation of the health message participants completed a set of efficacy and intention measures. Self-efficacy was measured from four items adapted from Fuchs, Leppin, Schwarzer and Wegner (1993), with responses given on a 4-point scale ranging from, "not true at all" to "exactly true". Response efficacy was measured using six items developed from the health message, for example, "eating five portions of fruit and vegetables a day will reduce my risk of heart disease and some cancers". Responses were measured on a 7-point scale, from strongly disagree to strongly agree. Intention to change were measured using two items adapted from Harris et al., (2007), "Do you intend to eat at least five portions of fruit and vegetables each day, in the next 7 days?" and "I intend to eat at least 5 portions of fruit and vegetables each day in the next 7 days?" Responses were measured on a 7-point scale strongly agree to strongly disagree. Participant's subsequent fruit and vegetable intake was recorded through a validated 7-day diary (Cox et al., 1997).

The results of this study showed randomisation to condition had been successful with no significant differences in the participant's baseline fruit and vegetable consumption or their stage of readiness to change. Complete diary data was available for 87 of the participants (46 affirmed and 41 non-affirmed). An ANCOVA for mixed designs with condition as the between subjects variable and day as the within subjects variable (seven levels) and baseline consumption as the co-variate, revealed a significant main effect of condition on mean fruit and vegetable consumption over the seven days ($p = 0.016$). Self-affirmed participants reported consuming significantly more fruit and vegetables over this period than their non-affirmed counterparts. There was no significant interaction with day showing that the effect was consistent over the seven days. One-way between participants ANOVAs were used to test for effects of condition on any of the other dependent

variables. Participants, who had self-affirmed, reported significantly higher self-efficacy and significantly higher response efficacy, than participants in the control group. Using the procedures described in Preacher and Hayes (2007) mediation analysis revealed the paths from condition to self-efficacy and response efficacy were significant. Response efficacy, but not self-efficacy, had a direct effect on post-manipulation fruit and vegetable intake. The significant effect of manipulation on post-manipulation fruit and vegetable consumption was reduced to non-significance when self- and response efficacies were controlled for, which indicates mediation. Bootstrapping procedures showed the total mediated effect of condition on post-manipulation consumption was significant. Through an examination of the individual variables, Epton and Harris (2008) report response efficacy mediated the relationship between condition and post-manipulation fruit and vegetable intake, however self-efficacy did not.

In discussing their findings Epton and Harris (2008, p.750) suggest through highlighting aspects of response efficacy in their health message, self-affirmation promoted 'wholehearted acceptance of the benefits of fruit and vegetable consumption on reading the message and this, in turn, encouraged the participants to eat more.' They go on to highlight the importance of targeting these aspects of persuasive messages in order to facilitate the effect of self-affirmation on post-manipulation behaviour. They explain that whilst self-efficacy ratings were higher in affirmed participants than in non-affirmed, self-efficacy did not mediate the effect of self-affirmation on subsequent behaviour. They suggest this may be reflective of the emphasis on response efficacy in the message, but also point out it may be a result of ceiling affects as scores on both groups for self-efficacy were close to the maxiMother of four. It may also be that fruit and vegetable consumption for this group of participants (undergraduate students) is not a behaviour that they believe is difficult to carry out. The same results may not be replicated in participants who feel there are barriers inhibiting their ability to carry out such behaviours. Epton and Harris (2008) see their findings as supporting the notion that self-affirmed participants processed the health information in a more systematic and less biased manner. They suggest whilst the evidence shows self-affirmation has the potential to lead to behavioural change but highlight that this process requires that the health message address key predictors of behaviour and is persuasive.

Whilst there are some limitations of this study, such as issues with self-report measures and the potential participants identified the series of studies were actually connected. Epton and Harris (2008) play down these limitations however stating there is much evidence for the success of previous two or multiple study paradigms (Harris et al, 2007; Harris and Napper, 2005). Furthermore the self-report method they used had been previously validated. The authors conclude by saying that future research should extend the range of behaviours tested in particular behaviours that promote health such as diet and physical activity. It will be a primary aim of this thesis to replicate these findings, and show that self-affirmation can impact post-manipulation behaviour.

2.7 Chapter summary

This chapter has explained why individuals may process a health risk message in a biased manner, and why this reduces their likelihood of making changes to their behaviour in order to reduce their susceptibility to the risk. It has described a technique, self-affirmation, which appears to reduce this biased processing so the risk identified in the message is more likely to be accepted. It highlighted the importance of presenting a message that is personally relevant. This chapter has also highlighted the effects of self-affirmation may be most prominent in individuals whose baseline behaviour puts them most at risk. Furthermore this chapter detailed a recent study (Epton & Harris, 2008) showing self-affirming prior to receiving a health message about the benefits of fruit and vegetable consumption, resulted in higher consumption over the following 7 days.

Chapter 1 considered attempts to utilise the Internet as a mode to deliver health related interventions. The benefit of this type of intervention is that it cost effective and does not require a long-term commitment from users. The premise being that simply reading the information will prompt a change in behaviour. However, chapter 1 also identified whilst presenting individuals with information about a health-behaviour risk was the most common way of intervening online, it was not a technique that had proved to be particularly successful. This maybe, as identified in

chapter 1, that the message did not have sufficient relevance for target audience but it may also be a result of biased processing as identified in this chapter.

Chapter 3: Barriers to healthy lifestyles for parents with low SES (study 1)

This chapter describes the first study in this thesis. Interviews with low SES parents living in the North East of England are used to explore the day-to-day lives of this group of parents with a particular focus on diet and physical activity behaviours in family life. In addition the interviews explore the current technology use of these individuals to investigate whether technological or Internet based interventions are a suitable means to intervene with this group. A particular focus is placed on barriers that this group identify in their pursuit of a healthy lifestyle and potential strategies they articulate to overcome these barriers.

3.1 Rationale

Chapters 1 and 2 highlighted the importance of considering the understandings, beliefs and experiences of the target population when developing a health message for an intervention. Interviews with low-SES parents allowed a better understanding of how aspects of diet and physical activity impact on family life. The study reported in this chapter sought to identify the barriers these parents feel exist in their pursuit of a healthy lifestyle. Understanding what barriers low-SES parents face helps to address the recommendations and advice given in the online health message. In addition as technology is to be considered as a potential means to deliver lifestyle interventions the interviews should attempt to address current technology usage within the family. This may help to give some anecdotal information about the suitability of an Internet based intervention for this group.

The research aims of this study were:
1. To explore participants' day to day lives in relation to; diet, exercise and technology to create a picture of how these elements are incorporated into the participants' daily routines.

2. To explore the participants' knowledge about the role of diet and exercise in their families' general health with a particular focus on the barriers that these parents identify in adopting health lifestyles choices for themselves and their families.

3.2 Ethics

All five studies reported in this thesis (in chapters 3 – 6 & 8) adhered to Northumbria University ethics guidelines. All studies were submitted to, and passed by the university ethics committee. Wherever possible, participants were given a hard-copy information sheet, consent form, and debrief sheet for each study, where these studies were completed online this information was provided electronically.

3.3 Method

3.3.1 Approach

In order to address the gaps in current literature it was decided this research should focus on identifying themes within the understandings of the target population. This would provide the scope for further investigation of the subject in question. It was therefore decided that the most appropriate method of analysis would be a thematic analysis. It was of upmost importance to the authors in this current study to employ a clear, replicable, and transparent methodology. Braun and Clarke (2006) outline a series of phases through which researchers must pass in order to produce a thematic analysis. This procedure allows a clear demarcation of thematic analysis, providing researchers with a well-defined explanation of what it is and how it is carried out whilst maintaining the "flexibility" tied to its epistemological position. In accordance with Braun and Clarke's (2006 recommendations, semi-structured interviews were employed to collect the data from the participants.

3.3.2 Participants

Participants were recruited through Sunderland Children's Centres and purposefully sampled as being parents of at least two children aged between 5 and 16 years. The parents mean age was 31.8 years (SD 6.3 years). They were assessed as being of low SES by their occupation and area of residence using the English Indices of Deprivation (Office of the Deputy Prime Minister, 2004). Furthermore the mothers who participated in the study were not employed and classified themselves as stay at home mothers. They were however, all taking part in training courses designed to

help them back to work. This meant for four days a week they were out of the house during school hours on the course at their local Children's Centre within their local primary school. The fathers on the other hand, were all in work (3 manual one as an IT technician) one of whom worked night shift, the others working more typical day shifts. An example of a participant information sheet can be found in Appendix 10.1.

3.3.3 Materials

An MP3 audio recorder was used to record the interview and an interview guide was developed in order to help focus the discussion (see Appendix 10.2 for the full interview schedule). The interview guide was developed through discussion with colleagues, and was piloted with 2 members of the target audience. Small revisions were made to aid the clarity of the questions.

3.3.3 Procedure

The interviews took place at a community centre in Sunderland whilst the parents were attending sessions provided by Sunderland Children's Centres. On arrival, the researcher introduced herself and provided name badges for the participants. The researcher briefly explained to the participants that she was there to talk to them about diet and exercise. The researcher also explained to the participants that they were not being tested, and she was only interested in hearing what they had to say, not whether they were right or wrong. Verbal instructions were provided to the participants and they provided verbal consent prior to the recording commencing. A series of questions were developed by the research team, these were designed to keep the focus group sessions on track whilst exploring issues relevant to the research question. The interview guide was centred on three keys areas, namely the discussion of day-to-day routines; healthy lifestyles (in particular physical activity and diet) and current technology use of the family. At the end of each session the researcher read out the participant debrief and provided each participant a debrief information sheet to take home. The data was transcribed verbatim (an example transcript can be found in Appendix 10.3) and analysed following the principles of thematic analysis (Braun and Clarke, 2006) as described in the following section.

3.3.4 Analysis Strategy

The data collected from the interviews was transcribed verbatim, during this process the initial thoughts and ideas were noted down as this is considered an essential stage in analysis (Riessman, 1993). The transcribed data was then read and re-read several times and, in addition, the recordings were listened to several times to ensure the accuracy of the transcription. This process of repeated reading (Braun & Clarke, 2006) and the use of the recordings to listen to the data help to ensure closeness with the data. Following on from this initial stage is the coding phase which builds on the notes and ideas generated through transcription and data immersion. Codes are identified features of the data that are pertinent to the research question. Equal attention was given to the whole data set so that full consideration could be given to repeated patterns within the data. The third stage involved searching for themes, themes explain larger sections of the data by combining different codes that may have been very similar or considered comparable aspects within the data. All initial codes relevant to the research question were incorporated into a theme. The development of thematic maps helped the researchers to visualise and consider the links and relationships between themes. At this point any themes that did not have enough data to support them or were too diverse were discarded. The refinement of the themes ensured they formed a coherent pattern, and where appropriate when considered in relation to the data set as a whole (Braun & Clarke, 2006). Phase five involved defining and naming the themes, considerations were made not only of the story told within individual themes but how these related to the overall story that was evident within the data. The final stage or the report production involved choosing examples from the transcript to illustrate key elements of the themes. Due to the nature of the research questions the results are presented as a description of the participants day to day lives and then the common themes in the barriers identified by the participants.

3.4 Results

Eight Participants (4 male, 4 female n=8) took part in this study to explore their day-to-day lives in relation to; diet, exercise and technology. Findings would help create a picture of how these elements are incorporated into the participants' daily routines.

In addition it was important to explore the participants' knowledge about the role of diet and exercise in their families' general health. Of particular importance was a focus on the barriers that these parents identified in adopting health lifestyles choices for themselves and their families.

It was apparent during the course of both the interview and the analysis process that the differences in the daily routines of the parents meant that mothers and fathers focussed on different areas during the discussion. For example, mothers reported having more involvement in the diet and the physical activities the children took part in on a daily basis. Due to the importance of the parents' daily routines in determining their relevant experiences an overview of their routines and their current technology use is presented prior to the emergent themes. The results are presented as common themes however the differences evident between the mothers and fathers are highlighted throughout.

3.4.1 Daily routines- Mothers

The daily lives of all the mothers were relatively similar; they involved getting up getting children ready for school, and preparing breakfast. One of the mothers prepared packed lunches for her children whilst the others' children had school dinners. The mothers then all walked to school with their children, the lengths of this walk to school varied from a few hundred metres to 'about a mile and a half'. An interesting observation from the data was that when asked about what exercise the mothers did they all stated 'walking' their children to school. However, they said they walked to school either because they didn't have a car themselves or that they couldn't drive, not because it was a good way of getting some exercise.

The mothers would then spend most of the day at the Children's Centre breaking for lunch, on the day this interview took place they had had 'fish and chips' or 'battered sausage and chips'. When asked if this was what they had most days three of them responded and suggested that it 'was normally something from a take away'. The mother who made packed lunches for her children however said she usually made one for herself but as she had known it was fish and chip day she'd thought she'd 'treat herself'. This is interesting as it provides an insight into the diets of the

participants and thus an insight into their current lifestyle. It is important to highlight that all of the mothers made a comment to the effect that they knew it wasn't 'healthy'. However they all said they didn't have time in the morning to make anything and there was nowhere in close proximity to the school where they could get anything healthy. This has two main implications for this thesis, the mothers: time, is an obstacle, and recommendations in the message need to provide methods to counter this. However if their lack of transport and busy schedules mean that travelling anywhere too far is an issue it supports the need for health advice to encourages strategies that can be implemented in the home or the immediate surrounding area.

For all the mothers participating, their evenings followed very similar routines. Typically evenings were spent feeding children, which for some of the mothers was a very trying procedure. One of the mothers claimed she had to prepare a separate meal for each of her children going as far as to say that the only way to get her son to eat any vegetables was to 'get those potato smiley face things that have got hidden bits of carrot in them'. However this mother's behaviour was contrasted by the opinions of others who felt that mothers who didn't stand their ground and gave into their children's demands regarding food 'only had themselves to blame' if they had fussy eaters for children. Although, all of the mothers concurred getting their children to eat certain foods particularly vegetables could be 'more of a struggle than it's worth'. This had a subsequent impact on all of the families eating habits as the mothers acknowledged they tended to prepare meals that were popular with the majority of family members, rather than encouraging or 'battling' with their children to try new things. Typical meals were described as traditional British food; 'pie and mash'; 'egg and chips'; 'shepherd's pie'.

3.4.2 Daily routines- Fathers

All of the fathers worked full time in manual jobs, with the exception of one who was an IT technician (low-skilled), with three working typical office hours, and one who worked night shifts. They all left the house early in the morning before their children went to school, with the exception of the father who worked night shift. He returned from work during his children's breakfast time and then walked them to

school before returning home. All four fathers however felt that they had 'very little control during the week' over what and when their children ate. Although it was typical of these fathers' families to all try to eat a meal together in the evening they often didn't return home from work until it had already been prepared, and on occasion their children had already eaten by the time the fathers had got back from work. They described these week night meals as often being something that was 'quick and easy' to prepare, they felt that time was often the biggest factor in deciding what to feed the family, as their partners needed things that were easy to do 'whilst watching young children'.

Furthermore they also felt at times it was easier to give in to the demands of children saying ' you know I don't get to spend loads of time with my kids- I don't want to spend that time battling with them about what to eat'. It is interesting that the fathers identified the weekends as being an opportunity to break from the typical weekly routine. 'It's only really at the weekend when we have proper meals together, that we've cooked together as well'. This may be an important consideration to make when considering the development of health messages. It also suggests that whilst fathers do play a role in making decisions about the family diet, it is second to that of mothers in this particular sample. This may provide motivation for this thesis to focus on mothers and their behaviour as they appear to be the primary care giver and decision maker in the areas relevant to this thesis.

3.4.3 Technology use

A particularly relevant aspect of the discussion focused on the current technology use of the parents, this was brought up by the mothers through a discussion of their families after school routines. It is important for this thesis to establish that the parents are familiar with, and use technology, to assess if an intervention delivered via technology is suitable for the target population within this thesis. Across the board the mothers responses suggested that the vast majority of their and their families evening activities included the use of some sort of technological device. Primarily this was the television, used both to watch television programmes and to play computer games but technology use also extended to gaming on mobile phones and the use of the Internet. The mothers explained they often relied on technological

devices to entertain their children; the main motivation for this was they questioned their children's safety when playing outside. The discussion with the fathers around technology use brought up some different issues from those raised by the mothers. Primarily the fathers felt particularly strongly about the importance of ICT skills with one father (the IT technician) saying 'IT skills are as important as reading, writing and maths.' It was evident the fathers believed that without the opportunity to develop these skills their children would be disadvantaged in later life. However it was particularly interesting that mothers identified potential dangers with playing outside, the father identified the dangers of their children being 'online'- 'I am concerned about my children playing online computer games, it's important to have strong parental controls'. This suggests it is important to consider the suitability of targeting an online intervention solely at children probably wouldn't be appropriate and thus it needs to be aimed at either the whole family or potentially just parents. As with the mothers the fathers listed similar forms of technology currently used in the home, television, computer gaming, Internet and e-mail and mobile phones, which two of the fathers described as 'practically computers now-a-days'.

Of particular interest with regards to this was the mothers current use of games that they downloaded to their mobile phones, or played via social networking sites such as; 'Facebook, I'm always playing Farmville or bejewelled on Facebook'. The awareness of the mothers that their reliance on indoor gaming equipment to entertain their children was having an impact on their children's motivation and potentially physical health is noteworthy. It highlights the fact that the parents do understand that they may not be making the healthiest choices for themselves and their children, but they feel unsure as to how they can do things differently. Furthermore 3 of the 4 mothers reported using the Internet to search for health advice although this was typically to look for recipes for healthy meals or activities they could do with their children. They felt that much of the information available told them things they already knew such as what the recommendations were for fruit and vegetable intake and amount of physical activity they should partake in. What they felt was lacking was 'how to' advice that would help them put recommendations into action. They reported the use of dieting websites and they tended to use such sites as 'cookbooks' as they didn't really have many or any of these at home. They felt they sometimes needed inspiration or ideas when it came to making something for dinner. However

none of them said they did this on a regular basis and it was usually when they hadn't planned and shopped for a particular dish but were 'trying to use up what was in the fridge'.

As with the evidence from the mothers it is encouraging that the current daily routines of these families already involves the use of various forms of technology, familiarity with such devices would suggest that families are unlikely to be fazed by an technological intervention. This is a promising finding and suggests that the Internet may be a means of disseminating health advice to this group. However messages delivered will have to be carefully considered in order to target the specific barriers that this group has highlighted such as time, money and local environment.

3.4.3 Themes

The details of the participants' daily routines above highlight some of the key barriers identified by the parents in relation to leading a healthy lifestyle. These themes, presented below, standalone from the description of the parents day to day lives as they describe barriers that the parents perceive in adopting or following health diet and exercise practises.

3.4.3.1 Confusion about health messages

All of the mothers said they did try to include the five portions of fruit and veg a day that their children were supposed to be getting, however there was clearly confusion about what actually constituted a portion.

> *"How am I supposed to know what a portion is? What's a portion for me isn't the same as for my kids-you know they've got to have child portions"*
>
> *(Mother)*

There is much evidence that many individuals struggle with understanding what a portion is. It is apparent that advice needs to be much clearer and disseminated in terms that everyone can understand.

> *"Like I know it's supposed to be 80grams,*
> *but what does that mean how do I know*
> *what 80grams looks like, they can't expect*
> *me to weigh out everything can they?"*

<div align="right">

(Mother)

</div>

Furthermore, behaviours discussed by the parents' demonstrated misconceptions that they have about what constitutes a healthy meal. These came to light when discussing problems associated with eating out as a family. The fathers felt that eating out with children was difficult

> *"....you need places that are kid friendly*
> *and do kid portions-normally that's fast*
> *food places, they are where the kids want to*
> *go…. But we try and compromise if we have*
> *fast food it's always like fried chicken, so*
> *it's not so bad- at least it's like real chicken*
> *breast!"*

<div align="right">

(Father)

</div>

This however suggests a possible misconception in the fathers understanding about what is healthy, and doesn't suggest that ensuring they and their families consume a suitable amount of fruit and vegetables or unprocessed food is as important as trying to please the whole family when it comes to eating out. Furthermore only one of the mothers was aware that frozen and canned fruits and vegetables counted towards their '5-a-day'. It was felt however that tinned and canned products were inferior to fresh and in fact that they should be aiming for premium products if they want to make the healthiest choices for themselves and their families.

> *"Well you're supposed to have fresh, organic*
> *fruits and vegetables aren't you, to count as*
> *your 5 a day, but I just can't afford to buy*
> *those……I get mostly frozen veg and some*
> *tinned stuff as well, I try to buy fresh fruit though."*

<div align="right">

(Mother)

</div>

This notion that money is an issue for the parents wanting to make healthy choices is discussed in more detail in the subsequent theme presented below.

3.4.3.2 Cost

The parents highlighted there were financial considerations to be made when shopping and planning meals and that they often found it too expensive to buy fresh fruit and vegetables.

> *"well they always seem to have gone off*
> *before you use them, you know*
> *because you've got to buy the big value*
> *packs and you just can't use them all up*
> *before they go bad."*
>
> *(Mother)*

There was some discussion that followed around ways to prolong the shelf life of fruits and vegetables such as cooking them and freezing them or using them as snacks throughout the day. However the mothers felt that whilst these where in theory good ideas in practise there often wasn't time or opportunity to do such things. Furthermore the parents talked about the availability of special offers, stating that they often felt inclined to purchase items that were on sale at discounted prices so that they could get more for their money. They were also aware that, typically, specials offers were available on less healthy food items but were often swayed on budget considerations as opposed to health considerations.

> *"I quite often buy things when they are*
> *on offer, but you never really find healthy*
> *foods on special offer. If you do it's*
> *always on things like fruit and vegetables*
> *that it don't really make sense to buy in*
> *bulk cos like I said before, they go off before*
> *they are eaten."*
>
> *(Mother)*

The issue of finance came up again when discussing the ease of being physically active, with fathers also pointing out that it can be an expensive business. They go beyond just highlighting the specific costs of the activity but also highlight the additional costs associated with taking part in sport.

> *"It's not just the membership fees you know,*
> *there's the kit and the transport and the time…"*
>
> *(Father)*

As highlighted here, a further issue that the parents highlighted was time, in terms of having the opportunity to be healthy.

3.4.3.3 Time

For all parents, time was reported as an issue they had in maintaining, or following a healthy lifestyle. Time became a particular issue when the parents discussed trying to fit physical activity into their own and their families' daily routines.

> *"I mean, I know it's not like I go out to*
> *work, but having four kids is like a full*
> *time job, I don't have time to take them*
> *to loads of different activities…..*
> *especially as I don't drive, public transport*
> *makes it impossible, it takes too long."*
>
> *(Mother)*

The mothers also highlighted time as a consideration when it came to preparing family dinners. They felt that cooking food from scratch took up too much time, and that although they did it when they could they predominantly cooked dinners that required minimal effort so that they could be around to supervise their children.

> *"I do try to cook, like I always do a*
> *Sunday dinner. It's just I get too flustered*
> *with the kids running around under my feet.*
> *I just don't have the time, I need to be*
> *watching what they are doing, or doing other*
> *things in the house, not slaving over a hot*
> *stove."*
>
> *(Mother)*

Time also was an issue when it came to the parents own behaviours, all of them cited time as a factor preventing them from engaging in regular physical activity. All of the fathers for example said that before they had had families they had been a lot more involved in sport and exercise.

"I was really active when I was younger,
I played football a few times a week, and I
used to go to the gym. Now I really struggle
to fit it in. I miss it, but that's life"

(Father)

The evidence here suggests that parents may benefit from the development of some time management skills, or more practically some help with cooking healthy quick and easy family meals. This would be an interesting aspect to try and incorporate into health messages, as it is essential that families address both diet and exercise in order to improve their health. Interestingly, there was an awareness that being physically active didn't necessarily mean taking the time out go to a class or training session and that it was something, at least in the case of their children that could be fitted into their daily lives. What is more they also pointed out that this needn't incur any costs if their children could run around and play outside but the parents pointed out a further barrier that made it difficult to do this, this is discussed in the following theme.

3.4.3.4 Unsafe local environments

The mothers reported they did try to encourage their children to play outside. They were also quite quick to point out that this is what they had done themselves when they had been children. However, the mothers felt that they didn't want to let their children play outside when the days get shorter.

"There are too many accidents on dark nights,
and our street is just so busy, too many cars
and it's not like I've got a garden or anything."

(Mother)

Other reasons given were that they couldn't watch over their children while they were outside, or at least not all of them. If they kept their children in the house they had a better idea of what they were getting up to.

"It's just not that safe around here and I
want to keep an eye on them, I can't do that
if they are off running around outside, I need
to be in with the little ones

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One mother even went as far to say that there were issues with the immediate environment. Something they blamed specifically on living in an area with a lot of social housing.

> *"There are too many paedophiles around here, because it's all council housing and that, it's where they put all the paedophiles and sex offenders, there's like 3 living in the streets around mine."*
>
> *(Mother)*

It is also important to mention that all the mothers were aware there was a downside to this and acknowledged this meant they had quite inactive children. They described the situation as difficult because they don't want their children playing on the streets, but keeping them inside meant that they lacked motivation for anything other than playing computer games. In turn, this then made motivating them to do organised activities, where they felt their children were safe, but which they struggled to afford both financially and in terms of time, much more difficult.

> *"It's catch 22, you want them to play and be active, but more than anything you want them to be safe. It's easiest just to let them play on the Playstation and that, but then I can't get them motivated when I do have some cash to take them swimming or something."*
>
> *(Mother)*

A noticeable difference between the mothers and fathers was that the fathers seemed more comfortable with their children playing outside. It was interesting the fathers felt strongly the importance of participating in sport went beyond just physical health but that it also benefitted their and their child's all round health. It was evident however, this generally took place at the weekend when both parents were at home so that the children could be supervised properly.

> *"They need fresh air, don't they? I mean they should be outside running around. We try to do that at the weekends when both of us can be there to watch them……They need*

to be active it's good for them mentally as
well as physically."

<div align="right">*(Father)*</div>

Feelings of being unsafe in the local environment did not inhibit the parents' own physical activity and the majority comments that related to this were concerned with their children. However the parents did feel that they didn't have appropriate resources in their local environment for them to engage in sport. The parents reported that there wasn't anywhere for them to take part in low cost activities such as parks or open spaces, and when there were issues with safety were raised again.

"I mean it's not like you can really go for
a run round here is it! I'd go to the park
but you'd just end up stepping on needles
or treading in dog pooh"!

<div align="right">*(Mother)*</div>

Interestingly when it came to doing things as a family the mothers in particular went on to highlight some of their own issues that prevented them from fully engaging with being physically active.

3.4.3.5 Personal Barriers

It appears these financial and motivational barriers are exacerbated by the mothers' own concerns about getting involved themselves in exercise. They view organised exercise classes as a source of embarrassment.

"I'm just not that a keen to be seen in a
swimming costume or gym kit, I look
like a beached whale'.

<div align="right">*(Mother)*</div>

It's interesting to note, the mothers particularly, were aware of the effect their own issues had on the behaviour of their children, particularly their daughters. It was their daughters who they typically found more difficult to motivate to take part in exercise and they felt that they had possibly not always s the best examples for their daughters.

> *"You know, when I've tried to tell the girls
> they should do some exercise, they laughed
> and said, 'what, like you?'. It's the same
> thing with their eating, they say why should
> they eat properly when I don't!"*

<div align="right">(Mother)</div>

This point also highlights the final barrier that the parents identified when discussing the barriers they had to following healthy lifestyles. Dealing with all of the individual requirements that their children and families had when it came to food also highlighted further problems.

3.4.3.6 Fussy eaters

For a lot of the parents a key issue when it came to their family's diets was having to deal with trying to please everybody. Many of the mothers reported having picky eaters, which meant trying to cook one meal the whole family would eat almost impossible. This was closely linked with the notion of 'time' in so much as preparing food took more time than it really needed to because they had to prepare different dishes for different members of the family. The combination of having fussy eaters and a lack of time meant that in some cases the whole family's diet suffered as it was easier to prepare things that could be eaten by everybody regardless of how health they were.

> *"I have to make this for him, and she won't
> eat that. It's impossible to make one thing
> that they all like that is healthy. I just have
> to give in sometimes and try not to worry too
> much about how healthy something is. I
> just want to make sure they eat something "*

<div align="right">(Mother)</div>

Not everybody agreed that fussy eaters had to be a problem. Some of the parents also felt parents themselves were to blame for having children who were picky about what they would eat. It was also important to highlight that the parents were quick to

<div align="right">87</div>

exchange tips about getting their children to eat certain foods, in particular vegetables.

> *"It's your own fault they are picky, you*
> *shouldn't give into them. If they are hungry*
> *eventually they will eat it……have you not*
> *tried like blending vegetables into pasta sauces,*
> *or putting turnip in the mashed tatties?"*
>
> <div align="right">(Mother)</div>

These points, as with many of the themes presented, highlight that it doesn't appear that the parents are not aware of what they should be doing in terms of leading healthy lifestyles. However it seems clear that there are many barriers which are perceived by this group that make it difficult for them to put the advice into practice.

3.5 Discussion

The main findings of this study were that participants appeared to have an accurate knowledge relating to diet and physical activity and they were aware of many of the recommendations made by the government and its agencies in relation to these behaviours. However discussions focussing on the participants' day-to-day life revealed evidence that suggests their knowledge and behaviour did not match up. They were able to explain the barriers they felt existed to adopting healthier lifestyles stating 'confusion about health messages', 'time', 'cost', 'fussy eaters', 'personal barriers' and 'unsafe local environments' hindered their adherence to healthful behaviours. What is interesting is that these barriers affected the lifestyles of the children and also those of the parents as well. Furthermore the participants were aware of the importance of their children's health but moreover were conscious of their role as care givers in their children's lifestyles.

Wardle and Steptoe (2003) suggested that through understanding the experiences of low SES groups, and taking into account how their specific circumstances relate to their understandings of healthy living and impact their behaviour. The literature described in chapter 1 demonstrated previous research whilst sparse, had highlighted some potential barriers specific to low SES groups in their adoption of healthier lifestyles. Interestingly some of the findings from the previous literature are evident

in the data presented here. For example Gettleman and Wickleby (2000) identified the participants in their study, needed clarification around the mixed messages they received caused by health myths. The participants here also reported experiencing confusion around health messages and suggested that they required clarification around some aspects of their knowledge. This is an interesting finding however addressing misconceptions can be difficult given the range of sources from which individuals get their health information.

Andajani-Sutjahjo, et al., (2004) were able to identify some barriers that young women experienced when engaging in physical activity or eating a healthy diet such as cost, time and motivation. Whilst motivation was not expressed here as a theme, the participants did identify personal barriers such as an embarrassment about engaging in physical activity in public. This embarrassment could feasibly inhibit their motivation to take part in exercise. Cost and time were identified as barriers in this group of low SES parents as they were in Andajani-Sutjahjo et al. (2004). Whilst Andajani-Sutjahjo et al. (2004) explained that these barriers weren't specific to low-income women, this study was limited to low SES parents and therefore comparisons can't be drawn, however this will to some extent be addressed in the following study, described in chapter 4. However it can be argued that perceived barriers such as cost are likely to inhibit healthy behaviours more in groups where income is a very real issue.

The evidence from the parents interviewed here suggested that barriers that relate specifically to physical activity and healthy eating are, fussy eaters and unsafe local environments. These two barriers are probably quite specific to parents, particularly having to contend with children who are fussy eaters. It was interesting that some parents felt that this was a barrier that could be overcome by employing strategies such as hiding vegetables in food, although this wasn't consistent across all the parents. The parents also reported whilst this issue maybe related to their children, it had a knock on effect for the eating habits of the entire family, including themselves. This is important because recommendations need to consider eating is typically a family activity and through making recommendations to increase their children's fruit and vegetable consumption parents may also be able to increase their own consumption. The feeling that their local environment was unsafe inhibited the

physical activity of these parents' children. Furthermore there was some evidence that concerns about the local environment did hinder the parents engaging in some forms of exercise.

This study also sought to understand the role of technology in family life, and its potential role in healthy lifestyles and in day-to-day family. It doesn't appear that previous research has considered the role of technology in this context however it was apparent that most activities within the family home required the use of some sort of technology. This included the television, games consoles, computers and the Internet. Interestingly even though not all of the participants had "always on" broadband they all had internet enabled mobile devices or used pay as you go mobile internet on their home computers and laptops. This supported the notion that the Internet may prove to be a viable means of disseminating interventions, suggesting that the digital divide may not be an insurmountable barrier and Internet based intervention may prove to be an effective means of accessing this group.

It is important to highlight that the small sample size recruited to take part in this preliminary study may have limited the conclusions that can be drawn. Due to time restrictions the recruitment of participants was limited and this may have prevented data saturation from being achieved.

3.6 Chapter summary

This chapter described a qualitative study designed to explore the day-to-day lives of low SES parents living in the North East of England. There was a particular focus placed on identifying barriers that these parents experienced in their adoption of healthy lifestyle behaviours both for themselves and their children. The barriers that were identified were, 'time', 'cost', 'unsafe local environments', 'personal barriers' and 'confusion about health messages'. Some of these findings were consistent with previous research, whilst others were particularly novel. It is interesting that whilst the interviews were not focussed on the behaviours of their children, the parents' responses were typically given in the context of their role as a parent. It appears that this role is an important part of their self-identity and suggests that to promote a personal relevance in a health message highlighting the information as being directed

at parents could help them to identify with the information in the message. This has implications for self-affirmation as a behaviour change technique as previous research into self-affirmation (Napper et al, 2005: Van Koningsbruggen and Das, 2009) has posited that health messages must be personally relevant in order for self-affirmation manipulations to be successful.

The following chapter describes a study that examines how the barriers and experiences identified in this study are reflected in different groups of parents from divergent socio-economic backgrounds. Previous research, (Andajani-Sutjahjo et al., 2004) identified barriers such as 'cost ' and 'time' were experienced by parents across socio-economic boundaries. This study will help to identify those that are particularly salient for low SES parents but may also identify how different groups approach and deal with barriers to healthy lifestyle. How the findings described here contributed to the development of the intervention will be described in chapter 7. Taking this is into consideration, this thesis proposes self-affirmation may prove to be a viable technique to increase the acceptance of a health message, presented via a website, resulting in a change in subsequent behaviour. It also proposes that in order to develop a health message promoting response and self-efficacy, the views of the target audience need to be considered so that behavioural recommendations are appropriate. Furthermore, this thesis aims to ensure the website presenting the message is viewed as credible, by considering the components of the website design and information that contribute to this.

Chapter 4: Exploring barriers to healthy lifestyles (study 2)

This chapter describes the second study in this thesis with the aim of further exploring the barriers identified in study 1. Q-methodology is used to explore the extent to which these barriers are unique to parents with low SES by including parents with non-low SES in the sample. Furthermore it was important to consider theses barriers in relation to each other to identify which barriers had the most salience with other parents with low SES. Q-methodology offers an innovative method to understand and explores people's attitudes and experiences as it facilitates the exploration of subtle differences that exist in individuals' beliefs. The findings of this study further inform the development of a health message that is personally relevant to the target audience.

4.1 Rationale

The interviews carried out in study one (detailed in chapter 3) identified some barriers participants perceived as hindering their adoption of healthier lifestyle behaviours. These barriers were 'cost', 'time', 'personal barriers', 'unsafe local environments' and 'fussy eaters'. The purpose of this study was to explore to what extent these same barriers and the wider experience of adopting a healthy lifestyle, are identified by other parents of low SES and those with higher SES. Previous research (Andajani-Sutjahjo et al., 2004) identified, mothers, regardless of their socio-economic status, experience barriers such as 'cost' and 'time'.

The research aims of this study were:

1. To explore in more detail the barriers to following a healthy lifestyle as perceived by parents
2. To verify the original interpretation of the interview data as some of the parents who originally took part in study one also participated in this study.

4.2 Method

4.2.1 Overview of Q-methodology

Q-methodology, (Stephenson, 1953) is concerned with subjectivity, and seeks to produce a representation of a person's point of view, on any issue that is personally and/or socially salient (McKeown & Thomas, 1988). It has been used successfully to examine a variety of social issues such as concepts of health and illness (Stainton-Rogers, 1991).

Q-methodology uncovers and identifies the range of opinions that exist about a specific topic under investigation. The methodology involves three key steps: initially a set of statements are developed, in this case they were generated from the interview data collected in Study 1 (see chapter 3); the second step requires participants to sort the statements across a Q-sort grid (see Figure 4.1); in the final step the data are analysed and interpreted.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5

Figure 4.1 The Q-Grid

The set of statements used in Q-methodology is known as a Q-sample. The aim when developing the Q-sample is to comprehensively represent the range of opinions, notions or beliefs that exist around a particular topic. This opinion data may come from focus group or interview data, as is the case in this study. It is also possible to gather statements from printed sources such as newspapers, magazines, journals or

other sources germane to the issue. This collection of items is called the concourse, and is used to develop the final set of statements to be used in the study.

From the concourse, a subset of statements is selected to form the Q-sample: this becomes the final group of statements to be rank-ordered by the test subjects. It is advisable the statements are of a similar length and attention should be paid to avoid ambiguity in the wording of the statements. The purpose of the Q- sample is to comprehensively capture a micro version of the macro concourse that exists around the topic under investigation, in this case potential barriers to practising a healthy lifestyle. To ensure content validity, sample statements are usually reviewed. In the case of this study, the Q-sample was reviewed by the research team (the author of this thesis and the supervisory team), this ensured the sample covered the range of opinions and experiences evident in the concourse. In addition, the research team considered and made modifications to the wording of the statements so participants who took part in study 1 were unlikely to be able to identify their own statements in the Q-sample. Study participants typically receive the set of opinion statements that have been randomly numbered (each printed on a separate card); a sheet with sorting instructions and an answer sheet; with a Q-grid, in this case the one represented in Figure 4.1, to record the chosen order of statements. The participants' personal opinion of the issue under investigation is operationalized, as data, through the individual's sorting of Q-sample statements. Participants are then asked to rank-order statements (agree to disagree) a process typically referred to as Q-sorting. Q-methodology uniquely assumes opinions are subjective and can be shared, measured, and compared. Rank ordering is used instead of asking participants to individually rate how much they agree or disagree with a statement as it attempts to capture the beliefs the participants have about the statements in relation to each other rather than in isolation. The Q-grid that is used in Q-methodology forces the participants to sort the statements into a quasi-normal distribution. The inverted pyramid shaped grid means there are fewer statements that can be placed at the extreme ends, representing strong feelings of agreement or disagreement and more that are allowed to go into the middle area. The middle represents what is often referred to as the "grey zone", meaning the participants feel a neutral or ambiguous reaction to the statement. Both the numbering of the statements and the symmetrical distribution across the grid facilitates the quantitative analysis of the data.

Q-methodology is unique in its approach, in that it contains both quantitative and qualitative aspects. Data is analysed through a variation of factor analysis. In normal factor analysis or "R method" correlations are identified between variables, however in Q correlations are looked for between subjects across a sample of variables. As Stenner, Dancey and Watts (2000, p.442) point out 'the strengths of Q lie in its exploratory and theory-generating potential'. The correlations revealed by the factor analysis provide the basis for the qualitative interpretation of the data. Exemplary sorts are produced that are representative of a shared belief or understanding across participants. The positioning of the statements across the grid is used to provide an interpretation of that understanding as a written account; this is the qualitative aspect of the analysis process. Subsequently Q studies do not typically involve the formulation of specific hypotheses although it is likely the initial generation of statements may have prompted the consideration of some existing shared understandings. It is not an aim of Q to (dis)prove a theory but to generate evidence that may lead to theory development.

Advocates of Q-methodology recommend researchers incorporate an additional qualitative element into their studies. This can take two forms; it is common practice to allow participants to provide either written or verbal feedback on their Q-sort in order to offer some additional explanation for their sorting of the statements (Stenner et al., 2000). This is useful information when interpreting the exemplary sorts and should be considered when constructing the written accounts of the factors. Additionally some researches also seek corroboration of their interpretation by providing participants who have loaded significantly on to an exemplary factor with a summary of the factor interpretation. They are invited to provide feedback on this interpretation, as to its accuracy. This again can provide a useful means of corroborating the factor interpretations. It is important to remind participants, and to keep in mind when considering the feedback, the summary is developed from an exemplary sort and thus will not be a precise interpretation of each individual participants' sort.

4.2.2 Participants

Thirty-five participants agreed to take part in this study. 15 Low SES participants were recruited (3 fathers and 9 mothers) as outlined in chapter 1 and as in study 1 (chapter 3), through Sunderland Children's Centres. In the majority of cases these participants completed the Q-sort whilst attending a session at the Children's Centre although in some cases the participants asked to take the Q-pack home and they returned their completed Q-sorts the following week. 20 Parents with non-low SES were recruited (6 fathers and 13 mothers) through opportunity sampling, once again their occupation and post-code were used to identify their socio-economic status. As many post-codes in the North East of England are categorised towards the most deprived end of the indices, participants were also sort from the South East of England where the majority of post-codes fall towards the least deprived end of the deprivation spectrum.

4.2.3 Materials

A pack was provided to participants containing study instructions (Appendix 10.4), a set of 66 laminated statements (Appendix 10.5) and a grid (Appendix 10.6) so they could record their sort.

4.2.4 Procedure

Participants were provided with the Q-sort pack that contained briefing and consent information. In some cases these were sent out by post, and participants were encouraged to complete them at home in their own time. After consenting to participate the instructions asked participants to familiarise themselves with the statements and to then sort the statements across the grid according to the study instructions. Participants are also asked to provide any comments they have about the statements or the sorting process, this is used to aid the interpretation of the exemplary sorts. Debriefing information was provided to participants after they had completed the Q-Sort. Participants then returned the packs by hand or post. Once the factor interpretations were complete participants who had loaded significantly onto exemplary sorts were sent a summary of the factor interpretation and asked to

comment on its accuracy. Eight participants responded to this request and their feedback is considered at the end of the results section.

4.3 Results

4.3.1 Statistical Analysis

31 participants (n=31) completed Q-Sorts, mean age 36.2 years (SD 7.4 years). The data for these participants were computer analysed with the aid of an established Q methodology package PCQ (Stricklin, 1987). In Q methodology it is the participants themselves that are inter-correlated, not traits or tests, as is the case in R methodology (Stainton Rogers, 1991). In Q, the initial inter-correlation matrix computed is that between each Q-sort with each other Q-sort, so in this case a 30 x 30 matrix. The resulting factor pattern matrix is varimax rotated and the correlation or loading of each Q-sort, or participant, is examined. Table 4.1 shows the initial factor extraction. It is only factors that have an eigenvalue greater than 1, have at least one Q-sort that loads on to it significantly at 0.45 (p=< 0.001) and over, a very 'stringent' significance level (Stenner et al., 2000), and is not confounded, by loading on to more than one factor that will be interpreted (Table 4.2 shows the participants factor loadings). Typically a factor will have a number of sorts that load significantly onto the factor. However for ease of interpretation, a single 'exemplary' Q-sort is produced by merging, through a procedure of weighted averaging, the Q-sorts of all the significantly loading participants (Brown, 1980).

Table 4.1 Initial Factors identified through analysis

Factor	A	B	C	D	E	F	G	H	I	Totals
Eigen	3.38	2.81	3.20	0.85	2.16	3.62	1.38	1.19	0.31	18.91
Variance	11%	9%	10%	3%	7%	12%	4%	4%	1%	61

Table 4.2 Participant loadings (correlations) onto the factors

	Factors								
Participant Number	A	B	C	D	E	F	G	H	I
NEF10AF	33	-20	8	18	-47*	17	25	-6	2
NEM1AF	23	-37	-18	8	-6	48*	24	-35	12

NEF11AF	18	-32	-11	-2	-51*	35	4	-32	24
NEM14AF	7	-30	-8	-4	-65*	13	1	-2	-13
NEM15AF	8	-1	-18	-14	-68*	10	13	-4	5
NEM18LSE	45*	-48*	-21	-9	-12	27	3	22	-10
NEM19LSE	50*	-34	-6	-23	-14	48*	18	-8	12
NEF1AF	45*	-28	-21	39	-26	23	10	-11	25
NEM5LSE	46*	-23	-16	-12	-11	58*	12	-7	-7
NEF4AF	54*	-7	22	-1	-6	31	23	-33	5
NEF5LSE	9	-68*	-8	6	-24	21	8	-9	7
NEF6LSE	15	-70*	-10	10	-10	8	12	-12	0
NEM7AF	60*	-39	-3	-5	-22	27	0	7	6
NEM8AF	12	-28	-15	9	-13	28	59*	-7	0
NEM9AF	33	-9	-12	0	-29	14	48*	-14	5
NEF1LSE	11	-10	-93*	-3	-7	13	8	-6	1
NEF2LSE	11	-6	-88*	-6	-10	15	9	-6	-3
NEF3LSE	10	-12	-91*	4	-13	10	7	-4	2
NEF4LSE	25	-25	3	-9	-19	32	0	-25	0
NEF7AF	45*	-21	-26	-15	-10	23	25	-21	-15
NEF8LSE	4	-48*	-2	-26	-4	19	9	-6	-5
NEF10LSE	19	-6	-3	31	-26	14	21	-36	0
SEF1BF	65*	0	-6	-14	-7	1	18	-10	-3
SEF2BF	21	-33	-20	-14	-13	39	11	-49*	-7
SEF3BF	34	-14	-22	9	-21	61*	13	-14	-1
SEF4BF	0	-11	-5	0	-19	61*	11	-2	0
SEF5BF	9	-24	-11	-3	-10	49*	28	-32	17
SEF6BF	37	-14	-12	-4	-5	52*	43	-2	-16
SEF7BF	30	-30	-32	-13	-35	54*	11	-11	-2
SEF9BF	49*	-8	-26	9	-2	41	-10	-21	10
NEF10LSE	19	-4	-4	-47*	-11	6	-1	-2	1

Denotes loading greater or equal to 0.45

At this point, as Factor D and I have Eigen values less than 1 they are disregarded as factors worthy of interpretation. Furthermore Factor H had no loadings that meet the 0.45 level. In total 24 sorts are accounted for across 6 factors; A, B, C, E, F and G and 3 sorts were confounded meaning these participants loaded significantly onto more than one factor, in this case they all loaded significantly onto 2 factors, confounded sorts. The remaining sorts did not load significantly onto any of the

factors. Written accounts of the exemplary factors meeting the statistical requirements for interpretation are presented below.

4.3.2 Factor Interpretation

Interpretation is based on the factor arrays, although it is common practice to utilise the additional comments provided by participants to aid the interpretation or to allow expansion on certain notions evident across the factor arrays. Factor interpretation should be considered a hermeneutic process, which involves not just the reading of individual item rankings, but through considering the pattern of the Q-sort as a whole. It is essential to remember there is inevitably a subjective element involved in factor interpretation, however the aim is to create a reconstruction of the participants subjective beliefs represented in the original Q-sort. The interpretation of the factors is supported by identifying key statements and their positioning in the exemplary sort that justify the interpretation. In the factor interpretations presented below the numbers in brackets represent factor item rankings. For example (17: +5) indicates that item 17 is ranked in the +5 (most agree) position in the exemplary sort.

4.3.3 Factor A –*Healthy living is about fun and balance, and we are able to do that!*

```
-5   -4   -3   -2   -1    0    1    2    3    4    5
------------------------------------------------------
23    7    6    5    1    3   16    2   12   22   21
24   17   11   10    4   19   20   15   47   28   49
31   25   32   13    8   29   27   39   48   40   61
     41   45   26    9   33   44   50   57   65
          60   30   14   36   51   53   58
               34   18   42   54   59
               35   38   43   55   62
               37   46   52   56   66
                         63
                         64
```

Figure 4.2 Factor A exemplary sort

Sort with significant loadings:

Participant Number	Load
NEM7AF	0.45
SEF1BF	0.66
NEM1AF	0.45
NEF4AF	0.54

NEM7AF   0.60

SEF9BF   0.49

This factor (see Figure 4.2) represents an understanding that was shared by parents of non-low-SES across geographical locations both from North East and South East England. This exemplary sort demonstrates an understanding and viewpoint that shows a typically proactive view towards healthy living. There is a feeling amongst these parents that technology is a barrier to exercise (21: +5), and they appear unenthused by technology as a means of being physically active (5: -2, 52: 0). This is reiterated by concerns about online safety (49: +5) when it comes to their children. It seems probable given the positioning of some statements that these participants and their families don't engage heavily with gaming technologies in the home (9: -1, 17: -4, 64: 0). Interestingly they do think ICT skills for example are important and that some engagement with such technologies is necessary (48: +3).

The individuals represented by this Q-sort acknowledge the importance of being physically active (61: +5) and in addition take an active role in encouraging and supporting physical activity primarily for their children. The focus for these parents is on physical activity being fun (65: +4, 58: +3) and on setting a positive example for their children (40: +4). In addition these parents display an active role in facilitating their children being physically active outside of the house, something they feel their children enjoy doing (23: -5, 7: -4, 6: -3, 62: +2, 10: -2). Despite this they have some concerns about the safety of the local environment (22: +4, 66: +2), although they don't always let this become a barrier and their specific local environments facilitate this more than those of other participants (8: -1, 18: -1, 17: -4). In addition they represent a view that physical activities need to take their place alongside other activities the family engages in, which is representative of a balanced viewpoint towards their families overall well-being (47: +3, 57: +3, 53: +2). Interestingly despite this very conscious awareness of the importance of exercise for their children's health the parents' Q-sorts would suggest they sometimes find it difficult to incorporate exercise into their own daily lives (59: +2, 51: +1, 20: +1, 56: +1). However it would seem that in general they feel they set a positive example for their children to follow and are in a position to encourage healthy behaviours in their children. (30: -2, 25: -4, 43: 0).

This balanced view as to how physical activity should be fitted into the family's daily routines is also reflected in the participants' views relating to diet and specifically fruit and vegetable consumption. It has already been established that the parents represented in this Q-sort feel they have a responsibility to set an example to their children, but they feel this should be a balanced approach to healthy living (28: +4, 13: -2, 39: +2, 29: 0, 55: +1). In addition these parents feel equipped with the relevant knowledge that allow them to make informed and balanced decisions, the positioning of statements such as (29: 0, 34: -2, 35: -2, 27: +1, 32: -3, 38: -1, 4: -1, 31: -5) suggest that as these notions don't really form an integral part of their belief system tand thus the parents don't see them as pertinent issues effecting their behaviour (33: 0, 36: 0).

The parents do acknowledge there are some barriers such as money and time, which may cause a problem in following healthy lifestyles. It would seem they don't necessarily see these barriers applying to themselves (15: +2, 50: +2, 26: -2, 46: -1, 54: +1). A further point to make with regards to this factor, is it would appear these parents adopt healthy eating habits for their families with relative ease, this may be partly in relation to their children's' eating habits as they appear not to have children who are fussy or picky eaters (41: -4, 33: 0, 42: 0). This is important to bear in mind when this factor is considered in relation to the other factors.

4.3.2 Factor B- *It's not hard being healthy on a low income, you've just got to find a way you can afford!*

```
-5   -4   -3   -2   -1    0    1    2    3    4    5
-------------------------------------------------
40   25   28   16   13    5    3    2    1   17   15
62   33   42   47   31    8    4    6   14   21   23
65   53   48   52   35   20   11    7   18   26   51
     58   50   59   38   30   19    9   29   27
     57   60   41   32   22   10   45
          61   54   34   24   12
          64   55   36   44   39
          66   56   37   63   49
                    43
                    46
```

Figure 4.3 Factor B exemplary sort

Sort with significant loadings:
Participant Number   Load

NEF5LSE   -0.69

NEF6LSE   -0.71

NEF8LSE   -0.49

The sort below (Figure 4.4) is therefore representative of these participants who load negatively onto Factor B, the original Sort (see Figure 4.3) has been inverted.

```
-5   -4   -3   -2   -1    0    1    2    3    4    5
---------------------------------------------------
15   17    1    2    3    5   13   16   28   25   40
23   21   14    6    4    8   31   47   42   33   62
51   26   18    7   11   20   35   52   48   53   65
     27   29    9   19   30   38   59   50   58
          45   10   22   32   41   60   57
               12   24   34   54   61
               39   44   36   55   64
               49   63   37   56   66
                         43
                         46
```

Figure 4.4 Factor B exemplary sort (inverted)

This sort (see Figure 4.4) is representative of mothers with low SES, although none of these mothers took part in the original interviews. They come from a slightly different demographic than the parents who were interviewed in study 1 (chapter 3). It is still an area of low SES but being more rural they have more access to open spaces, something this Q-sort would suggest plays a role in their understandings.

The parents represented in this sort felt strongly it is their responsibility to set an example to their children. They encourage them to play outside and be physically active in a way that is fun, whilst also being willing to supervise their children when they play outside (40: +5, 62: +5, 65: +5, 58: +4, 53: +4, 23: -5, 53: +4, 10: -2). In this exemplary Q-sort the participants reject the notion that being on a low income can make it hard to be healthy (15: -5, 14: -3). This presents an interesting finding considering these parents have low SES. It suggests cost is not a considerable barrier to all low SES parents. It also suggests a different attitude towards their socio-

economic status. The positioning of other statements in the grid support the notion that financial considerations need to be made and may, at times, affect what the parents are able to do (4: -1, 54: +1). However despite this they are not particularly concerned about the financial costs as they prioritise their family's health (16: +2). This Q-sort suggests the mothers here are keen to engage in some physical activity but their current lifestyles may at times make it difficult for them to take the time to get involved in exercise (51: -5, 63: -1, 50: +3, 59: +2). Interestingly, despite the mothers being aware they may not always set the best examples they don't appear to let their own concerns inhibit them from engaging with physical activities with their children (26: -4, 47: +2).   It seems apparent for these mothers it is important their children engage in physical activity and they make an effort to facilitate their children taking part in physical activity (61: +2). What is more they feel their local environment facilitates them allowing their children play outside (7: -2, 22: -1, 8: 0), although, unsurprisingly, they do exert some caution about letting their children go too far on their own (66: +2).

The mothers here also appear to feel quite strongly that technology does not inhibit people from taking part in exercise (21: -4). In fact, the suggestion is they believe utilising gaming software could help them and their families engage with some exercise (64: +2, 52: +2), although they may not be currently using such technologies themselves (5: 0). They also don't feel technology demotivates their children from engaging in other activities (18: -3, 6: -2). Their comfort with technology is reiterated, as they do not appear to be overly concerned about online safety (49: -2). They also believe in the importance of developing their children's ICT skills (48: +3).

Interestingly in comparison to Factor A this exemplary Q-sort shows the mothers here do have some concerns about their own behaviour and the impact this has, specifically on their daughters' behaviour (25: +4). What is more the mothers here appear to exhibit some concerns about the health messages they receive (31: +1, 35: +1, 38: +1) although the positioning of these statements suggests they are mild concerns (32: 0).   There is also some confusion about what they should be doing, particularly when it comes to understanding what constitutes a portion (33: +4).

Despite these concerns there is strong evidence the mothers make well-informed, balanced choices for themselves and their families. They feel able to make healthy choices when it comes to their family's diet and they feel in control of what their children are eating (28: +3, 27: -4, 29: -3, 55: +1, 34: 0, 36: 0, 39: -2). This sense of control is reflected in their opinions about dealing with fussy eaters, something, which they feel, is a result of poor parenting (42: +3). There is a slight suggestion they themselves have to deal with their children being picky about what they eat but they employ strategies that allow them to get their children to eat the right things (41: +1, 3: -1).

4.3.3 Factor C – *Being on a low income makes it hard to be healthy, we do try, but it's hard!*

```
-5   -4   -3   -2   -1    0    1    2    3    4    5
---------------------------------------------------
 4   14    5   12    7    2    6   18    1    9    8
58   15   20   13   30   26   16   22    3   10   11
64   39   21   19   48   29   27   28   24   23   17
          65   40   32   52   42   35   31   25   45
               63   34   53   44   36   33   51
                    38   60   47   37   43
                    41   61   54   50   46
                    62   66   55   57   49
                              56
                              59
```
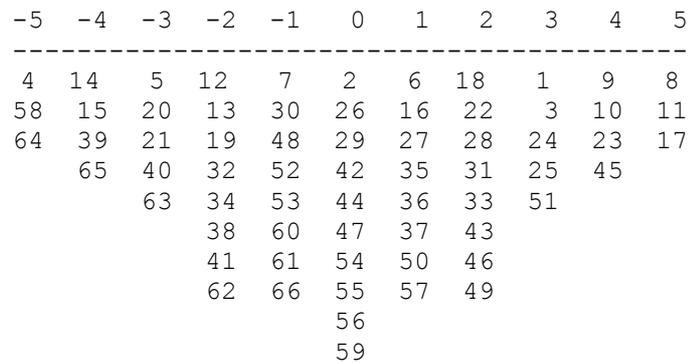
Figure 4.5 Factor C exemplary sort

Sort with significant loadings:

Participant Number   Load

NEF1LSE   -0.93

NEF2LSE   -0.89

NEF3LSE   -0.91

The sort below (Figure 4.6) is therefore representative of these participants who load negatively onto Factor C the original Sort (see Figure 4.5) has been inverted.

```
 -5   -4   -3   -2   -1    0    1    2    3    4    5
-------------------------------------------------------
  8    9    1   18    6    2    7   12    5   14    4
 11   10    3   22   16   26   30   13   20   15   58
 17   23   24   28   27   29   48   19   21   39   64
      45   25   31   35   42   52   32   40   65
      51   33   36   44   53   34   63
           43   37   47   60   38
           46   50   54   61   41
           49   57   55   66   62
                     56
                     59
```
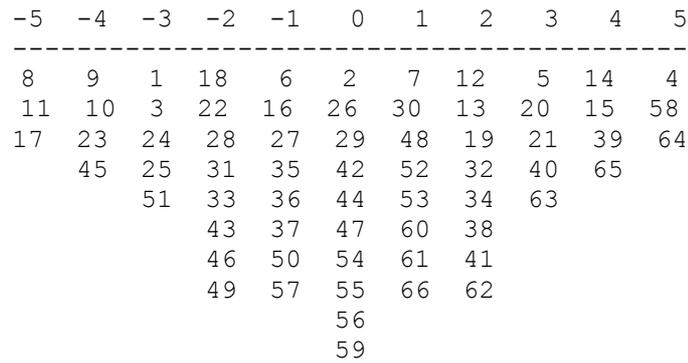
Figure 4.6 Factor C exemplary sort (inverted)

This exemplary Q-sort (see Figure 4.6) represents the understandings and experience of three mothers with Low SES. It is important to note these mothers also all took part in the interviews described in Study 1 (chapter 4) and thus helped to generate part of the concourse from which the statements were derived. This has important implications as it also allows an opportunity to validate some of the key themes that were identified in the initial analysis.

These mothers feel strongly that their economic status inhibits their ability to follow as healthy a lifestyle as they would like, both in relation to their ability to exercise and their accessibility to fresh fruit and vegetables (4: +5, 14: +4, 15: +4). However, they acknowledge that exercise can take place elsewhere and that by making it fun and incorporating it in with other family activities can make it easier to do (58: +5, 65: +4, 64: +3). One manner in which they attempt to incorporate exercise into their family time is to use technology that facilitates this (64: +5, 5: +3). However this is slightly contradicted by their belief technology does inhibit people from getting out of the house to exercise (21: +3). It is important to note this is further complicated by their feeling that exercising in the home eliminates embarrassment of exercising in public (20: +3, 19: +2). The mothers represented in this Q-sort believe technologies and in particular computer games are an important part of their children's lives (11: -5, 17: -5), despite their concerns that technology contributes to their children being less active outside of the house. They don't feel however, that their children are always playing on computer games, nor do they think their own children are particularly demotivated from being physically active by computer games and the television (6: -1, 18: -2). This may help to explain why their concern doesn't appear to heavily impact their behaviour (9: -4). Interestingly

it is a less strong belief of the mothers in this factor that ICT skills are important for their children to learn (48: +1) than it is to the mothers in the previous two factors. Furthermore they are also relatively unconcerned about issues with online safety (49: -2) when compared to the parents represented by other factors.

They reject the notion that they are not able to always supervise their children when they play outside or that other things get in the way of them supervising their children (10: -4, 23: -4) and they aren't concerned that the shorter days maybe more dangerous for their children to play outside (8: -5). Furthermore these mothers appear to place less importance on other aspects of the environment than participants in other factors have identified as larger barriers such as sex offenders (22: -2) or lack of suitable places for their children to play outside (66: +1, 7: +1). This is interesting because the original interview data suggested that for this group of participants in particular unsafe local environments inhibited their and their family's physical activity. What this suggests is that whilst they may have discussed this issue in the interviews, when positioned against other statements it appeared less important to them than other themes captured in the statements. Additionally concerns about sex offenders living in the local area, were only expressed by one mother in the interviews and therefore it is likely this was an issue specific to her.

It is noteworthy that the mothers represented by this Q-sort, whilst they still feel it is there responsibility to set an example to their children (40: +3) they have positioned this statement further away from the positive extreme than the parents in all the other factors. However they are not worried that their daughters may pick up on bad habits by copying their behaviours (25: -3). They also have concerns about the messages their children pick up concerning their health, in particular those surrounding obesity (39: +4, 12: +2). This is confounded by the confusion or scepticism these mothers feel around the messages they receive from a variety of sources (32: +2, 38: +2). However some of the aspects that cause confusion for some of the parents appear not to be a major issue in this factor, for example, the mothers do not find advertising misleading nor do they query what they believe a portion of fruit and vegetables to be (33: -2; 31: -2).

The mothers reveal some issues with their children being fussy eaters (34: +2) but demonstrate they have strategies in place to prevent this from becoming a major issue (41: +2), and do not view it as a particular difficulty they have with their children (3: -3). However they do believe to some extent it is important that their children eat something, regardless of how healthy it is, rather than nothing (13: +2).

4.3.4 Factor E –*We have a relaxed approach, we try to set a good example but you've got to have fun and treats too!*
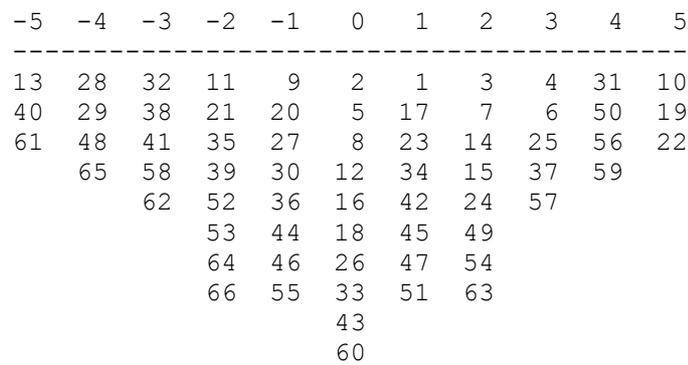
```
-5   -4   -3   -2   -1    0    1    2    3    4    5
---------------------------------------------------
13   28   32   11    9    2    1    3    4   31   10
40   29   38   21   20    5   17    7    6   50   19
61   48   41   35   27    8   23   14   25   56   22
     65   58   39   30   12   34   15   37   59
          62   52   36   16   42   24   57
                    53   44   18   45   49
                    64   46   26   47   54
                    66   55   33   51   63
                              43
                              60
```
Figure 4.7 Factor E exemplary sort

Sort with significant loadings:

Participant Number	Load
NEM14AF	-0.66
NEM15AF	-0.68
NEF10AF	-0.47
NEF11AF	-0.51

The sort below (Figure 4.8) is therefore representative of these participants who load negatively onto Factor E the original Sort (see Figure 4.7) has been inverted.

```
-5   -4   -3   -2   -1    0    1    2    3    4    5
-------------------------------------------------------
10   31    4    3    1    2    9   11   32   28   13
19   50    6    7   17    5   20   21   38   29   40
22   56   25   14   23    8   27   35   41   48   61
     59   37   15   34   12   30   39   58   65
          57   24   42   16   36   52   62
                    49   45   18   44   53
                    54   47   26   46   64
                    63   51   33   55   66
                              43
                              60
```

Figure 4.8 Factor E exemplary sort (inverted)

This exemplary sort (Figure 4.8) is representative of parents from a non-low SES background all living in the North East of England. This exemplary sort demonstrates that for these fathers it is a primary concern their children eat something regardless of how healthy it is (13: +5). Whilst they try not to buy food that would be considered unhealthy they do feel that treats are a necessary purchase (28: +4) and this is confounded as they feel it hard to resist supermarket special offers on unhealthy foods (29: +4). They recognise their responsibility to set an example for their children, as their children pick up on their behaviour (40: +5) and in addition feel strongly they should supervise their children wherever possible (10: -5). What is more they also feel sport needs to be made fun in order to encourage their children to participate (65: +4, 58: +3, 53: +2). It would also appear these parents are actively setting an example by finding time to participate in sport and exercise themselves (50: -4, 56: -4, 59: -4). Furthermore they believe sport and exercise has benefits for their children above and beyond the physical (61: +5), they also reject a notion that is felt more strongly by some of the mothers in other factors that exercise involves some sort of personal embarrassment (19: -5).

This factor reveals these parents do demonstrate some confusion or at least a feeling that they receive some mixed messages (32: +3, 35: +2, 39: +2). Whilst they don't find advertising, specifically, misleading (31: -4) they do find it contradictory that sometimes they are given health advice by individuals who aren't themselves necessarily practising what they preach (38: +3).

The fathers represented by this Q-sort do believe that ICT skills are an important and necessary part of their children's education (48: +4). However they are less

favourable when it comes to gaming technologies believing computer games are a waste of money that are only effective as short term entertainment for their children and they can inhibit physical activity (11: +2, 21: +2). This is reflected in a somewhat weak belief that their children are always playing on computer games (9: +1). Despite this they reveal their children would rather be outside playing than sitting in front of the television (6: -3). They do view exer-gaming technologies as a useful means of incorporating exercise into their family's daily lives (52: +2, 64: +2) and they have little concern about their children's safety when playing on-line games (49: -2). However, given the positioning of other statements, as already demonstrated, this is second to engaging in sport, exercise and physically active play outside of the home (62: +3). It would appear the parents do have some concerns about the immediate environment in that outside spaces are limited (66: +2). They don't seem to find this a huge barrier however as they do feel there is somewhere their children can play outside unsupervised (7: -2, 23: -1).

These parents don't seem to identify with some of the economic barriers experienced by the parents in other factors. They don't identify strongly with the belief that being on a low income makes it hard to be healthy (15: -2) and they don't appear to face some of the concerns felt by other parents about buying fresh fruit and vegetables (4: -3) or taking part in sport or exercise (14: -2, 54: -2).

4.3.5 Factor F- *We follow a healthy lifestyle by setting a good example, that's our responsibility!*

```
-5   -4   -3   -2   -1    0    1    2    3    4    5
---------------------------------------------
 3   10   13    8    2    1   23    5   39   28   29
 4   14   16    9   19    6   24   32   47   40   55
36   27   20   12   21    7   35   38   60   53   61
     30   43   17   22   11   41   42   63   64
          54   25   31   15   49   51   65
               26   33   18   50   56
               34   37   45   52   57
               44   66   46   62   59
                         48
                         58
```
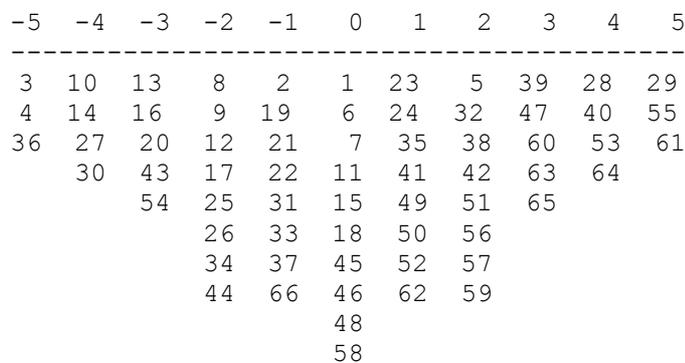
Figure 4.9 Factor F exemplary sort

Sort with significant loadings:

Participant Number	Load
SEF3BF	0.61
SEF4BF	0.61
SEF5BF	0.49
SEF6BF	0.52
SEF7BF	0.54
NEF1AF	0.48

This exemplary Q-sort (see Figure 4.9) is representative of mothers from non low-SES backgrounds. Five of the six mothers represented by this sort are from South East England and one is from the North East. The exemplary sort here reveals aspects about these parents' approach to their and their families' diets. Their children typically eat the same food as they do and these mothers believe this is important in encouraging their children to eat a balanced diet (55: +5, 44: -2). This pro-active attitude is reflected in their rejection of the notion that their children can't eat 5 potions of fruit and vegetables a day (36: -5, 34: -2) and that they feel there are no financial barriers hindering them from being able to buy and consume fresh fruit and vegetables. They also appear not to have to battle with children who are fussy eaters, or if they do have issues with their children being picky it is something they are capable of dealing with (3: -5, 24: +2, 41: +1). However these mothers also admit that sometimes supermarket special offers on unhealthy items are hard to resist (29: +5, 28: +4).

For these mothers exercise makes up a range of activities they engage in with their families. They believe strongly that sport is important for their children's physical and mental health and that making physical activity fun and part of other family activities facilitates its integration into the family routine (61: +5, 53: +4). To this end the mothers feel games consoles such as the Nintendo Wii© are useful (64: +4) however they also believe that physical activities need to be incorporated into family activities along with educational trips and other types of games (47: +3, 57: +2). The use of technologies in the home takes a less prominent place in this sort than it does in others. Whilst the mothers make reference to the use of exer-gaming equipment (as above) other statements expressing notions about the use technologies in the daily

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lives of these participants are seen as less relevant to their own experiences (52: +1, 6: 0, 11: 0, 18: 0, 48: 0).

It is very important for these mothers that they set a good example to their children in terms of living a healthy lifestyle (40: +4). They acknowledge that at times however their current lifestyles make it difficult for them to engage in physical activity (63: +3, 51: +2, 56: +2, 59: +2, 50: +1). Although it would appear they manage to remain relatively physically active (60: +3, 63: +3). However, these mothers seem to feel exercise can be a source of embarrassment for them, as was identified in some of the other factors (20: -3, 26: -2, 19: -1). They reject the notion expressed by other parents that exercising can be expensive (14: -4, 54: -3) although they do feel that cost needs to be a consideration when choosing which activities to do (16: -3). They also feel less concerned about their environment inhibiting their children being active out of the house (7: 0, 66: -1, 8: -2, 22: -1), this may help them in facilitating their children being active outside without out incurring financial costs.

These mothers acknowledge that there are some conflicting heath messages in circulation from a variety of sources (39: +3, 32: +2, 38: +2, 35: +1). However, it would appear they feel in control of their and their family's behaviour and able to make suitable judgements about this information (27: -4, 43, -3, 30: -4, 12: -2, 25: -2, 31: -1, 33: -1, 37: -1).

4.3.6 Factor G – *Healthy living isn't difficult, but it isn't the be all and end all!*

```
 -5   -4   -3   -2   -1    0    1    2    3    4    5
----------------------------------------------------
  4    9    4    5    1   20    2   27   16    6   40
 22   17   15   24    3   25   10   28   21   49   61
 29   23   37   39    7   30   11   32   41   55   62
      36   43   44   12   31   13   33   58   65
           60   46   19   35   14   34   59
                48   26   38   18   42
                52   50   45   47   53
                54   56   51   63   64
                          57
                          66
```

Figure 4.10 Factor G exemplary sort

Sort with significant loadings:

Participant Number   Load

NEM8AF   0.59

NEM9AF   0.48

This exemplary Q-sort (Figure 4.10) illustrates the beliefs and understandings of two North East fathers of non-low SES.   The fathers represented by this Q-sort believed it was their responsibility to set an example to their children (40: +5). They actively encourage their children to play outside (62: +5) and believe in the importance of taking part in sport for both their physical and mental wellbeing (61: +5). However, interestingly, they feel that their children would rather be inside watching television than playing outside (6: +4, 18: +1). This feeling is reiterated, as they believe that technology can be a barrier to getting out and exercising (21: +3). Interestingly, they don't feel their children spend all of their time playing on computer games (9: -4) and they don't appear to feel that in their family's case, buying computer games causes financial issues (17: -4). However there is a suggestion the fathers may not feel that computer games are money well spent (11: +1). The understanding represented here reflects a view on the importance of ICT skills unlike those across the other factors with the fathers feeling that they are not as important as the more traditional reading, writing and arithmetic (48: -2). In addition these fathers have strong concerns about their children's online safety (49: +4). These fathers also acknowledge that exer-gaming technologies such as the Wii© maybe a fun way of engaging in fun family activities (64: +2). They don't feel however, they help fit physical activity into a busy schedule, nor have they started using such technologies as an alternative to their children playing outside (5: -2).

Their keenness to support their children playing outside is probably facilitated by their immediate environment. They don't share the concerns expressed in some of the other factors about accidents when the days are shorter or paedophiles living in the area (8: -5, 22: -5). The positioning of statements about areas or spaces for their children to play in suggests these are not major concerns for these fathers (7: -1, 66: 0). Whilst it would appear at times it may not be possible for these fathers to supervise their children whilst playing (10: +1) they don't feel this prevents them

from supervising their children when needed or letting them out unsupervised when suitable (23: -4).

They don't believe that being on a low income makes it harder to be healthy (15: -3). This feeling is further reflected as they feel they are able to afford to buy fresh fruit and vegetables (4: -3) although they reveal that special offers on unhealthier foods can be hard to resist (29: -5). They strongly disagree that their children can't eat five portions of fruit and vegetables a day (36: -4). The fathers feel that it is important their children eat a balanced diet and encourage them to eat the same meals as they do (55: +4). However they do acknowledge that they employ strategies to get their children to eat sufficient vegetables, as they can be fussy (34: +2, 41: +3). Further more the fathers reveal that they believe to some extent that it is a parents fault if they have children who are picky eaters and that parents should stand their ground and not give into their children's demands (42: +2). Whilst the fathers seem to feel they are in control of their children's diets (43: -3) they don't feel they can always stop their children from helping themselves to food in the kitchen (27: +2) and acknowledge that they do keep treats in the house (28: +2).

The fathers represented in this exemplary Q-sorts feel they sometimes struggle themselves to stick at exercise as they get bored easily (59: +3) and they don't have particularly physical jobs that allow them to keep fit (60: -3). They don't feel the cost of exercise, whilst perhaps a little too expensive for some activities (14: +1) means it is something that they can't afford to do (54: -2). They also don't seem to find that time is a barrier to them exercising as was expressed by some of the parents in other factors (50: -1, 56: -1, 2: +1). Nor do they appear to experience the embarrassment associated with exercise evident in the understandings represented in the other factors (26: -1, 19: -1,20: 0). They support the notion, much like the parents in the other factors that sport and exercise need to be made a fun family activity in order to encourage their children to participate in them (65: +4, 58: +3, 53: +2). They also believe their children's health is more important than the cost of exercise and sport (16: +3).

There is some suggestion that the fathers feel there is some confusion surrounding health messages. They feel that different sources sometimes provide contradictory

guidance (32: +2) and that messages around portion size in particular are unclear (33: +2). However they are more ambivalent about the notion that food advertising can be misleading (31: 0). Despite this they don't appear to be overly concerned about what their children pick up from health messages (39: -2, 25: 0, 30: 0).

4.3.7 Verifying the interpretation

As mentioned earlier in this chapter, participants who had loaded significantly onto the exemplary sorts were invited to provide feedback on the factor interpretations. Nine participants responded to this request; 2 from Factor A, 1 from Factor B, 2 from Factor C, 1 from factor E and 3 from Factor F, no participants represented by Factor G responded. As so few participants responded their feedback should be considered with caution however the overall consensus was that the interpretations were a fair description of their understandings and experiences. One of the participants who loaded significantly onto Factor A felt that "overall it does describe my situation, but I do exercise regularly, it says here that I struggle to fit in exercise, but I wouldn't really say I do". This sort of comment rather than suggesting the interpretation is in adequate is a reflection of the difference between the exemplary sort and the individual participants actual sorts. In another instance a participant who loaded significantly onto factor C said "It says here that I don't really feel strongly that ICT skills are important, I do think they're important I just think there were some statements that I couldn't put exactly where I wanted to because of the grid." Again this comment doesn't mean that the interpretation was incorrect but reflects the forced nature of the distribution, and as above, the summary was produced from the exemplary sort and not from the individual participants' sorts. Drawing concrete conclusions from this feedback is not appropriate as only a minority of participants provided comments on the summaries, however it is useful to consider feedback on the whole, suggested that the sorts had been accurately interpreted.

4.4 Discussion

This study sought to identify the extent to which the experiences and barriers identified by the parents in study 1 (chapter 3) were shared by other parents, both those with low-SES and parents who had a higher SES. The Q-sort analysis

highlighted 6 distinct understandings concerning lifestyle behaviours related to diet and physical activity and the role of technology in family life. In addition it was also important to explore in more detail the barriers and beliefs that were experienced by the parents with low-SES so a better understanding of the aspects of the health message used in Epton and Harris (2008) could be made more salient to this group.

The analysis showed that whilst there was a variety of understandings and experiences expressed by the participants, no factor was representative of parents from different socio-economic backgrounds; each factor was exclusively representative of individuals from the same SES group. This supports the suggestions highlighted in chapter 1 that interventions and health messages need to consider the experiences of different populations (Albarracin et al., 2005; Michie et al., 2009) as their perceptions of barriers and beliefs may differ on the basis of factors such as their socio-economic status.

Andajani-Sutjahjo et al. (2004) identified barriers such as time and cost, were experienced by young women regardless of their socio-economic status. This, to some extent, is reflected in these findings for example, parents with higher-SES whose understandings were explained by Factor A & F, suggested time was an issue that hindered their own attempts at physical activity, this was also expressed by the low SES parents of Factors B and C. Some parents with non-low SES also acknowledged cost could be an issue in eating a healthy diet (Factor A) although other factors that represented non-low SES parents didn't (Factors E, F & G), although this may reflect that cost isn't a concern for them, rather than it not being a barrier for other parents.

It is interesting to note that the differences between the understandings evident here are subtle, however they highlight the extent to which the participants' experiences and circumstances shape their understandings, beliefs and perceptions. For example, all the parents represented by the factors presented here, acknowledged their responsibility to set an example to their children by engaging in healthy lifestyles. Parents across the factors also felt that they knew what behaviours were conducive with healthy lifestyles, but differences were expressed in their positioning of statements that related to their actual behaviours. Factors C and A both represented a

belief that physical activity was important and that making it fun made it easier. However, Factor A represented parents reporting they tried to get involved in physical activity themselves, where possible and this Q-sort suggested that the statements relating to barriers formed a less important aspect of their experience. On the other hand, parents represented in Factor C rated statements related to barriers to exercise as more like their experience than those statements relating to their own physical activity. This suggests these barriers are things they experience in relation to physical activity. It was apparent the parents experienced differences in the extent to which perceived barriers affected their ability to engage in healthy behaviours. For example, low-SES parents whose experiences where expressed in Factor B shared the concerns with other low-SES parents in Factor C about cost being an issue in eating healthily and taking part in exercise. However the parents represented in Factor B emphasised that with the right strategies in place these barriers could be overcome. This has important implications as it suggests that identifying strategies to address this within a health message may encourage healthier behaviours. This is consistent with Epton and Harris (2008) and particularly relevant to self-affirmation as a behaviour change technique. As it has been identified that self-affirming promotes self-efficacy when coupled with a message that targets feelings of self-efficacy by identifying strategies to overcome barriers (Epton and Harris, 2008).

It is useful to understand the extent to which experiences and barriers expressed by low-SES parents, are shared by parents from a different socio-economic background. It is particularly interesting how the Q-sorts of the low-SES mothers reflected the themes described in study one (chapter 3). As was noted above, there were two factors that represented the understandings and beliefs of exclusively low-SES parents, Factors B and C. These two Factors have interesting implications for this thesis as they highlight not all low-SES parents experience or deal with barriers in the same way. It also supports promoting aspects of a message that relate to self-efficacy. In that, for individuals who perceive barriers such as cost, it could be effective to promote methods to overcome these barriers that work for other individuals in similar circumstances to themselves. Whilst considering the differences in understandings of these two groups of low SES parents, it is important to bear in mind that the perception of barriers is likely to be a hindrance to adopting healthy behaviours. In cases where barriers are perceived to be less of an obstacle,

behaviour change is likely to be easier. It is in instances where barriers are perceived to be more difficult to overcome that individuals will benefit most from behaviour change techniques. Part of the behaviour change process is finding strategies to overcome barriers and the belief an individual is capable of putting those strategies into action Floyd, Prentice, Dunn and Rogers (2000).

It is important to highlight that the factors interpreted here are not a comprehensive list of those which may exist amongst the general population. The data used to generate the Q statements came from a highly relevant, but small sample. Conducting the Q-sort itself, with further participants may reveal additional factors not evident amongst this sample.

4.5 Chapter summary

This study aimed to explore the findings outlined in study 1 (chapter 3) in more detail through the use of Q-methodology. The interview data from study 1 was used to generate a concourse from which a set of Q-sort statements was produced. Both parents with low and non-low SES took part in the study, in order to identify the most salient aspects of the low SES parents' understandings. This method also allowed an exploration of the barriers to adopting a healthy lifestyle in relation to each other, highlighting those that were the most commonly experienced. The analysis showed that many parents across socio-economic groups experienced barriers such as time, cost and fussy eaters, however there were differences in the extent to which the parents found ways to overcome these barriers. The experiences of parents with low SES were explained by two factors, the key difference between the two being the belief that being on a low-income made it hard it be healthy. This reflected a difference in attitude towards their circumstances and shows that with the right strategies in place parents on a low-income needn't feel that cost hinders their ability to be healthy. Chapter 7 will consider how these findings informed the development of the intervention and the health message.

Chapter 5: Piloting the self-affirmation manipulation online (study 3)

This chapter describes the trialling of self-affirmation manipulations online when the health message is presented as a website. The primary aim of this study is to assess if the self-affirmation technique functions both as an online exercise and in relation to health related information that is presented via the Internet, previous studies have only assessed its effectiveness in relation to offline health messages. Whilst measures are taken of pre and post manipulation behaviours in this study the primary aim is to pilot the technique as part of a web-based intervention rather than affecting a change in behaviour. This chapter presents the findings of the pilot in relation to both fruit and vegetable consumption and physical activity and also in relation to both behaviours combined. The findings are discussed in relation to previous research findings and also in terms of developing the final intervention.

5.1 Rationale

The pilot study described in this chapter focuses on the online delivery of an established method of intention and a potential method of behaviour modification; Self Affirmations (SA) described in chapter 2. Given the pilot nature of this study it was deemed suitable to recruit participants from the student population. Using a student sample also meant the health message could be taken directly from the research by Epton and Harris (2008), as a student sample has been used in their study.

In addition to testing if self-affirmation is a method suitable for inclusion in an online intervention, this pilot also aimed to expand the range of behaviours that could be potentially modified through self-affirmation. Epton and Harris (2008) suggested self-affirmation might be suitable for adapting other health promoting behaviours such as physical activity. In this pilot study therefore, the purpose was to investigate the effect of self-affirmation on not only fruit and vegetable consumption but also physical activity levels and participants intentions to engage in such health promoting behaviours. In addition, given the importance of both physical activity and diet to all over health, as established in chapter 1, it was also of interest to see if both behaviours, or intentions towards engaging in both could be modified through

self-affirmation. Based on these modifications one group of participants were presented with two health messages one for fruit and vegetable consumption and the other concerned with physical activity and pre and post measures of both behaviours were taken. Participants were either allocated to one of three behaviour groups: 1) fruit and vegetable consumption alone; 2) physical activity alone or 3) combined fruit and vegetable consumption and physical activity. Essentially this chapter presents three pilot studies testing the effects of self-affirmation with different health related behaviours as their focus.

In order to look at physical activity as well as fruit and vegetable consumption, a separate health message was developed concerned with physical activity. The health message used in Epton and Harris (2008) provided the basis to develop a health message concerned with physical activity based on the recommendation of 30 minutes of moderate activity at least 5 times a week taken from government guidelines. It was independently judged using a 5 point rating scale by 10 colleagues of the researcher to match the fruit and vegetable message in terms of information including benefits and recommendations, the consequences of unhealthy lifestyles and suggestions for improving the relevant behaviour.

The primary aim of this pilot study was to successfully deliver a self-affirmation manipulation online, based on Epton and Harris, (2008). The success of the intervention was assessed through two measures; the self-affirmation manipulation check described in Napper, Harris and Epton (2009), a measure of intent to adopt the behaviour recommendations contained in the health message. A measure of the subsequent relevant health behaviour; fruit and vegetable consumption; time spent being physically active or both was also taken. Demonstrating behaviour change was not a primary focus of this pilot study as sample size was likely to prevent this from being accurately determined. It was hoped the data might give an indication of the potential this intervention has for changing behaviour.

It was hypothesised that;
1. Participants who self-affirmed would score significantly higher on measures of intent to change their behaviours than non-affirmed participants.

2. Self-affirmed participants would score significantly higher on the self-affirmation manipulation check than those participants in the control group.

3. Healthy lifestyle behaviours (fruit and vegetable consumption, physical activity or both) would increase amongst the participants whom had self affirmed as opposed to those in the control group.

Additional measures were also included following the findings of Epton and Harris (2008) to look at the suggested effect of self-affirmation on response efficacy and self-efficacy. Although it is not central to this thesis to explore the processes at work in self-affirmation this information may provide an insight into aspects of the health message that may be modified to specifically address response efficacy and self-efficacy as indicated by Epton and Harris (2008).

5.2 Method

5.2.1Design

This pilot study included three independent groups, each one completing the same procedures but the health behaviours in question were different for each group. Each group was divided into two between subjects' conditions, one experimental where they self-affirmed according to the procedures of Epton and Harris (2008) and one control condition where the personal opinions questionnaire used in Epton and Harris (2008) was completed by participants. For an explanation of the distribution of participants across conditions and behaviour groups see Table 5.1.

Table 5.1 Distribution of participants across the testing conditions and the behaviour groups

Behaviour Groups	Self-affirmed (SA)	Non-affirmed (NA)
Fruit and Vegetable Consumption (FV)	10	9
Physical Activity Levels (PA)	10	10
Combination of both fruit and vegetable Consumption and physical activity levels (COMB)	10	10

5.2.2 Participants

An opportunity sample of ninety-four undergraduate psychology students was recruited through the Psychology department's student recruitment scheme.

5.2.3 Materials

A computer programme was designed to deliver the measures and study information to the participants. The health message was designed as a series of webpages so as to replicate a website providing health information, screen shots of this can be found in Appendix 10.7. The website presenting the health message and the webpages presenting the additional measures were designed to be distinctly different in order to support the notion that this single study was actually a series of unrelated studies as in Epton and Harris (2008). The additional measures were all adapted from Epton and Harris (2009) with the exception of the self-affirmation manipulation and control task taken from Reed and Aspinwall (1998) and the EPIC-Norfolk Food Frequency Questionnaire and Physical Activity Questionnaires (FFQ &PAQ), selected because of their highly validity and reliability:

http://www.srl.cam.ac.uk/epic/nutmethod/FFQii.shtml;

http://www.srl.cam.ac.uk/epic/questionnaires/epaq2/).

5.2.3.1 Baseline measures

Fruit and vegetable consumption and physical activity levels: Baseline measures were taken of current fruit and vegetable consumption, physical activity levels or both. These were recorded using an adaptation of the EPIC-Norfolk FFQ and PAQ. These validated food frequency and physical activity questionnaires were used to generate comprehensive lists of fruit and vegetables and different types of physical activity. In order to make them suitable for inclusion in this study they were adapted so that participants were asked the number of portions of each of the fruits and vegetables they had eaten in the last week and/or the amount of minutes they had spent doing any of the physical activities listed over the course of the last week. Options were also provided for "other" on each sheet to account for anything that may not appear on the lists. Participants were also provided with guidance as to what constituted a portion of fruit or vegetables based on the premise that one

portion is approximately 80g. Furthermore participants were also asked if for any reason their fruit and vegetable consumption or physical activity levels had differed in the last week from normal and if so how – no participants said the previous week had differed from normal. This data was used to calculate the participants' average daily fruit and vegetable consumption and/or physical activity levels per day.

Readiness to Change: This was gauged via an adapted measure from Laforge, Green and Prochaska (1994) as used in Epton and Harris (2008). A series of 5 questions requiring a Yes/No answer allowed participants to be categorised in one of the following six stages of change; Pre-contemplation, Contemplation, Preparation, Action, Maintenance and Maintenance of a long running behaviour. Each stage was coded (1-6) to facilitate the generation of mean readiness to change scores across the behaviours. This was important to ensure both groups were at an equal stage in adopting or maintain behaviours conducive to good health.

5.2.3.2 Intervention

The self-affirmation manipulation developed by Reed and Aspinwall (1998) posed a series of questions such as; *"Have you ever forgiven another person when they hurt you"*. When participants gave a 'yes' answer they were asked to type an account of this experience.

The personal opinion questions used as the control group task were also taken from Reed and Aspinwall (1998). This involved a series of questions designed to follow the same format as the self-affirmation questions but to elicit only the participants' opinions on a range of arbitrary subjects. *"I think chocolate is the best flavour of ice cream"*. When answering 'yes' they were asked to explain why.

Copies of the full self-affirmation manipulation questions and the control task questions can be found in Appendices 10.8 & 10.9.

5.2.3.3 The health messages

The health message concerned with fruit and vegetable consumption was based on that used in Epton and Harris (2008) which was developed from government websites relating to eating 'five a day'. As detailed above the physical activity level health message was designed to match the fruit and vegetable consumption message and was also based on government guidelines (Appendix 10.7)

5.2.3.4 Post-manipulation measures

Intentions were, as in Epton and Hariis (2008), measured by two questions; "*Do you intend to eat at least 5 portions of fruit and vegetables each day in the next seven days*" and "*I intend to do at least 30 minutes of exercise three times a week over the next seven days*". Responses were measured on a 7-point scale.

Self-efficacy was measured using 4 items Epton and Harris (2008) adapted from Fuchs et al. (1993). Responses to items such as "I know for sure I could adhere to eating at least five portions of fruit and vegetables a day." and "I doubt I could manage to eat at least 5 portions of fruit and vegetables a day" were given on a four point scale ranging from 1 (not true at all), 2 (barely true), 3 (moderately true) to 4 (exactly true). See Appendix 10.10

Response-efficacy was measured using six items taken from Epton and Harris (2008). For example, "Eating five portions of fruit and vegetables a day will reduce my risk of heart disease and some cancers" and "Eating at least five portions of fruit and vegetables a day will improve my health by boosting my immune system". Responses were given on a 7 point scale from agree to strongly disagree. See Appendix 10.10

Word recall task: As a guise a word recall task was also included to distract participants from the true purpose of the study. Participants were presented with a series of words and had to say whether or not they had appeared in the health information.

Manipulation Check: A manipulation check (Napper et al., 2009) was included to ensure participants in the experimental condition had self-affirmed. This is designed to tap into what the participants were thinking about themselves when they were completing the self-affirmation task or the control task. This check also demonstrated the self affirmation task had prompted the participants to think more positively about themselves than those participants in the control group, Napper et al. (2009) propose that this demonstrates participants had engaged in the task appropriately and had therefore, self-affirmed. See Appendix 10.11

Post-manipulation behaviour measure: Participants received a unique computer generated user ID code by e-mail to preserve their anonymity. They were instructed to log on to a website every day for the next seven days to complete a measure of the relevant behaviour [physical activity levels (PA), fruit and vegetable consumption (FV) or both (COMB)]. They had to complete a further adapted version of the FFQ and/or PAQ by recording the portions of fruits and vegetables and/or the time they had spent being physically active in the last 24hours.

5.2.4 Procedure

Participants were asked to attend a testing session within the University; they were informed that this would last around 30 minutes, and a further 30 minutes of the participants' time would be required by spending approximately 4-5 minutes a day for the next seven day completing a brief online questionnaire. Participants were informed they were taking part in a series of studies investigating the communication of health information online, personality and beliefs. The computer programme randomly assigned the participants to either the control condition or the experimental condition. Consent and briefing information was delivered via the computer programme, and on consenting to participate, participants were assigned a participant number. They were then directed to the study web page and worked their way through the series of post manipulation measures. On completing participants were told they would receive an e-mail later that day containing a link to another website. They were asked to log on to this daily for seven days to complete a questionnaire, (either a version of the PAQ, FVQ or both). Participants also received daily e-mail reminders to log on and on completion of the seven-day diary participants were

redirected to another web page where they were presented with debriefing information.

5.3 Results

Through attrition-21 participants did not complete the entire study and unusable data was received from 15 participants. Data was unusable when it was clear participants had not answered questions appropriately, for example one participant reported engaging in every single physical activity appearing on the list for 20 minutes every day. And another reported eating on average 76 portions of fruit and vegetables a day. This left 59 participants in total (n=59, 54 female, 5 male). Mean age of participants was 20.55 years (sd = 3.19 years).

Baseline behaviour measures and readiness to change were used to establish that the two groups were matched at baseline. t-tests revealed no significant difference between the conditions across any of the groups in their baseline fruit and vegetable consumption, or baseline levels of physical activity (see Table 5.2), or their readiness to change (see Table 5.3) These results suggest that randomisation to condition had been successful. The results are subsequently presented in terms of the three hypotheses for each of the groups.

Table 5.2 Comparison of baseline behaviour measures between the conditions for each behaviour group

| | Behaviour | Baseline | | | |
		SA Mean (SD)	NA Mean (SD)	t (df)	p
Fruit/Veg	FV Only	4.63 (1.25)	6.00 (5.13)	0.82 (1,17)	0.424
Consumption (portions)	FV Combined	7.06 (5.42)	4.84 (2.44)	1.18 (1,18)	0.253
Physical Exercise	PA Only	10.60 (9.03)	20.86 (15.30)	1.89 (1,18)	0.084
(minutes per day)	PA Combined	25.54 (24.69)	13.30 (10.66)	1.44 (1,18)	0.167

Table 5.3 Comparison of readiness to change between conditions for each behaviour groups

| | Behaviour | Readiness to change | | | |
		SA Mean (SD)	NA Mean (SD)	t (df)	p
Fruit/Veg Consumption (portions)	FV Only	4.00 (0.81)	4.00 (0.87)	0.00 (1,17)	1.000
	FV Combined	4.40 (1.07)	3.80 (1.47)	1.04 (1,18)	0.312
Physical Exercise (minutes per day)	PA Only	3.80 (1.32)	3.60 (0.96)	0.39 (1,18)	0.703
	PA Combined	3.20 (1.55)	3.60 (0.84)	-0.717 (1,18)	0.482

5.3.1 The effect of self-affirmation on intent, response efficacy and self efficacy

The first hypothesis stated self-affirming would lead to greater intent to perform risk reducing behaviour. The results presented below demonstrate the effect of self-affirmation on measures of intent. In addition the effects of self-affirmation on the additional measures of response efficacy and self-efficacy are also reported here (see Table 5.4). They are discussed for each of the three groups separately.

Table 5.4 Mean (and standard deviations) of post manipulation measures in each group for both self-affirmed (SA) and non-affirmed (NA) participants

Behaviour	FV Only		FV Combined		PA Only		PA Combined	
	SA	NA	SA	NA	SA	NA	SA	NA
Intent	5.20 (1.14)	3.89 (1.54)	5.70 (1.32)	4.15 (1.36)	5.00 (1.11)	3.30 (1.80)	6.00 (1.40)	4.05 (1.94)
Response Efficacy	5.52 (0.64)	4.76 (0.64)	6.10 (0.66)	5.27 (0.95)	5.90 (0.70)	5.65 (0.98)	6.02 (1.39)	5.37 (0.68)
Self-Efficacy	2.33 (0.41)	2.47 (0.40)	2.75 (0.37)	2.55 (0.28)	2.38 (0.36)	2.50 (0.55)	2.78 (0.46)	2.43 (0.29)

5.3.1.1 Fruit and vegetable group

A one-way between subjects ANOVAs comparing the self-affirmed group and the non-affirmed group on each measure, revealed an effect of self-affirmation on intent, the manipulation check, response efficacy and self-efficacy (for descriptive statistics see Table 5.4). The analysis revealed intent to consume five or more portions of fruit and vegetable a day was significantly higher in self affirmed participants than non affirmed, $F(1,17) = 4.50$, $p = .048$. The analysis also suggested self-affirmation lead to higher feelings of response efficacy in comparison to the control group, $F(1, 17) = 6.730$, $p = .019$. However, the analysis revealed no significant differences in feelings of self-efficacy between groups $F(1,17) = 0.621$, $p = .442$. In terms of the hypotheses the results suggest that self-affirmation did lead to increased intent to perform risk-reducing behaviours (increase fruit and vegetable consumption).

5.3.1.2 Physical activity group

The analysis is described in the previous section was replicated (descriptive statistics are shown in Table 5.4. The one-way ANOVA revealed intent to engage in at least 30 minutes of physical activity at least 5 times a week, was significantly higher in self affirmed participants than non affirmed, $F(1,18) = 6.49$, $p = .020$. Interestingly the ANOVA for this group suggested that self-affirmation did not lead to higher feelings of response efficacy, $F(1,18) = 0.433$, $p = .519$ or self-efficacy, $F(1, 18) = 0.349$, $p = .562$. As with the fruit and vegetable group, in terms of the hypothesis, the results suggest that self-affirmation did lead to increased intent to perform risk-reducing behaviours in this case physical activity levels.

5.3.1.3 Combined group- fruit and vegetable

Once again following the analysis procedures outlined above, the one-way ANOVA showed that participants in the self-affirmed condition scored significantly higher on the measure of intent to eat 5 or more portions of fruit and vegetables a day than their non affirmed counterparts, $F(1,18) = 6.731$, $p = .018$. Furthermore, as with the fruit and vegetable group the analysis showed feelings of response-efficacy were also

significantly higher in the self-affirmed participants than in the non-affirmed, $F(1,18) = 4.769$, $p = .042$. Feelings of self-efficacy was once again not significantly different between the groups $F(1,18) = 1.823$, $p = .194$. The results suggest that for the combined group self affirmation did lead to higher intent to eat five or portions of fruit and vegetables a day and as with the fruit and vegetable group response efficacy was significantly higher in the self affirmed group than non-affirmed, once again no difference was found in feelings of self-efficacy nor was there a difference in the groups consumption of fruit and vegetables post manipulation.

5.3.1.4 Combined group- physical activity

The results of the of the one-way ANOVA showed that intent to engage in at least 30 minutes of physical activity at least 5 times a week, was significantly higher in self affirmed participants than non affirmed, $F(1,18) = 6.68$, $p = .019$. Interestingly the ANOVA for this group suggested that self-affirmation did not lead to higher feelings of response efficacy, $F(1,18) = 4.00$, $p = .061$ or self-efficacy, $F(1, 18) = 4.10$, $p = .058$. The p values for both of these measures are approaching significance suggesting there may have been some effect of condition on these measures however this needs to be treated with a lot of caution considering the small sample size and the lack significance of these measures in this group replicate those in the physical activity group. As demonstrated in the previous analyses, self affirmed participants had significantly higher intent to engage in at least 30 minutes of physical activity a day, however this was not translated into a change in their behaviour when baseline behaviour was controlled for. As in the physical activity group previously there was no observed effect of self-affirmation on either response efficacy or self-efficacy.

5.3.2 The manipulation check

The second hypothesis stated that participants who self affirmed would score higher on the manipulation check than the control group (See Table 5.5 for descriptive statistics). This would indicate that the self-affirmation manipulation had been successful and the participants in the experimental group had self-affirmed. The manipulation check scores were included in the ANOVA reported above, but are reported here in terms of the second hypothesis.

Table 5.5 Mean (and standard deviations) of the manipulation check scores in each group for both self-affirmed (SA) and non-affirmed (NA) participants

Behaviour	FV Only		FV Combined		PA Only		PA Combined	
	SA	NA	SA	NA	SA	NA	SA	NA
Manipulation	5.10	4.00	5.00	3.80	5.50	4.20	5.00	3.80
Check	(1.29)	(0.71)	(0.67)	(0.79)	(1.36)	(1.03)	(0.67)	(0.79)

5.3.2.1 Fruit and vegetable group

The manipulation check scores suggested that participants in the self-affirmed condition had self-affirmed as they scored significantly higher on the measure than non-affirmed participants, $F_{(1,17)} = 5.155$, $p = .036$. The manipulation check results suggest that participants in the experimental condition successfully completed the self-affirmation manipulation and had, therefore, self-affirmed supporting hypothesis two.

5.3.2.2 Physical activity group

As with the fruit and vegetable group the manipulation check scores suggested that participants in the self-affirmed condition had self-affirmed scoring significantly higher on the measure than non-affirmed participants, $F_{(1,18)} = 5.828$, $p = .027$. The manipulation check results support the second hypothesis and suggest that participants in the experimental condition successfully completed the self-affirmation manipulation and had, therefore, self-affirmed.

5.3.2.3 Combined group

The manipulation check was included in the one-way ANOVA as above, and the results showed that participants in the self-affirmed condition scored significantly higher on this measure than the non-affirmed control group, $F_{(1,18)} = 13.50$, $p = .002$. Once again confirming that the manipulation had been successful, supporting the second hypothesis.

5.3.3 The effect of self-affirmation on behaviour

The effect of self-affirmation on behaviour is presented below for each of the groups, descriptive statistics are presented in Table 5.6 below.

Table 5.6 Mean (and standard deviation) for post manipulation behaviours for each self-affirmed (SA) and non-affirmed (NA) participants

	Behaviour	Post Manipulation	
		SA Mean (SD)	NA Mean (SD)
Fruit/Veg Consumption (portions)	FV Only	5.45 (2.03)	4.95 (2.54)
	FV Combined	5.23 (2.33)	4.70 (1.55)
Physical Exercise (minutes per day)	PA Only	35.71 (30.65)	30.60 (33.80)
	PA Combined	59.40 (51.39)	53.60 (41.99)

5.3.3.1 Fruit and vegetable group

To assess the impact of the intervention on fruit and vegetable consumption, a one-way ANCOVA was conducted with mean, post-manipulation fruit and vegetable consumption per day as the dependent variable, condition (self-affirmed or non-affirmed) as the between subjects factor and baseline fruit and vegetable consumptions per day as the covariate (to control for differences in the participants baseline behaviour). The results revealed no significant difference between the groups $F(1,16) = 1.006$, $p = .059$. It is important to note that whilst this is a particularly small sample size, and thus warrants cautious interpretation of the data, the difference between the conditions is approaching significance. The descriptive statistics in Table 5.5 show, the mean number of portions of fruit and vegetables was higher in self-affirmed participants than in non-affirmed, indicating a trend that suggests higher consumption post manipulation in self-affirmed participants.   In terms of the third hypothesis no significant difference in the post manipulation fruit and vegetable consumption when controlling for baseline consumption, suggests that the manipulation did not lead to the hypothesised behaviour change, although there is evidence of a trend in this direction.

5.3.3.2 Physical activity group

The one-way ANCOVA was conducted with mean, post-manipulation physical activity levels per day as the dependent variable, condition (self-affirmed or non-affirmed) as the between subjects factor and baseline physical activity levels per day as the covariate (to control for differences in the participants baseline behaviour). As in the fruit and vegetable group the analysis revealed no significant difference between the groups $F_{(1,17)} = 1.494$ p = .238. However unlike the fruit and vegetable group the difference was not approaching significance. The descriptive statistics in Table 5.5 show, the mean number of minutes of physical activity per day was slightly higher in self-affirmed participants than in non-affirmed although this difference was not significant. In terms of the third hypothesis no significant difference in the post manipulation physical activity levels when controlling for baseline levels, suggests that the manipulation did not lead to the hypothesised behaviour change.

5.3.3.3 Combined group- fruit and vegetable

The one-way ANCOVA was conducted with as in the fruit and vegetable group analysis. The results revealed no significant difference between the groups $F_{(1,17)} = 0.77$, p = .785. The descriptive statistics in Table 5.5 show, the mean number of portions of fruit and vegetables was higher in self-affirmed participants than in non-affirmed. As in the groups described above, self-affirmation did not induce the hypothesised change in behaviour.

5.3.3.4 Combined group- physical activity

The one-way ANCOVA revealed no significant effect of condition on post-manipulation physical activity levels, $F_{(1,17)} = 0.004$, p =.951. The descriptive statistics are presented in Table 5.5 again, the results how the hypothesised change in behaviour did not occur.

5.4 Discussion

Results of this pilot study are tentative given the small sample size. However self-affirmation has been consistently shown across all groups to lead to higher intent to perform the relevant risk reducing behaviour; eating 5 or more portions of fruit and vegetables a day or engaging in at least 30 mins of physical activity a day. This is consistent with previous findings of self-affirmation studies, as established in chapter 2. However in none of these studies was intent translated into behaviour change when baseline measures were controlled for. Despite this across all groups the mean post manipulation measures were higher for self-affirmed participants than for non-affirmed participants, which is a promising observation in terms of behaviour change. A larger sample will be needed in order to better demonstrate these effects and this will be addressed when the final intervention is tested. Baseline measures of fruit and vegetable consumption in particular, but for physical activity- if you consider that 5 x 30 minutes a week translates to slightly over 20 minutes a day, were all quite close to the levels recommended in the health message. If this is the case then self-affirmation is unlikely to have had a great effect as it has been demonstrated (Armitage et al, 2008; Harris et al, 2007). It is those individuals whose behaviour diverges most from what is recommended and thus putting themselves at greater risk of the negative outcomes, who are most likely to be affected by self-affirmation. This may go some way to explain why the hypothesised behaviour change was not observed.

It is promising that across all groups the manipulation check scores demonstrated the self-affirmation manipulation had successfully worked online, which establishes the potential for self-affirmation interventions to be delivered online. This supports pursuing self-affirmation as a behaviour change technique used in an intervention that will be described later in this thesis (chapter 8).

It is interesting that response-efficacy was only higher for fruit and vegetable consumption (both the fruit and vegetable and the combined group). This is consistent with Epton and Harris (2008) and as they argue, is probably reflective of specific aspects highlighted in the health message. The lack of significant difference in response-efficacy between conditions for physical activity suggests the health

message did not sufficiently establish the link between adopting the risk reducing behaviours and achieving the positive health benefits of doing so. This is interesting, as independent raters had judged the messages to be equal in this regard. It is possible this is also reflective of the participants underlying beliefs perhaps suggesting people are more convinced in general of the link between fruit and vegetable consumption and health outcomes than they are of the link between physical activity and health outcomes although this remains to be established.

Ratings of self-efficacy are noticeably consistent across all groups and between those conditions in the groups. This suggests that self-affirmation did not promote self-efficacy, potentially because the health message did not encourage participants of their capability to perform the risk reducing behaviours. Research (Jessop et al., 2009) has shown that self-efficacy is likely to be increased if health messages address the specific barriers preventing people from adopting such risk reducing behaviours. Through understanding the specific barriers to adopting such behaviours, as has been done in studies 1 and 2, aspects of the message can be adapted to help ensure participants feel they are able to make such changes to their lifestyle. This will be addressed in this thesis by incorporating recommendations into the health message that are suitable for the target populations.

It was useful that this study demonstrated the potential for self-affirmation manipulations to be tested across other behaviours such as physical activity, and that it may be possible to address more than one behaviour at a time. There are however logistical considerations to be made about this in terms of recruiting sufficient participants and in terms of developing this online intervention it is preferable to pursue modification of only one behaviour. The results here are most promising in relation to fruit and vegetable consumption and thus the final online intervention will focus solely on fruit and vegetable consumption.

A further issue with this study was the measures used to record baseline and post-manipulation behaviour. A lot of potential data was lost due to participants clearly not completing the measures accurately. Furthermore the measures were potentially not subtle enough to accurately record the participants' behaviour. For example, recommendations for fruit and vegetable consumption state that they should eat 5 or

more portions of different fruit and vegetables and this could not be accounted for in the baseline measure. This issue will also need to be addressed in the final intervention.

This was a pilot study solely assessing the self-affirmation technique and it's suitability as an online intervention technique. The website used to present the health message in this study was not developed to ensure it was viewed as trustworthy, credible or visually appealing to the target audience and there is a possibility that this impacted the participants' perception of the health message. The next study described in the following chapter will seek to determine what constitutes a credible health related website in the eyes of both students and parents with low SES.

5.5 Chapter summary

This chapter has presented the findings from a pilot study to assess if self-affirmation is a suitable technique to adopt in an online intervention. The study assessed the effect of self-affirmation to increase intent to perform risk-reducing behaviours; fruit and vegetable consumption, physical activity and a combination of both. Consistent with previous research, self-affirmed participants reported greater intent to perform such behaviours. There is also some evidence self-affirmed participants had higher feelings of response and self-efficacy in relation to performing these behaviours. The participants in this study did not show evidence of a significant increase in performing risk-reducing behaviours however trends in the data are indicative of this. The evidence reported here suggests self-affirmation can improve message acceptance and supports the use of the technique in an online intervention. However further considerations need to be made about the appropriate way to display a health message on a website. The next chapter (6) will investigate what constitutes a credible health related website to improve this element of the intervention. A further discussion of how these findings have informed the development of this online health intervention is presented in chapter 7.

Chapter 6: What makes a health related website credible? (Study 4)

This chapter presents the findings of a framework analysis to identify what constitutes a credible health related website. The website credibility models outlined in chapter 1, were used to identify the key concepts relating to website trust in the eyes of the target audiences. Interviews were carried out guided by questions that focused on a) Quality of Information and Expertise b) Trustworthiness and Impartiality c) Design Credibility and Visual Appeal d) Personalisation. These concepts also provided a focus for the analysis of the data. The findings are presented in terms of the preferences of students and parents with low SES. A consideration of how these can be incorporated into the design of the website presenting the health message in the final study is also provided.

6.1 Rationale

Chapter 1 identified when developing websites for a health intervention it is particularly important to ensure the websites are perceived as credible in the eyes of the target audience. Chapter 1 also identified two models that have been developed to predict trust in online information (Cugelman et al., 2009 & Harris et al., 2011).
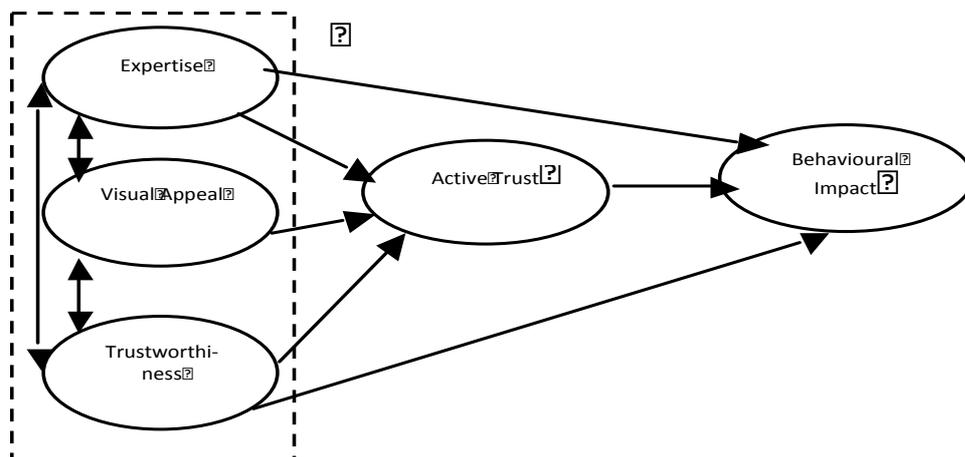
Figure 6.1 Three-dimensional human model (Cugelman et al., 2009)
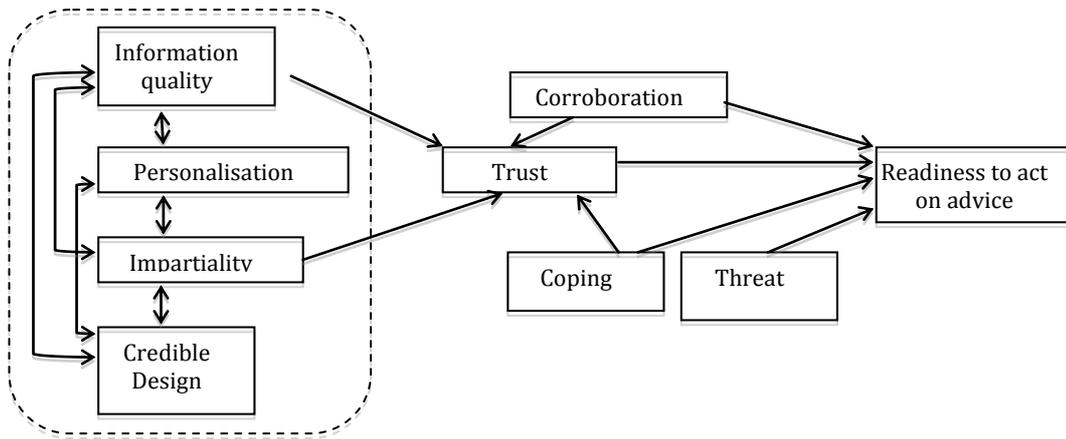
Figure 6.2 Model of trust in relation to health advice websites (Harris, Sillence & Briggs, 2011)

This study employs a framework analysis (Ritchie & Spencer, 1994) with the aim of;

1. Identifying what constitutes a credible and believable health website.

2. Highlighting what aspects of the website contribute to this.

These models (see Figure 6.1 & 6.2) of website trust and credibility described in chapter 1 were used in order to generate interview questions and in developing the analysis framework. Table 6.1 demonstrates how questions from the interview guide related to the concepts identified in the models. It is important to point out this study is focused on highlighting specific aspects that lead to a website being perceived as trustworthy and therefore the interview questions and the framework were based on the factors that lead to 'Active Trust' in the Cugelman model and "Trust" in the Harris model.

Table 6.1 Example of interview questions and their relation to the credibility constructs

Credibility constructs	Examples of interview guide questions
Quality of Information and Expertise	Do you believe the sources of information are experts? Why? Do you feel the site was owned developed by a well-known organisation?
Trustworthiness and Impartiality	Do you trust the source of the information? Why? Do you believe the source to be impartial? Why?
Design Credibility and Visual Appeal	Is it visually appealing? Why? Does the site appear professional? Why?

Personalisation	Do you feel the advice and information is relevant to you? Why?
	Do you feel the advice and information is usable for you? Why?

6.2. Method

6.2.1 Approach

This study used a structured qualitative approach and employed framework analysis to identify what the participants perceived as credible online healthy eating advice.

6.2.2 Participants

This study examined the views of two groups, participants from the target population, parents with low-SES and student sample. At this point, it is important to reiterate that over the course of conducting the research for this thesis, the possibility to recruit sufficient low SES parents to participate in a full evaluation of the final intervention changed, this will be discussed in more detail in chapter 9. Students were deemed a suitable sample to include in evaluating the final intervention because evidence shows they also have low fruit and vegetable consumption (Li, et al., 2011). Furthermore the original health message, developed by Epton and Harris (2008) had been used with a student sample and therefore required minimal modification. It was important however to assess their views on the credibility of online health information to ensure the two websites that were developed were equally suited to the two groups, hence their inclusion in this study.

Twenty four participants were recruited to take part in this study, 12 mothers with low SES and 12 university students. The low SES mothers were and were recruited through Sunderland Children's Centres and reimbursed for their time with a £5 shopping voucher. This was agreed as a suitable means so as not to interfere with any benefits they were receiving. The university students were recruited through the Department's research participation pool and took part in exchange for course credits.

6.2.3 Materials

Internet connected laptop, with CamStudio[TM] Software (http://camstudio.org/) installed. Study instructions and interview questions (see Appendix 10.12 & 10.13).

6.2.4 Procedure

Participants from Group 1 attended a local Children's Centre where a quiet room was set up with an Internet connected laptop. Group 2 participants attended Northumbria University Psychology Department where a dedicated room was set up with an Internet connected laptop. In both cases participants were tested individually and provided with information forms and a verbal explanation of the study prior to giving their consent to participate.

Participants were instructed to complete a search using Google for 'healthy eating advice'. They were asked to search as they would normally and select sites they would look at if searching for this type of information for themselves and their family. Participants were given some example sites on a sheet of paper, those that appeared at the top of a Google search (not sponsored sites). This was to reassure participants they were conducting an appropriate search. Participants were told they only had to select websites they would normally choose to look at them.

A structured interview guide was used to ensure questions focused on the factors highlighted in the two models. Therefore, open-ended questions focused on the quality of the information on the websites, whether the organisation responsible for the website was deemed to be expert, or if it seemed like the information on the websites was provided by experts. How impartial and trustworthy the sources of information on the site were and if the participants expected impartiality from the organisation behind the websites and if they felt that the organisation was trustworthy. Questions also focused on the visual appeal of the websites and if the design was deemed to be credible. In addition participants were also asked to consider how relevant and useful the websites were for them personally. These questions did not focus on to what extent the user could 'personalise' the websites but on what extent they felt the information was aimed at them. Participants were also asked to consider whom they thought the websites were aimed at and if they

would act on the information provided. The researcher observed the manner in which individuals searched and ensured participants responded to all the questions for each website they looked at. If participants immediately went to leave a page as soon as it opened they were asked to explain why they had done so. In addition to the observation that occurred during the interview, CamStudio^{TM} software was used to record a video of each participant's search. This could then be watched back alongside the audio recording of the interview to allow the researcher to consider in greater detail the aspects of the websites that the participants were referring to. Interviews lasted between 30mins and 1 hour. Participants were fully debriefed once the interviews were concluded. Once all interviews had been completed the interviews were transcribed verbatim. An example transcript can be found in Appendix 10.14. NVivo^{TM} software was used to aid the analysis process, as it allowed both coding of the transcript and of the video file produced from the CamStudio^{TM} software.

6.2.4 Analysis Procedure

Previous research has showed the advantages of combining the HCI method of usability testing with theoretical modeling to aid the design of health websites (Yardley, Morrison, Andreou, Joseph and Little, 2010). This study aims to apply a similar method to explore perceived credibility and trust in existing websites. The analysis process followed the five-step (see Figure 6.3) procedure set out by Srivastava and Thomson (2009). This involves initially familiarising oneself with the transcribed data; in this case this was done in conjunction with the video files that had been captured.
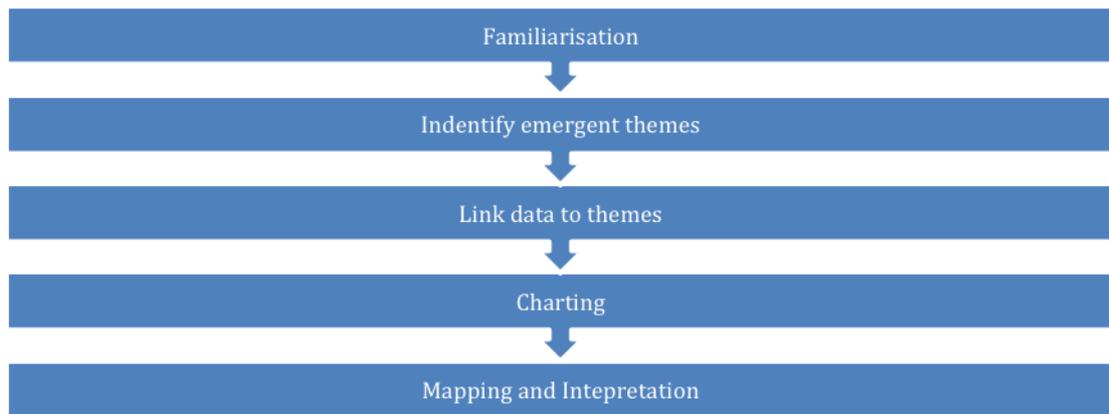
Figure 6.3 Framework analysis process (Ritchie & Spencer, 1994)

The second stage occurs after familiarization when the researcher identifies emerging themes or notions in the data set. In this case the emerging themes had been identified a priori through the use of the models described in Cugelman et al. (2009) and Harris et al. (2011). This was facilitated through the interview guide and its focus on the factors identified in the models. However, it was also particularly important not to focus solely on the aspects of the data that fitted with the factors identified by the models so as not to force the data to fit with the framework. It was essential to also allow themes to emerge that related to aspects not accounted for in the models (Ritchie & Spencer, 1994). However, since the research was designed around a priori issues these formed the key basis for the thematic framework. The initial thematic framework is only exploratory so that it may be refined or modified during the course of the analysis ensuring that the original research questions are being focused on.

Indexing, the third stage in the analysis process, involves identifying portions of the data that link to a particular theme. NVivo^{TM} software was used to facilitate the indexing of the data. The fourth stage is known as charting, this involves arranging the data that was indexed in the previous stage into charts of the themes. The data is transposed from the original context into a set of charts or maps that consist of headings and subheadings relating to the thematic framework. Whilst the data are no longer in their original context it is essential that this can still be clearly identified (Ritchie & Spencer, 1994).

The final stage, mapping and interpretation, involves the developing a schematic diagram of the analysis in order to guide the researcher in their interpretation of the data. It is essential that this interpretation remains grounded in the true attitudes, beliefs, and understandings of the participants. This ensures that the design recommendations generated are truly reflective of the views of the participants.

6.3 Results

24 (n=24) participants took part in this study. 12 were identified as having low SES and were all mothers of school-aged children, mean age 31.3 years (SD 5.4 years). These participants will be referred to as 'Group 1'. 12 further participants were recruited from a student population, mean age 21.2 years (SD 3.6 years). These participants will be referred to as 'Group 2'.

The aim of this study was to identify what the participants viewed as trustworthy websites when searching for healthy eating advice online. Whilst there were some findings that were common across both groups there were also some key differences across the groups. The findings are presented below and aspects specific to the two groups are highlighted. The constructs identified by Cugelman et al. (2009) and Harris et al., (2011) were used to create a framework to focus the analysis on certain concepts previously established as being key when viewing health information online. The framework focused on a) Quality of Information and Expertise b) Trustworthiness and Impartiality c) Design Credibility and Visual Appeal d) Personalisation. The results are presented below

6.3.1 Quality of Information and Expertise

All participants indicated a preference for websites from organisations from the UK. They were familiar with organisations such as the NHS, the British Heart Foundation and Change4Life. They felt confident such websites contained good quality information that had been put together by experts.

*"You just know with sites like this that the
information is right, you know like it's
Doctors who have put the information here"*

<div align="right">*Participant 3 (Group 1)*</div>

*" Well I know these sites have credible
information on them, like I can cite them
as sources in my uni work"*

<div align="right">*Participant 9 (Group 2)*</div>

Interestingly whilst participants noted when the website highlighted the information had been put together by "experts" this wasn't necessarily something they specifically looked for. This was often taken for granted on the basis of the organisation behind the website, some participants reported not ever having thought about it before.

*" Well, I don't know like, I've never really thought
about it. I guess I just take it for granted. I mean
if I read something that I knew wasn't true then I
might not believe the rest of the information, but
you can't just write any thing on a website, can you?"*

<div align="right">*Participant 7 (Group 1)*</div>

*"It's an expert site isn't it? I mean just knowing
the organisation is trustworthy I guess is enough"*

<div align="right">*Participant 3 (Group 2)*</div>

In addition participants felt that much of the information presented was knowledge that they already had. They did however feel the information should corroborate what they already knew. It was also apparent that to the participants in this study high quality information was defined as information that was useful to them, participants from Group 1 placed greater value on practical information such as advice and tips. In contrast Group 2 participants valued information that they could see had been established scientifically. Group 2 took this for granted with sites from organisations they were familiar with, but searched to find a scientific basis for the information when they weren't familiar with the organisation.

*"As if I don't know vegetables are good for me.
I know that already! I like it when they actually
give me tips about how to do things rather than
just telling me what will happen if I don't do things"*

" So on the NHS sites I know that the data has
been tested, like in studies and that, but on sites
like this one, I want to see references I don't just
take their word for it"

Participant 4 (Group 2)

Whilst there was an acknowledgement commercial sites run by large organisations, such as food producers or supermarkets, may not offer the most impartial advice, participants still felt that they tended to offer good quality information. Large organisations were considered more likely to employ their own experts, such as nutritionists, to compile the information.

"Like, I know it's the Tesco's site, and it's
probably to try and get you to shop there, but
it's says this information comes from their expert
nutritionists, so I can still use the tips"

Participant 5 (Group 1)

" It's Kelloggs so I know they want me to buy
their cereals, but I know they have lots of
scientists working for them and they do good
diets and that so I'd trust what they say and
follow it, but maybe with a little caution, like
not necessarily buying their products ."

Participant 12 (Group 2)

The manner in which the participants went about their searches also highlighted a further issue. Participants were under the impression that the order in which sites appeared in the Google search results was an indicator of the quality of the information found on the sites. This led to participants rarely going beyond the first page of search results.

"Well it's all just rubbish past the first page
isn't it. I mean I don't mean rubbish but like
the top ones are the best ones aren't they?"

Participant 3 (Group 1)

*"To be honest I only really ever look at the
first couple of pages on search results, unless
I am looking for something really specific, like
if I know already exactly what I'm looking for."*

Participant 1 (Group 2)

All participants stated they wanted information that was of a high quality and provided by experts, but in practice often didn't explicitly check to see exactly who had put the information together. Furthermore participants in Group 1 particularly liked websites that offered practical tips and advice such as healthy eating recipes, ideas about how to get children to eat certain foods. They were also keen to hear from 'real people' so forums, or comments from other mothers. There was a feeling that whilst the contributors to these sites may not be experts in an academic sense, they could provide useful advice from firsthand experience, and this in turn provided a type of "expertise". In contrast, participants from Group 2 did tend to focus on information that was scientifically valid, they judged this by the inclusion of references but also by how much the information aligned with their existing knowledge. They wanted to know the 'Whys?' and 'Hows?', such as 'Why should I eat more fruit and vegetables?', 'How do they benefit my health?'.

*"You see, I like this, I've got picky eaters you
see, and it's hard cooking family meals, these
are other mothers with the same problem. Isit's
good to hear the things that have worked."*

Participant 11 (Group 1)

*"I know you can't believe everything you
read on a website, I want to be able to
understand why they are telling me to do
this. I want to see the evidence and evaluate
it for myself, especially if I was considering
changing my behaviour."*

Participant 6 (Group 2)

A further aspect that the participants in Group 1 commented on, in relation to sites that offered advice and comments from other mothers, was the notion this information came from individuals who didn't have an ulterior motive for providing

the information. Participants in Group 2 stated they would only really look at forums and websites with information posted by the general public if they themselves had a specific problem or issue they wanted to discuss with others going through the same thing. This along with the notion that the participants were wary of commercial sites highlights the next theme within the framework.

6.3.2 Trustworthiness and Impartiality

As highlighted earlier, participants tended to prefer public sector or charity websites. Whilst this did relate to them believing that the information was of better quality, it was also linked to a belief that the organisation behind the website was a trustworthy and impartial source. They believed this was particularly important for the participants in the context of getting information for their families in the case of Group 1 and information for themselves for the Group 2 participants.

> *"You can trust them can't you, I mean it's the*
> *NHS. Like the haven't got any other motives*
> *have they? Like when it's stuff for my family*
> *I need to know I can trust the information"*
>
> *Participant 6 (Group 1)*

> *"It's hard to know where to start or who to*
> *trust there is so much information out there.*
> *Most commercial sites have ulterior motives,*
> *with sites like the NHS or BHF they have to*
> *be impartial. I think that is important if*
> *I am thinking about my long term health."*
>
> *Participant 7 (Group 2)*

In addition, whilst there was a preference for non-commercial sites, participants would favour names they recognised to those that they had never heard of even in terms of commercial sites. This often meant that once they had exhausted the non-commercial sites in the first page of search results they would then opt for those that were from commercial brands they recognised. There was a sense that familiarity was linked to trust, in that, if they liked a particular brand or product or organisation then they would be more likely to feel that they were a trustworthy source of information.

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"Like we have Kellogg's cereal at home, and it's always good, and it's quite healthy like Special K and that. I mean it's not the same as the NHS, but you can trust them they've been around for years"

<div align="right">

Participant 1 (Group 1)

</div>

"I guess whilst I know they are trying to sell me their products, I still trust the information about healthy eating. I mean they can't really lie can they, somebody would check it for a big company like Tesco, wouldn't they?"

<div align="right">

Participant 11 (Group 2)

</div>

As before, the positioning of the sites within the Google search results also impacted on the extent the participants felt they could trust the information. The issue highlighted previously, i.e. sites closer to the top of the search results were perceived as more trustworthy.

"Well it's like they are giving you the best ones at the top isn't it… you can sort of trust them more, like more than the ones that on the second or third page of results, I wouldn't look at them"

<div align="right">

Participant 2 (Group 1)

</div>

"Like I do kind of know that the search results are about number of hits or something, but surely if a site is used more than that sort of means that people trust it and find the information valid."

<div align="right">

Participant 5 (Group 2)

</div>

It was also interesting to note that many of the participants, particularly those from Group 1 weren't aware that some of the results Google returned at the top of the list were sponsored links. This may have an impact on their ability to judge how impartial a site is particularly if chosen because it is at the top of the search results and not on the basis that they recognise the organisation. What is more, the participants also commented that the more professional a site looked the more likely they were to trust it. This was highlighted specifically in relation to the inclusion of adverts and pop-ups on certain websites.

> *" It just sort of makes them look a bit dodgy*
> *doesn't it. Like, like well you can't really trust*
> *them, like it's not very professional."*
>
> <div align="right">*Participant 5 (Group 1)*</div>

> *"I think ads make a site look cheap, and if it*
> *looks cheap and unprofessional then I would*
> *assume that the information wasn't the most*
> *reliable."*
>
> <div align="right">*Participant 8 (Group 2)*</div>

This reiterates the importance of the look of a website when participants are making judgments about the trustworthiness and credibility of the site.

6.3.3 Visual Appeal and Credibility of Design

The appearance and layout of the websites has already been highlighted as an important notion in relation to the credibility of the websites. All participants also expressed feeling slightly overwhelmed if there was too much information on the page. Typically they favoured information presented over several pages that they could navigate through by using clearly labeled tabs rather than by scrolling down one long page. They felt that whilst detailed information gave them a sense the material was well researched, participants in Group 1 felt they sometimes struggled to digest the information if overly academic language was used. In fact some participants would leave a site immediately on the basis of that! They had a preference for sites that struck a balance between not being patronising whilst also avoided using overcomplicated language. Participants in Group 2, by contrast, felt reassured by academic language, and believed it brought a sense of reliability to the information.

> *"I wouldn't ever have time to sit there and read*
> *all of that, I don't even understand some of*
> *those words. It's just really off-putting when*
> *you see that little scroll thing on the side go*
> *really small, you know it's going to go on and on."*
>
> <div align="right">*Participant 1 (Group 1)*</div>

*"I think there is a bit too much information
here. It's the sort of thing I would want to
print off and read, my eyes would ache if I
tried to read it on screen. But it sounds
convincing, well researched and not too basic."*

Participant 3 (Group 2)

Participants typically favoured bright colorful websites, but they wanted them to maintain a professional appearance. Participants in Group 1 liked the use of images when there were scenes they could relate to such as pictures of families or women the same age as them. They also liked the inclusion of videos or images in particular when they were looking for recipes or advice. Practical step-by-step instruction accompanied by images helped them to digest the information. They also said it would make it more likely they would try the recipes or tips because they could check they were doing things correctly. Group 2 participants also preferred colourful websites that used pictures but were critical of those that were overly 'fun' or 'cartoon like', viewing them as unprofessional, or not aimed at them.

*" You see I love this site, it's bright and cheerful
…I like the pictures, I like that it's giving you
advice about how to do the things you should
be doing and showing you how to do it…yeah
I'd use this site, I could even use it with the kids."*

Participant 9 (Group 1)

*"I do think they should be colourful, and I like
the pictures, it means it isn't too boring, but
this one looks like it is for children, it's a bit
too fun and playful, it makes me think it isn't
very serious."*

Participant 4 (Group 2)

The points that all participants raised in relation to the visual appeal and the design of the websites related very closely to whether or not they felt the website was aimed at them. Their initial impression of the website was determined a lot by whether or not they felt the website was appropriate for them and if it would provide information relevant to their own personal circumstances.

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6.3.4 Personalisation

One particularly interesting finding was that even though the study instructions specified searching for 'healthy eating advice' all Group 1 participants searched for information within the context of their families and not solely for themselves. In contrast the focus of the search for Group 2 participants was for information that suited their identity as 'students' or at least individuals.

"Well I would be looking for this sort of advice for my family. You know we all need to eat healthily. I want to know about that for the whole family, for my kids mainly."

Participant 4 (Group 1)

"You see a lot of the stuff here is to do with the family, I've just got myself to think about so I'm not really sure this is relevant. I prefer it if I can see how the advice fits into the context of my life, my circumstances."

Participant 12 (Group 2)

They felt strongly that pictures gave an indication of who the sites were aimed at. In some cases the participants in Group 1 disliked the use of images of women that represented an ideal they felt they were unable to achieve. Some also pointed out they weren't looking for information about how to diet to achieve a certain body shape, but were looking for healthy eating advice in general. In addition, participants from Group 2 were turned-off by pictures of families or older adults. These indicated that the information wasn't going to be relevant to them. It appeared that participants in both groups used pictures to make quick judgments about the relevance of websites to themselves and thus it was important they identified with the individuals in the pictures, or the pictures were relevant to healthy eating.

"I mean like, you know, that just puts me right off, a model in a bikini. I've had four kids, I'm never going to look like that! I want to see real women, more like me!"

Participant 12 (Group 1)

> *"You see, I'm guessing this site isn't really going
> to be much use to me, the pictures are all older
> people with kids and that, so that would probably
> put me off looking anymore."*
>
> *Participant 3 (Group 2)*

In this sense, participants from Group 1 also preferred websites they could use with their children feeling they were aimed at mothers. They were also keen on advice for cooking healthy food on a budget, something they reported struggling with.

> *"This is great, you see I could use this with
> the kids. They'd be interested in it as it's
> bright and colorful and has loads of
> interesting ideas. But you know there is stuff
> on here that I could really use as well…you see
> cooking on a budget"*
>
> *Participant 3 (Group 1)*

Participants in Group 2 struggled to find information that was aimed specifically at them, as students. Therefore they tended to focus on more general advice and information, such as information that was not clearly aimed at other specific groups.

> *"It's funny, there are lots of sites that you can
> see straightaway that they are supposed to be
> for parents, or OAPs or kids, but there is noth-
> ing clearly for students……. I thought we were
> known for having bad diets, I guess I thought
> there would be more, even though I've never
> really looked before."*
>
> *Participant 11 (Group 2)*

6.4 Discussion

This study aimed to identify specific aspects of websites that helped to corroborate trust in online healthy eating advice. This is in order for two websites to be developed, one will be aimed at a student sample, whilst the second will be aimed at mothers with low SES, both will be concerned with the links between health and fruit and vegetable consumption. This type of study was particularly useful because

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evidence suggest that to create an effective health message it must be highly relevant to the target groups (Hesketh et al., 2005; Nutbeam, 2000). What is more, when designing an online health message it is essential that the website itself is viewed as credible. Previous research has developed predictive models of website credibility and trust in online health information (Cugelman et al, 2009; Harris et al., 2011). However, credibility is a subjective concept and, therefore, each intervention that looks to target a specific group should ensure it is designed by understanding the views of that specific group.

This study informed the design of an online health intervention by exploring how users perceived existing health information, online. It highlighted the importance of ensuring the health message went beyond just information on the relationship between health and fruit and vegetable consumption, knowledge they typically already had. The participants in Group 1 felt they were more in need of advice that helped them put into action the recommendations. In contrast, participants in Group 2 didn't like to feel patronised by the information on the sites they were interested in information that was evidently corroborated by research. The findings showed that whilst expertise was reported as something they felt was important, participants from both groups often neglected to actively check this. They often took it for granted that certain sites would have experts compiling the information, participants failed to really expand on whom they deemed to be experts. The look of the website contributed to it seeming professional and therefore a website that looked high quality would have good quality information. The look of the website was important, in that, it allowed them to make a quick decision about the appropriateness of the website, quite often participants looked for initial cues about the relevance of websites through the pictures, design and layout of the sites. They liked to feel that the information suited them and their lifestyles, and participants from Group 1 particularly liked sites they could use with their children and families; sites that used images and used bright colors were favored to this end. Participants in Group 2 found it difficult to identify sites that were specifically targeted at them and thus focused on sites that they didn't judge to be specifically aimed at other groups. All participants preferred clearly labeled tabs that helped them navigate quickly to the appropriate information. They disliked long pages of information as they found this daunting and difficult to locate the specific things they were looking for. In

addition, it was also highlighted that participants from Group 1 in particular, sometimes lacked the ability to judge the impartiality of certain organisations, as they weren't always aware that some search results were actually sponsored links.

Previous research has highlighted the notion that including too much information on a webpage can be daunting (Yardley et al., 2010). In addition they demonstrated that participants could be frustrated if too much information repeated what they already knew, however they liked their knowledge to be corroborated. The concept of corroboration was posited by Harris et al. (2011), as an important factor when participants decide to act on health information. These findings are consistent with the present study, as is the notion that participants favoured information that was clearly relevant to them. Yardley et al. (2010) found little evidence that the socioeconomic status of the participants lead to differences in their judgments of the website, however this may have been linked to the health issue their website was addressing. In the present study it appears that whilst socio-economic status didn't directly affect *how* participants made judgments about the credibility of the websites they favoured information that was relevant to their own specific circumstances. This suggests socio-economic status may determine whether of the content is viewed as relevant or personalised. This therefore contributes to how trustworthy and credible the participants deemed the sites to be, as they liked guidance they felt suited their specific circumstances and therefore personalisation and relevance are highly important when considering the content of health messages. In addition the findings offer support for the models (Cugelman et al., 2009; Harris et al., 2011) that were used to guide the framework. Participants, despite being given many opportunities to discuss other potential factors, focused primarily on concepts covered by the models. It also demonstrates the importance of the inclusion of p*ersonalisation* as a factor when the focus of the website is on health information.

This study presents findings from two unique user groups, and utilises a novel method to elicit the views of these individuals. It demonstrates the ways messages need to be tailored in order to be effective with target audiences. Whilst two websites are being developed the main focus of this thesis is low-income families; it is particularly important to address the views of this particular group as they face the largest health inequalities (Nutbeam, 2000). A sample of students was also used

because two websites are being designed to deliver the health message. One suitable for the key target population and one for students who will participate in the testing of the intervention (described in study 5, chapter 8) to ensure a sufficient sample size is achieved (this will be discussed in further detail in chapter 7). The Internet poses a potentially useful means to deliver interventions to low SES families as Internet use within this group is growing (OfNS, 2010). Although this study recruited two different groups of participants from North East England, findings might not be applicable to other types of groups when considering health care provisions and markers of trust. However, it reinforces the need to incorporate the specific views of a target population when designing an online intervention.

6.5 Chapter summary

This chapter described a study designed to identify what constituted a credible health related website. Two groups participated in this study, students and parents with low-SES. An interview guide was developed based around the concepts detailed in two models concerned with website credibility (Cugelman et al., 2009 & Harris et al., 2011). These concepts were also used to focus the analysis of the data. The findings show that there were similarities in the two groups perceptions of what constituted a credible website such as; determining the source was credible and trust worthy; clearly labelled easy to navigate pages; a dislike of too much information on one page; a preference for bullet pointed information; the ability to identify a personal relevance with the site and the information contained on it and a preference for sites that were colourful and used pictures. Both groups also like to read tips and recommendations for how they could incorporate healthier practises into their lives however it was important to both groups that this advice was suitable for their own lifestyles. There were also differences between the two groups perceptions with parents liking sites they thought were aimed at parents and their children, and images used that related to this. Students also liked the use of pictures but preferred pictures they could identify with rather than those of people who they felt weren't like them. Students also showed a preference for information that they could see was backed up by research evidence, where as the parents were put off if terminology was too scientific. A full consideration of how these findings were integrated into the final website presenting the health message is given in the following chapter (chapter 7).

Chapter 7: Developing the website and refining the intervention

This chapter describes how the findings from the previous studies were brought together to design the final intervention. It presents the findings relevant to the modifications to the health message used in Epton and Harris (2008) in order to make it personally relevant to the participants, and addresses specific barriers that have identified in adopting a healthy lifestyle. Furthermore this chapter also presents the findings that inform the design of the website in order to ensure it is visually appealing and that it is as a trustworthy worthy, impartial and expert source. A consideration is also given to improvements made to study design based in the evaluation of the pilot self-affirmation study.

7.1 Introduction

This chapter describes how the findings from studies 1, 2, 3 & 4 (chapters 3,4,5 & 6) have been used to develop the final intervention. The key findings relevant to the development of the intervention are described below, followed by a description of the final intervention. This thesis does not attempt to design a completely novel health message, however it does attempt to refine, or tailor an existing message, taken from Epton and Harris (2008) and make it suitable for a different target population (parents with low SES) and presentation on a website. This involves both identifying aspects of the original message that are already appropriate and considering modifications to the message to enhance its suitability to participants. Chapter 2 described how self-affirming can promote feelings of self-efficacy and response efficacy in relation to fruit and vegetable consumption. However Epton and Harris posit in order for these feelings to be effected by self-affirmation the health message has to address these constructs. In Epton and Harris (2008) participants who self-affirmed rated higher on feelings of self-efficacy and response efficacy than non-affirmed participants. Epton and Harris (2008) suggest the health message presented to participants had to highlight the relationship between health related behaviours and negative health outcomes (response efficacy) and the individuals feelings about their capability to put behaviours into place that will lead to positive health outcomes. Self-efficacy is a subjective belief and therefore messages need to be tailored to the beliefs and circumstances of the target groups.

For the parents, studies 1and 2 (chapters 3 & 4) highlighted barriers that need to be addressed in a health message in order to promote feelings of self-efficacy. Study 4 (chapter 6) also identified the importance of personal relevance when looking at health information online and this further informed the development and design of the website aimed at parents. Furthermore study 4 also highlighted aspects of the message that could be modified to make it more relevant to the additional student sample, this will also be discussed below.

The message, used in Epton and Harris (2008) was developed for use with a student sample and was based on information from government websites, however, it was presented in leaflet form. This had two key implications for this thesis; the message may not be as relevant as it could be to a group of parents with low SES and thus would need to be tailored to them; secondly it meant that as the health message was to be presented on two separate websites (one for parents and one for students) considerations would need to be made about the most appropriate way to present that information, so it appealed to the target audiences and was perceived as credible. It was also decided that in order to avoid confounding the results in the final study the central elements of the message would remain the same.

In terms of the final intervention, it was noted in chapter 5 rather than focussing on both physical activity and fruit and vegetable consumption, the final study would only focus on fruit and vegetable consumption because of concerns over participant recruitment. Therefore the focus here is on the findings from previous studies related to fruit and vegetable consumption. Additionally this chapter also highlights modifications to the study to assess the efficacy of the intervention on the basis of the pilot study.

7.2 Developing the website for mothers of low SES

Studies 1 and 2 (described in chapters 3 & 4) attempted to understand the experience of the target audience, parents with low SES living in the North East of England, of trying to live and adopt a healthy lifestyle. Study three (chapter 6) identified design features for the website, and also pointed to some characteristics of health messages presented on other sites that appealed to the participants, this will also be considered

as they formed part of the process of refining the message. These studies identified key barriers these parents experience in trying to adopt a healthy lifestyle, in terms of their diet and physical activity levels.

7.2.1 Relevant findings from study 1 (chapter 3)

The interviews conducted identified some key barriers perceived by this group to following a health lifestyle. Whilst several themes were identified, not all are relevant to fruit and vegetable consumption, for example the theme of *unsafe local environments* related specifically to physical activity and therefore this is not relevant to a health message concerning fruit and vegetable consumption. Furthermore the theme of *confusion about health messages* is important, the message itself needs to avoid confusion and perhaps offers some clarification on elements of the participants understanding that are unclear, for example portion size. The original message included clear information on portion size so this suggests this element of the existing message can be replicated on the website. However, this theme was primarily concerned with the confusion caused by receiving multiple messages, it is not possible to ensure the message used in this study does not compete or contradict information they have received from other sources. It is only possible to try to ensure the message is consistent with government recommendations and offer some clarity about issues that cause confusion.

The key themes are relevant to inform the development of the health message, targeted at the low SES mothers are *cost, time* and *fussy eaters.* The health message needs to include elements that acknowledge the existence of these barriers in order to promote the relevance the health message has for the mothers. Furthermore the message aims to make recommendations that help these barriers to be overcome. Examples of how these findings were integrated into the message are presented in Table 7.1.

7.2.2 Relevant findings from study 2 (chapter 4)

Chapter 4 presented a Q-sort study to identify barriers that were unique to the target audience. The Q-sort analysis revealed two distinct understanding of mothers with

low SES; Factor B- *It's not hard being healthy on a low income, you've just got to find a way you can afford* and Factor C – *Being on a low income makes it hard to be healthy, we do try, but it's hard!* These two findings are useful to consider when developing the website as they present the views of a group of people with similar socio-economic status but who have different outlooks on how this affects their ability to eat a healthy diet. Participants in Factor B feel that there are economic barriers that hinder their ability to eat healthy whilst participants in Factor C acknowledged those barriers but didn't view them as something that couldn't be overcome. These findings are useful as it may suggest identifying strategies to overcome barriers could help promote self-efficacy. Interestingly the evidence from the interviews and the subsequent Q-sorts identified some particular methods that these mothers already use to increase their families fruit and vegetable consumption, such as hiding vegetables in food but chopping them small or grating them. These are useful tips that will be incorporated into the message. As with all the parents who participated in the Q-sort study, the parents in these factors recognised their responsibility to set a good example. It may be beneficial therefore, to reiterate their position as parent and role model.

7.2.3 Relevant findings from study 4 (chapter 6)

Study 4 identified several important design features for presenting the message online and highlighted some useful findings in terms of the health message. The mothers showed a preference for messages that were relevant to them in their role as a mother. They felt it was important they could identify with the message, so tips and recommendations specifically worded for parents, were preferred to more generic advice. They also didn't feel they needed information about what they should be doing but needed information that guided them as to *how* they could go about eating a healthy diet. This was reflected in their search for recipes, particularly those that were suitable for cooking on a budget. It was not appropriate to include recipes in the refined health message. However providing links to sites where such recipes could be found was something that could be incorporated into the message.

The mothers also preferred websites from organisations they were familiar with. The website developed was not based on source credibility but did adhere to

information from credible sources. The information was based on recommendations from trusted sources such as the NHS and WHO and this was reiterated on the website. Furthermore, the 5-a-day message is one the mothers were familiar with and is also a message they associate with government guidelines, therefore reinforcing this message would help the website appear reputable. It was also appropriate to provide links to sites that the participants were familiar, as they had identified they liked to see information corroborated across sources.

This study also had important implications for the design of the website and the preferences for the presentation of online information. The mothers didn't like too much information presented on one page. They found it daunting and would often leave a page without even reading it if they could see the page length went on and on. They indicated a preference for bullet pointed information that they could digest more easily. The mothers also didn't want to feel like they were being overloaded with information all at once. This suggested that the website needed to present concise information that could be easily navigated with the use of tabs and relevant headings. Whilst they didn't want to feel patronised by the information, they also indicated that they didn't like over complicated academic language. The mothers were interested in the range of benefits of following a healthy diet, beyond those linked directly to physical health, such as the cognitive of psychological benefits. They also liked sites that they thought they could use with their children, leading to a preference for bright colourful websites that presented information that was relevant to the whole family. They showed a strong preference for websites that used pictures, but the findings suggest a preference for images they could identify with, such as those showing families. Examples of how all these findings were integrated into the message are presented in Table 7.1 and screen shots are provided showing the health message and website as presented to the low-LES mothers (7.1-7.7).

Table 7.1 Examples of how these findings were used to tailor the website for mothers with low SES

Finding	Example from the website
Acknowledge the barriers that these mothers may experience	"As a parent it can be hard to ensure you and your family consume enough fruit and vegetables. Time, money and fussy eaters can all make it difficult to get your family eating enough fruit and vegetables."
Identify with the role of the parent and their desire to set a good example	"Don't forget that as a parent it is important that your children see you eating and enjoying fruits and vegetables too! Not only will you see the benefits for your own health, but also you will be setting a positive example to your children."
Include suggestions for how barriers can be overcome	"Grating or blending vegetables into sauces for pasta is a great way of encouraging your family to eat more of them especially if your children don't like chunks of vegetables in their food." "Frozen, canned, and dried fruit and vegetables all count towards 5 A DAY. They're versatile, easy to store and affordable, particularly if you look out for supermarket 'value' ranges or stock up on special offers."
Provide practical tips	"Add extra vegetables to your takeaway, ready meal or homemade dishes. A salad makes a refreshing accompaniment to an Indian meal. If you're having a pizza, add some extra vegetables; 3 tablespoons of mushroom slices, half a pepper or two…."
Provide links to external sites	Links provided to websites for further information such as www.change4life.co.uk, and also to sites where they can find recipes such as, http://allrecipes.co.uk/recipes/tag-145/five-a-day-recipes.aspx
Reiterate the 5-a-day message that they are familiar with	5-a-day message used throughout the site and links to further information on relevant sources provided.
Use bright colours and relevant images	Bright colours used and images depicting families and children used throughout (see screen shots in Figures 7.1-7.7)
Bullet point information	Elements of the message restructured to bullet point form (see screen shots in Figures 7.1-7.7)
Website should be easy to navigate and present information over a series of pages to avoid to much information on a page	See screen shots; message split over a series of pages with clearly labelled tabs to ease navigation.

The following pages provide screen shots of the website designed for parents with low SES.

Figure 7.1 'Homepage' of the website aimed at parents with low-SES

Figure 7.2 'Healthy body' page of the website aimed at parents with low-SES

Figure 7.3 'How it works' page of the website aimed at parents with low-SES

Figure 7.4 'Fruit & veg consumption' page of the website aimed at parents with low-SES

Figure 7.5 'Prevention of diseases' page of the website aimed at parents with low-SES

Figure 7.6 'Recommendations' page of the website aimed at parents with low-SES

Figure 7.7 'Further information' page of the website aimed at parents with low-SES

7.3 Developing the website for students

The health message used in Epton and Harris (2008) was previously tested with a student sample, however it was presented in their study as a leaflet. It was therefore necessary to ensure the message, when presented as a website was appropriate for this group. It is important to remember however the central message that appeared on both the websites remained the same so that the results of the evaluation of the final intervention weren't confounded by differences in the sites. The final message presented to the student sample can be viewed in the screen shots, Figures 7.8-7.14. The findings from study 4 (chapter 6) informed the adaption of the message in the leaflet to make it appropriate for a website. Furthermore some of the findings from this study highlighted some elements of message content that could be modified to suit the preferences outlined by the students.

7.3.1 Relevant findings from study 4 (chapter 6)

Like the mothers, the students had a preference for sites from organisations they were familiar with or contained links to websites from familiar sources. This highlighted the need to ensure it was reiterated on the website that the information was derived from sources such as the Department of Health. The original message had included links to two sites for further information, but because of this finding further links were also included, based on the sites they had shown a preference for. Further to this the students wanted to feel the information came from expert sources and was backed up by research therefore it was important this was made clear on the website. The inclusion of some scientific terminology or references to research evidence was something that should also be included in the message.

There were other similarities in the preferences of the two groups, such as a dislike of too much information on one page, and clearly labelled tabs to aid navigation. They also liked bullet pointed information, saying it was easier to read and disliked pages where they had to scroll down lots of information. They preferred sites that had multiple pages where they could read short sections of information at a time. The students also liked bright colourful sites with pictures, again pictures that

depicted people they could relate too, as this helped to add to feelings about how relevant the site was to them. However, they didn't care for cartoon like images as they felt it discredited the site.

In terms of the message content, the students often felt the information on healthy eating sites wasn't necessarily aimed at their lifestyles. They wanted to feel the recommendations were things they could put into action. During the website credibility study described in chapter 6, some of the student participants commented none of the sites they visited were specifically aimed at them and that information was either generic or aimed at certain groups such as older adults, families or children. They suggested the information would be more meaningful to them if they felt like it was written with students in mind. These findings suggest that by highlighting the website is specifically for students could help them to feel a personal relevance with the information.

The students also responded positively to information about the benefits of eating a healthy diet in terms of their physical health but also the other potential benefits such as improvements to their skin and hair, or the cognitive and psychological benefits. It was important to the students however that these claims were not overly grandiose; otherwise they questioned the validity of the information.

To see how these findings were used to adapt the original health message see Table 7.2.

Table 7.2 Examples of how these findings were used to tailor the website for students

Identify that the website is aimed at students	"As a student it can be hard to ensure you consume enough fruit and vegetables. Time, money and shared cooking facilities eaters can all make it difficult to eat enough fruit and vegetables. "
Acknowledge the studen'ts lifestyle and highlight the variety of benefits of consuming at least 5 portions of fruit and vegetables a day	"Cooking together with your housemates and splitting the cost of shopping can help to ensure you and your friends all get more fruits and vegetables into your diet. By eating more fruits and vegetables as part of a healthy lifestyle you won't just see benefits in your health, research suggests you will have increased energy, have improved concentration and the condition of your skin and hair will also improve."
Provide tips and ideas for getting more fruit and vegetables into their diet that suit the students' lifestyles	"Share the cooking of your evening meals, get together to make stews or pasta dishes that can be bulked out with vegetables as a cheaper alternative to meat." "Frozen, canned, and dried fruit and vegetables all count towards 5 A DAY. They're versatile, easy to store and affordable, particularly if you look out for supermarket 'value' ranges or stock up on special offers."
Provide practical tips	"Add extra vegetables to your takeaway, ready meal or homemade dishes. A salad makes a refreshing accompaniment to an Indian meal. If you're having a pizza, add some extra vegetables; 3 tablespoons of mushroom slices, half a pepper ….."
Provide links to external sites	Links provided to websites for further information such as www.change4life.co.uk, and also to sites where they can find recipes such as, http://allrecipes.co.uk/recipes/tag-145/five-a-day-recipes.aspx
Reiterate the 5-a-day message that they are familiar with	5-a-day message used throughout the site and links to further information on relevant sources provided.
Use bright colours and relevant images but maintain a professional appearance	Bright colours used and images depicting young people. Images are in keeping with a professional site-no cartoon like images used
Bullet point information	Elements of the message restructured to bullet point form (see screen shots in Figures 7.8-7.14)
Website should be easy to navigate and present information over a series of pages to avoid to much information on a page	See screen shots (Figures 7.8-7.14); message split over a series of pages with clearly labelled tabs to ease navigation.

The following pages provide screen shots of the website designed students.

Figure 7.8 'Homepage' of the website aimed at students

Figure 7.9 'Healthy body' page of the website aimed at students

Figure 7.10 'How it works' page of the website aimed at students

Figure 7.11 'Fruit & veg consumption' page of the website aimed at students

Health Information Processing and Personality
When you have looked at all the pages on the website click the 'Finish' button to return to the questionnaire.
The finish button will not be active until you have read all the pages including the read more options.

Finish

5·A·DAY:

HEALTHY BODY | HOW IT WORKS | FRUIT AND VEG CONSUMPTION | FURTHER INFORMATION

Fruit and vegetables can be used to replace foods high in fat and with added sugars

PREVENTION OF CHRONIC DISEASES

- Studies suggest that increasing the amount fruit and vegetables you eat can significantly reduce the risk of many chronic diseases, such as heart disease, stroke and cancer by up to 20%.
- Diet may contribute to the development of one third of all cancers, therefore the second most important thing that can be done to avoid cancer, after reducing smoking, is to increase fruit and vegetable consumption.
- Evidence shows that higher vegetable consumption would reduce the risk of bowel cancer and stomach cancer.
- Eating more fruit and vegetables also decreases the risk of coronary heart disease and stroke. A recent study found that each additional portion of fruit and vegetables a day lowered the risk of coronary heart disease by 4% and the risk of stroke by 6%.
- Evidence also suggests that an increase in fruit and vegetable intake can help lower blood pressure.

PREVENTION OF DISEASES

Studies suggest that increasing the amount fruit and vegetables you eat can significantly reduce the risk of many chronic diseases.

READ MORE...

RECOMMENDATIONS

To receive the beneficial health effects from increased fruit and vegetable consumption, at least 5 different portions of a variety of fruit and vegetables (excluding potatoes and nuts) should be consumed daily.

READ MORE...

5·A·DAY

Figure 7.12 'Prevention of diseases' page of the website aimed at students

Health Information Processing and Personality
When you have looked at all the pages on the website click the 'Finish' button to return to the questionnaire.
The finish button will not be active until you have read all the pages including the read more options.

Finish

5·A·DAY:

HEALTHY BODY | HOW IT WORKS | FRUIT AND VEG CONSUMPTION | FURTHER INFORMATION

Fruit and vegetables
can be used to replace
foods high in fat and
with added sugars

RECOMMENDATIONS

To receive the beneficial health effects from increased fruit and vegetable consumption, at least 5 different portions of a variety of fruit and vegetables (excluding potatoes and nuts) should be consumed daily.

The fruit and vegetables can be fresh, frozen, chilled, canned or dried.

One portion of 80g (3ozs) can be estimated as:

- 3 tablespoons of vegetables
- 2 or more tablespoons of pulses (e.g., beans, lentils).
- 1 cereal bowl of salad
- 1 medium sized fruit (e.g., apple, banana, pear, orange).
- 2 smaller fruits (e.g., plum, Satsuma).
- 1 cup of very small fruits (e.g., berries, grapes).
- 2-3 tablespoons of fresh fruit salad, stewed or canned fruit.
- 1 tablespoon of dried fruit.
- 1 or more glasses of fruit juice.

PREVENTION OF DISEASES

Studies suggest that increasing the amount fruit and vegetables you eat can significantly reduce the risk of many chronic diseases.

READ MORE...

RECOMMENDATIONS

To receive the beneficial health effects from increased fruit and vegetable consumption, at least 5 different portions of a variety of fruit and vegetables (excluding potatoes and nuts) should be consumed daily.

READ MORE...

Figure 7.13 'Recommendations' page of the website aimed at students

Figure 7.14 'Further information' page of the website aimed at students

7.4 Refining assessment of the intervention

The study described in Chapter 5 demonstrated that the self-affirmation technique could be successfully delivered online. However it highlighted that measures of both baseline and outcome behaviours could be improved. The FFQ that was used in the pilot required participants to select from a list the fruits and vegetables they had consumed. However there were problems in identifying at baseline if the participants had consumed more than one portion of the same fruit or vegetable a day. The recommendations are that people should be eating five different portions of fruits and vegetables a day and therefore it was important that this could be identified in the behavioural data. In Epton and Harris (2008) participants completed an interview prior to the start of the study to assess their baseline fruit and vegetable consumption. In this interview they were asked to recall what they had eaten and drunk in the last 24 hours and from this a baseline measure of their fruit and vegetable consumption was calculated. Subsequently post-intervention they were asked to complete a food and drink diary for 7 days. In order to encourage more accurate reporting of fruit and vegetable consumption from the participants it was decided that a measure more akin to that used in Epton and Harris (2008) would be more suitable. Therefore it was decided to use 24-hour recall method to assess baseline fruit and vegetable consumption. 24-hour recall has been shown to be a valid method of dietary assessment when coupled with a question to assess if the previous 24-hours reflected normal dietary behaviours, (Block, 1982). It is important to offer participants the opportunity to give additional information if they felt the previous 24 hours wasn't reflective of their normal dietary intake. Participants will therefore be asked via the online questionnaire to report what they have eaten and drunk in the last 24 hours, and will also be asked to indicate if the past 24 hours differed from normal and if so to provide information on their normal daily dietary intake. They will also be asked to identify within their recall how many portions of fruit and vegetables they have eaten, having been provided with guidance on what constitutes a portion. 24-hour recall can be problematic as it only offers a snapshot of participants' dietary behaviours, however inaccuracies are likely to present across conditions and therefore this shouldn't affect the outcome of the intervention. Furthermore analysis will not measure change in participants' behaviour from baseline, but will treat baseline consumption as a co-variate when

comparing the outcome behaviours in the two groups (experimental and control) thus reducing the effect of inaccuracies in this measure.

In order to assess post manipulation consumption, participants will be asked to log on to a website at approximately the same time each day and record their food and drink intake for that 24-hour period. Once again they will be asked to identify the portions of fruit and vegetables within their dietary consumption for that period. This information will be used to calculate their daily fruit and vegetable consumption for each day. Multiple portions of the same fruit or vegetable within a 24-hour period will not be counted, and the researcher will be blind to the condition of the participants at the time of calculating both their baseline, and post-manipulation daily fruit and vegetable consumption.

7.5 Chapter summary

This chapter has detailed the development of website used in the final intervention to deliver the health message. It described modifications made to the health message used in Epton and Harris (2008) to increase the personal relevance it had to the participants. It showed how for the website aimed at parents, recommendations were incorporated into the message that were appropriate to address the barriers they identified to adopting a health lifestyle. Similar modifications were made to the message aimed at students based in the preferences they identified for information to suit their lifestyles. The chapter explained how findings about the visual appeal of health related websites were used to design websites that would be attractive to the respective target audiences. Furthermore the chapter identified how aspects of the original message from Epton and Harris (2008) were already relevant to the two groups such as providing information about the benefits of fruit and vegetable consumption and showing that the information came from and was corroborated by trusted expert sources. This chapter also detailed improvements that were made to design of the final study by changing the measures used to record baseline and post manipulation fruit and vegetable consumption. The following chapter describes the assessment of the online self-affirmation intervention with the website delivered health message.

Chapter 8: Testing the self-affirmation manipulation online (study 5)

The previous chapters have detailed the development of audience appropriate web-based health messages and the piloting of self-affirmation technique to increase the acceptance of online health information. This chapter details the testing of the final intervention aimed at increasing fruit and vegetable consumption by using self-affirmation technique to increase the acceptance of web-based health information. This study also examines the effects of self-affirmation on feelings of response efficacy and self-efficacy, and on intent to consume 5 or more portions of fruit and vegetables a day. Furthermore this study aims to show that self-affirmation had the greatest effect on individuals who initially consumed the least portions of fruit and vegetables. The study and its findings are detailed below.

8.1 Rationale

This study tested the effects of a self-affirmation manipulation on participants' fruit and vegetable consumption after exposure to the tailored website. The study contained a mixed sample of both low SES mothers and students. The websites the two groups were exposed to contained the same central message, based on that in Epton and Harris (2008) however elements of the websites were tailored to be more personally relevant and appealing to the respective groups as described in chapter 7. As the testing condition is the self-affirmation manipulation the findings are presented for both sets of participants as one sample. Further consideration is also given to the sub-set of low SES mothers.

This study also investigated the effects of self-affirmation on intent, self-efficacy, response efficacy and post manipulation fruit and vegetable consumption. In addition the study also aimed to explore if the effects of self-affirmation are greater in those individuals whose baseline fruit and vegetable consumption is lower. This follows the findings of Armitage et al, (2008) and Harris et al., (2007) as outlined in chapter 2, who have suggested it is individuals whose current behaviour puts them at most risk of the potential negative health outcomes where the effects of self-affirmation are greatest.

It was hypothesised that;

1. Participants who self-affirmed would score significantly higher on measures of intent, change their behaviours and on measures of self-efficacy and response efficacy than non-affirmed participants.

2. Self-affirmed participants would score significantly higher on the self-affirmation manipulation check than those participants in the control group.

3. Fruit and vegetable consumption, would be higher amongst the participants whom had self affirmed as opposed to those in the control group.

4. The effects of self-affirmation on behaviour will be greater in participants with lower baseline fruit and vegetable consumption than those whose consumption is higher at baseline.

8.2 Method

8.2.1 Design

Participants were randomly allocated to either a self-affirmation condition or a control condition, following the principles of a randomized controlled trial (RCT). Following this intervention, all participants were exposed to the website containing the health message. Fruit and vegetable consumption was measured at baseline prior to allocation. Self-efficacy, response efficacy and intention to change were measured immediately after exposure to the health message and participants were then given a 7-day diary to assess subsequent fruit and vegetable consumption. A manipulation check was also included to ascertain weather participants in the experimental condition had self-affirmed.

8.2.2 Participants

A purposeful sample of eighty-five participants was consisting of university students and mothers of low SES. The low SES mothers were and were recruited through Sunderland Children's Centres and reimbursed for their time with a £5 shopping voucher. This was agreed as a suitable means so as not to interfere with any benefits they were receiving. The university students were recruited through the

Department's research participation pool and took part in exchange for course credits.

8.2.3 Materials

An online questionnaire was designed to deliver the measures and study information to the participants. The websites presenting the health message concerning fruit and vegetable consumption have been detailed in the previous chapter (chapter 7). The websites presenting the health message and the online questionnaire were developed to be distinctly different and appropriately designed for each target group. Also to support the notion this single study was actually a series of unrelated studies as in Epton and Harris (2008). The additional measures were all adapted from Epton and Harris (2008) with the exception of the baseline and post-manipulation fruit and vegetable consumption were measured using the 24 hour recall method as described in chapter 7.

8.2.3.1 Baseline measures

Fruit and vegetable consumption: Baseline measures were taken of current fruit and vegetable consumption. The online questionnaire, developed in consultation with a qualified nutritionist, asked participants to record their dietary intake, both food and drink, for the last 24 hours. They were asked to identify any elements of their intake that constituted a portion of either fruit or vegetables. To facilitate this participants were also provided with guidance as to what constituted a portion of fruit or vegetables based on the premise that one portion is approximately 80g. Furthermore participants were also asked if for any reason their dietary intake in the previous 24 hours had differed from normal and if so to indicate a typical day's food and drink. 2 participants said the previous 24 hours had not been representative, both saying they had been unwell and therefore had eaten very little, they provided information on a typical day's intake. This data was used to calculate the participants' average daily fruit and vegetable consumption and/or physical activity levels per day. When calculating this, the researcher was blind to the condition the participant was assigned to.

Readiness to Change: This was gauged via an adapted measure from Laforge, et al. (1994) as used in Epton and Harris (2008). A series of 5 questions requiring a Yes/No answer allowed participants to be categorised in one of the following six stages of change; Pre-contemplation, Contemplation, Preparation, Action, Maintenance or Maintenance of a long running behaviour, each stage was coded (1-6) to facilitate the generation of mean readiness to change scores across the behaviours. This was important to ensure both groups were at an equal stage in adopting or maintain behaviours conducive to good health.

8.2.3.2 Intervention

The self-affirmation manipulation developed by Reed and Aspinwall (1998) posed a series of questions such as; *"Have you ever forgiven another person when they hurt you".* When participants gave a 'yes' answer they were asked to type an account of this experience.

The personal opinion questions used as the control group task were also taken from Reed and Aspinwall (1998). This involved a series of questions designed to follow the same format as the self-affirmation questions but to elicit only the participants' opinions on a range of arbitrary subjects. *"I think chocolate is the best flavour of ice cream".* When answering 'yes' they were asked to explain why.

Copies of the full self-affirmation manipulation questions and the control task questions can be found in Appendices 10.8 & 10.9.

8.2.3.3 The websites presenting the health message

The websites were developed as detailed in the previous chapters however the central message was based on that used in Epton and Harris (2008) which was based on information from government websites relating to eating 'five a day'.

8.2.3.4 Post-manipulation Measures

Intention was, as in Epton and Harris (2008), measured by two questions; *"Do you intend to eat at least 5 portions of fruit and vegetables each day in the next seven days"* and *"I intend to eat at least 5 portions of fruit and vegetables each day over the next seven days"*. Responses were measured on a 7-point scale (Cronbach's α = .93).

Self-efficacy was measured using a 4 item questionnaire Epton and Harris (2008) adapted from Fuchs et al. (1993). Responses to items such as "I know for sure I could adhere to eating at least five portions of fruit and vegetables a day." and "I doubt I could manage to eat at least 5 portions of fruit and vegetables a day" were given on a four point scale ranging from 1 (not true at all), 2 (barely true), 3 (moderately true) to 4 (exactly true). Cronbach's α = .78. See Appendix 10.10

Response-efficacy was measured using six items taken from Epton and Harris (2008). For example, "Eating five portions of fruit and vegetables a day will reduce my risk of heart disease and some cancers" and "Eating at least five portions of fruit and vegetables a day will improve my health by boosting my immune system". Responses were given on a 7 point scale from agree to strongly disagree, Cronbach's α = .70. See Appendix 10.10

Word recall task: As a guise a word recall task was also included to distract participants from the true purpose of the study. Participants were presented with a series of words and had to say whether or not they had appeared in the health information.

Manipulation Check: A manipulation check (Napper et al., 2009) was included to ensure participants in the experimental condition had self-affirmed. This is designed to tap into what the participants were thinking about themselves when they were completing the self-affirmation task or the control task. This check also demonstrated the self affirmation task had prompted the participants to think more positively about themselves than those participants in the control group, Napper et al.

(2009) propose that this demonstrates participants had engaged in the task appropriately and had therefore, self-affirmed. See Appendix 10.11. This check included two additional questions than that used in the pilot study. The scales for responses to these questions differed and thus z scores were calculated to compute final manipulation check scores.

Post-manipulation behaviour measure: Participants received a unique computer generated user ID code during the study and this was also sent to them automatically by e-mail to preserve their anonymity. They were instructed to log on to a website every day and complete a diary of their food and drink intake for each 24 hour period, for the next seven days.

8.2.4 Procedure

Student participants were asked to attend a testing session within the University; they were informed that this would last around 30 minutes, and a further 30 minutes of the participants' time would be required by spending approximately 4-5 minutes a day for the next seven day completing a brief online questionnaire. There received course credits for their participation. Testing sessions were arranged at Sunderland Children's Centres for the low SES mothers. A quiet room was provided within the Children's Centre. It was ascertained prior to testing that all participants had access to the Internet at home. Participants were informed that they were taking part in a series of studies looking at the communication of health information online, personality and beliefs. Consent and briefing information was delivered via the online questionnaire, and on consenting to participate, participants received a unique participant number and randomly assigned to either the experimental or control condition. They completed the baseline fruit and vegetable consumption and readiness to change measures. Following this, the participants either completed the self-affirmation manipulation or the control task. On completing these measures the online questionnaire redirected the participants to the relevant website. The website was designed so that participants had to read each page on the site before they could return to the online questionnaire. Once they had read the information on the website the participants returned to the online questionnaire and worked their way through the series of post manipulation measures. On completing, participants were

told they would receive an e-mail later that day containing a link to another website. They were asked to log on to this daily for seven days to complete a diary of their food and drink intake each day. Participants also received daily e-mail reminders to log on and complete this measure. On completion of the seven-day diary participants were redirected to another web page where they were presented with debriefing information.

8.3 Results

Complete data was available for 72 (n=72) of the participants. This consisted of 48 undergraduate psychology students with a mean age was 21.6 years (SD 3.2 years) and 24 low SES mothers with a Mean age 32.4 years (SD 6.3 years). See table 8.1 for the distribution of the groups across conditions.

Table 8.1 Distribution of the two groups of participants across the testing conditions

Participants	Self-affirmed (SA)	Non-affirmed (NA)
Low SES mothers	11	13
Students	22	26
Total	33	39

The results are initially presented based on the analysis of the entire sample. Following that a consideration is given to the analysis of the data from the primary target population mothers with low SES (main SPSS output can be found in Appendix 10.15).

8.3.1 All participants

8.3.1.2 Randomisation to condition and manipulation check

To test for any potential baseline differences between conditions, one-way ANOVAs were conducted for state of change, the manipulation check and fruit and vegetable consumption. Participants in the experimental (self-affirmed) and control (non-affirmed) conditions did not differ significantly in their baseline stage of change, F

(1, 70) = 0.713, p = .401 or in their baseline fruit and vegetable consumption, F (1, 70) = 2.604, p = .111. This suggests randomisation to condition was successful (see Table 8.2 for descriptive statistics). The manipulation check scores revealed a significant difference between groups, F (1, 70) = 85.969, p <0.001. This suggests participants in the experimental condition had self-affirmed (see table 8.2 for descriptive statistics).

Table 8.2 Descriptive statistics of baseline behaviour measures and manipulation check (z scores) between the conditions

Participants	Baseline fruit and vegetable consumption		Readiness to change		Manipulation check scores (z scores)	
	SA Mean (SD)	NA Mean (SD)	SA Mean (SD)	NA Mean (SD)	SA Mean (SD)	NA Mean (SD)
	2.52 (1.46)	3.10 (1.60)	3.12 (1.60)	3.46 (1.79)	.5862 (.51)	-.496 (.48)

8.3.1.2 Effects of self-affirmation on behaviour

To determine the effects of self-affirmation on post-manipulation behaviour, the analyses followed that used in Epton and Harris (2008). The analysis was conducted was a mixed 2 x 7 analysis of co-variance (ANCOVA), with condition (self-affirmed or non-affirmed) as the between subjects variable (seven days), and baseline consumption as the co-variate (to control for differences in levels of fruit and vegetable consumption at baseline). The analysis revealed a significant and large main effect of condition on behaviour F (1, 69) = 49.466, p < .001, η_p^2 = .418. Figure 8.1 illustrates self-affirmed participants reported consuming significantly more fruit and vegetables than non-affirmed participants (SA mean = 3.96, NA mean = 2.81). The main effect of condition was not qualified by a significant interaction with day F (6,64) = 1.700, p = .135, demonstrating the effect of condition was consistent across the seven days. There was no significant main effect of day overall, F (6, 64) = 1.114, p = .364.
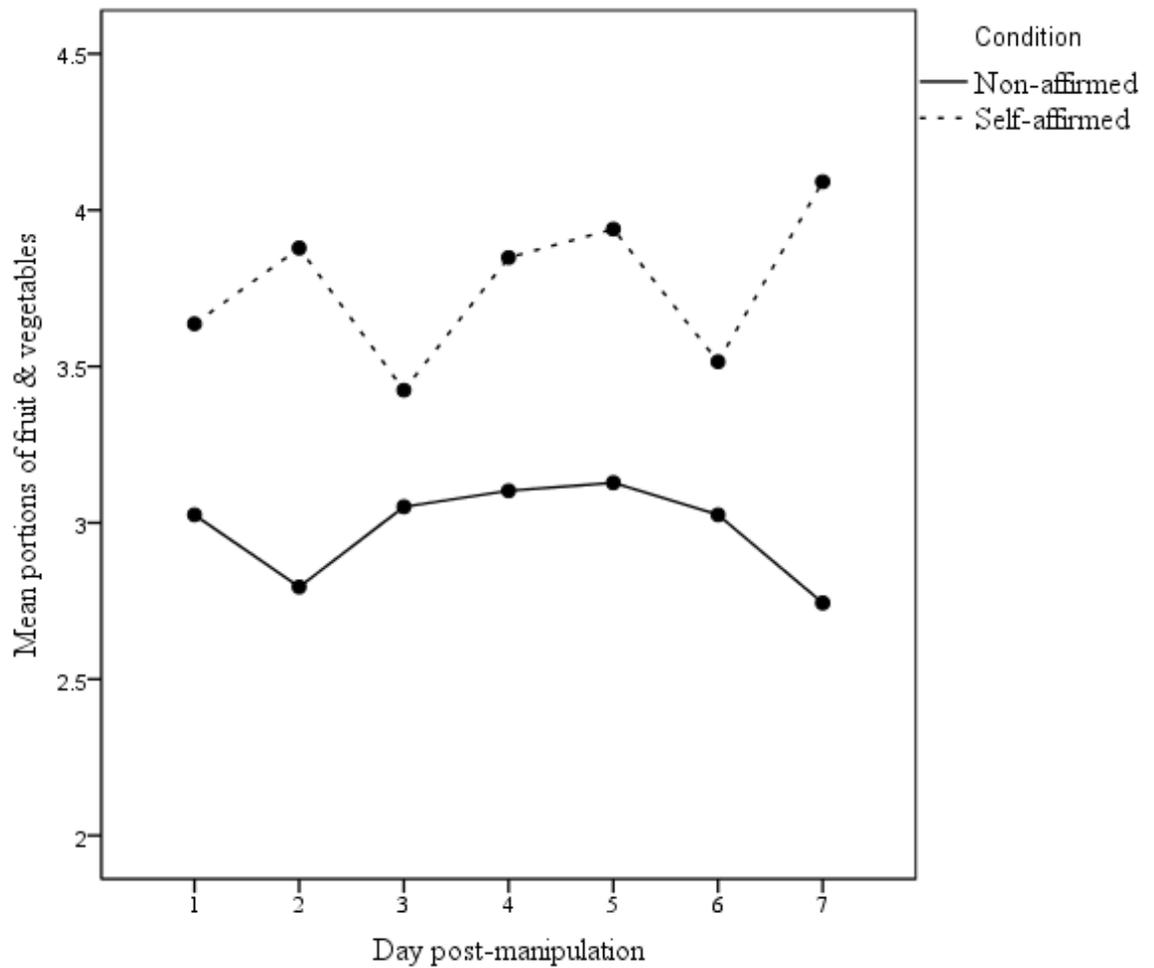
Figure 8.1 Reported fruit and vegetable consumption in the 7 days post manipulation by condition

8.3.1.3 Effects of self-affirmation on the other dependent measures

One-way between participants ANOVAs were run to test for effects of condition on the other dependent variables; intent, self-efficacy and response efficacy (see Table 8.3 for descriptive statistics). Self affirmed participants reported significantly higher intent, $F (1, 70) = 141.562$, $p < .001$, and self-efficacy, $F (1, 70) = 5.799$, $p = .019$. The effect of condition on response efficacy approached significance, $F (1, 70) = 3.936$, $p = .051$.

Table 8.3 Mean (and standard deviations) of post manipulation dependent measures for both self-affirmed (SA) and non-affirmed (NA) participants

Measure	Participants	
	SA Mean (SD)	NA Mean (SD)
Intent	5.77 (.67)	4.13 (.50)
Response Efficacy	5.35 (.68)	4.96 (.93)
Self-Efficacy	2.73 (.43)	2.49 (.44)

In light of these findings it was appropriate to assess if any of the dependent variables mediated the effects of self-affirmation. Baron and Kenny (1986) suggest mediation can only exist if three conditions are met; firstly, the condition (self-affirmed or non affirmed in this case) and mediator variables (intent, self-efficacy and response-efficacy) must be significantly related, secondly, the condition variable and dependent measure (in this case post manipulation fruit and vegetable consumption) must be significantly related and finally, the mediator variables and the dependent measure are significantly related when controlling for condition. In this case all of these conditions also have to be met whilst controlling for baseline fruit and vegetable consumption, as in Epton and Harris (2008). To test if these conditions were met in this instance multiple regression analyses were conducted. Analysis revealed the mediator variables and condition were all significantly related; intent; $B = 1.651$, $SE = .142$, $p < .001$, self-efficacy; $B = .263$, $SE = .105$, $p = .015$ and response efficacy; $B = .442$, $SE = .105$, $p = .028$. Condition (self-affirmed or non-affirmed) and the dependent variable (post manipulation fruit and vegetable consumption) were also significantly related, $B = 1.145$, $SE = .163$, $p < .001$. However the final regression analysis revealed the mediator variables were not significantly related to the dependent variable while controlling for condition; intent, $B = -.002$, $SE = .140$, $p = .987$, self-efficacy, $B = .236$, $SE = .189$, $p = .218$ and response efficacy, $B = .031$, $SE = .101$, $p = .759$. As the paths between the mediator variables and the dependent variable are not significant it was not appropriate to proceed with full mediation analysis.

8.3.1.4 The effects of self-affirmation on consumption level at baseline

Given the observed effect of condition on post manipulation fruit and vegetable consumption it was also appropriate to explore the prediction that self-affirmation would lead to a greater increase in fruit and vegetable consumption amongst individuals with lower baseline consumption. To explore this, the participants' baseline fruit and vegetable consumption was categorised as either high or low using a median split (see Table 8.4).

Table 8.4 Distribution of participants across participants across condition by low/high baseline consumption and high/low post manipulation consumption

Participants	N	Mean fruit and vegetable consumption at baseline (SD)	Mean fruit and vegetable consumption post-manipulation (SD)
SA Low	19	1.53 (.70)	3.38 (.65)
SA High	14	3.86 (1.10)	4.28 (.90)
NA Low	15	1.47 (.74)	1.73 (.86)
NA High	24	4.13 (1.04)	3.76 (1.02)

A 2 (low baseline vs. high baseline, referred to as consumption level) x 2 (self-affirmed vs. non-affirmed, referred to as condition) x 2 (baseline consumption vs. post-manipulation consumption, referred to as pre/post consumption) mixed design analysis of variance (ANOVA) was conducted. The analysis revealed a main effect of condition, as reported in the previous analysis $F_{(1, 68)} = 6.19$, $p = .015$. A significant increase in fruit and vegetable consumption from baseline to post manipulation consumption was also observed $F_{(1, 68)} = 39.706$, $p < .001$. There was also a main effect of consumption level on post manipulation consumption, $F = (1, 68) = 101.261$, $p < .001$. As these effects are collapsed across conditions it is of greater interest to look at the higher-level interactions. A significant interaction was observed for consumption level and condition, $F_{(1, 86)} = 47.045$, $p < .001$, as was

for pre/post consumption and consumption level, $F_{(1, 68)} = 35.780$, $p < .001$. An interaction approaching significance was observed for condition and consumption level, $F_{(1,68)} = 3.470$, $p = .067$. However all of the above effects are qualified by a significant three-way interaction between; pre/post consumption, condition and consumption level, $F_{(1,68)} = 5.473$, $p = .022$. See Figures 8.2 and 8.3 for an illustration of the direction of these effects in both conditions.
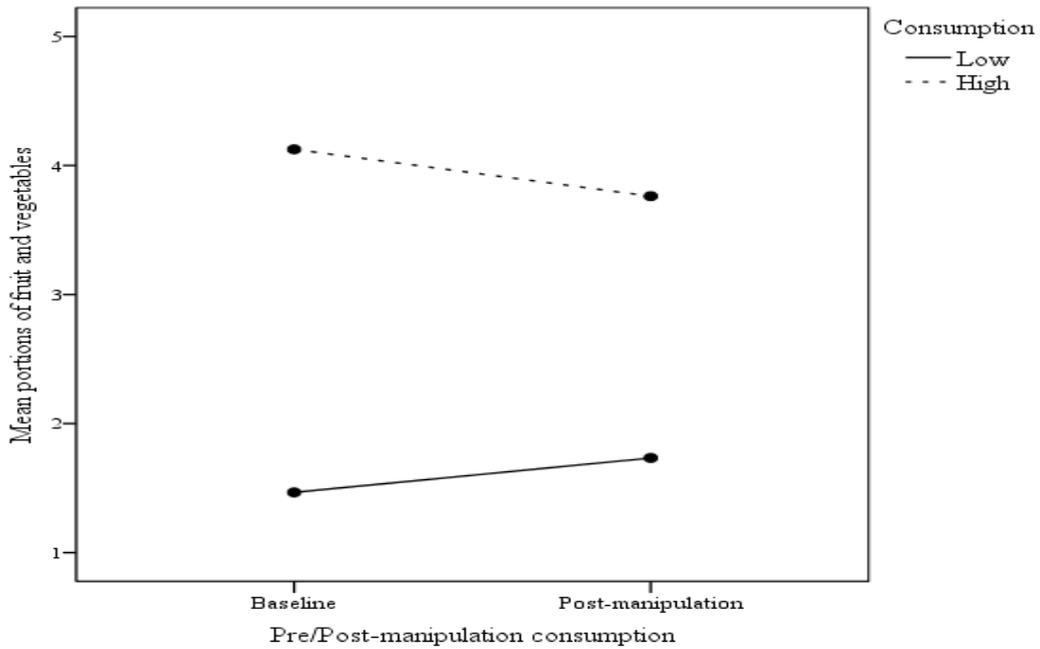
Figure 8.2 Low/High baseline vs. post-manipulation consumption in non-affirmed participants
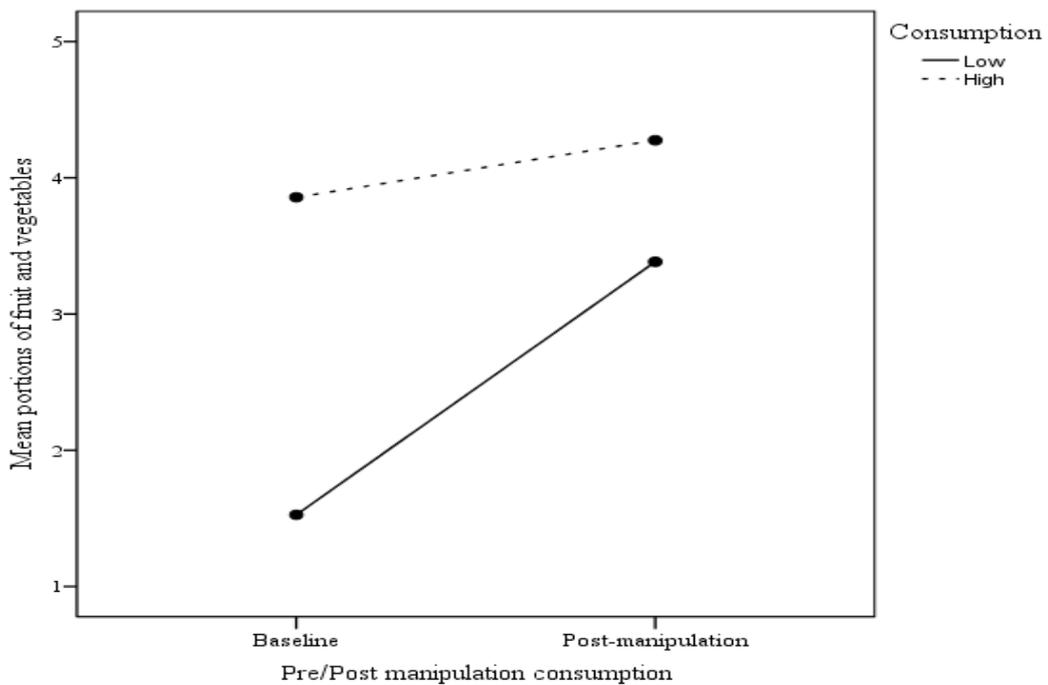
Figure 8.3 Low/High baseline vs. post-manipulation consumption in self-affirmed participants

This effect was further analysed by running two 2x2 mixed ANOVAs, one for each condition; self affirmed and non-affirmed. The analysis showed that for non-affirmed participants there was no significant increase in fruit and vegetable consumption from baseline F = (1, 37) = .174, p = .679. The median split lead to a significant difference between low and high non-affirmed participants fruit and vegetable consumption, F (1, 37) = 66.653, p < .001 as would be expected. Interestingly there was also a significant interaction between pre/post consumption and consumption level, F (1, 37) = 7.427, p = .010. This reflects a slight increase in the vegetable consumption of non-affirmed participants who were low consumers at baseline, and a slight decrease in consumption for non-affirmed participants who were high consumers at baseline. This very slight effect is illustrated in Figure 8.2 above, and is possibly best explained by regression to the mean. It may also be that this is an effect of simply being exposed to the health message.

For self-affirmed participants there was a significant increase in fruit and vegetable consumption from baseline F (1, 31) = 77.229, p < .001, and as expected due to the median split there was a significant difference between low consumption and high consumption in self affirmed participants, F (1, 31) = 38.062, p < .001. There was also a highly significant interaction between pre/post consumption and consumption level as clearly illustrated in Figure 8.3, F (1, 31) = 30.875, p < .001. The three-way interaction effect described above is caused by the very large interaction effect observed here which is barely present in the non-affirmed participants. The increase in fruit and vegetable consumption for self-affirmed participants who were low consumers of fruit and vegetables at baseline is much greater than for any other group. This suggests that self-affirmation has its greatest effect in increasing fruit and vegetable consumption in those who are initially consuming the least.

8.3.2 Low SES mothers – the target group

As the primary target group of this intervention were mothers with low SES it is appropriate to consider the available data for this group separately. This will be done in terms of the first 3 hypotheses, with insufficient data available to address the final hypothesis.

8.3.2.1 Randomisation to condition and manipulation check in Low SES mothers

The ANOVA revealed low SES mothers in the experimental (self-affirmed) and control (non-affirmed) conditions did not differ significantly in their baseline stage of change, $F_{(1,22)} = .1.231$, $p = .279$ or in their baseline fruit and vegetable consumption, $F_{(1,22)} = 2.729$, $p = .113$. This suggests that randomisation to condition was successful (see Table 8.5 for descriptive statistics). The manipulation check scores revealed a significant difference between groups, $F_{(1,22)} = 37.668$, $p <0.001$. This suggests the low SES mothers in the experimental condition had self-affirmed (see table 8.5 for descriptive statistics).

Table 8.5 Descriptive statistics of baseline behaviour measures and manipulation check (z scores) between the conditions

	Baseline fruit and vegetable consumption		Readiness to change		Manipulation check scores (z scores)	
Low SES mothers	SA Mean (SD)	NA Mean (SD)	SA Mean (SD)	NA Mean (SD)	SA Mean (SD)	NA Mean (SD)
	2.00 (.78)	2.92 (1.71)	2.73 (1.10)	3.46 (1.94)	.5369 (.48)	-.5255(.36)

8.3.2.2 Effects of self-affirmation on behaviour in Low SES mothers

Following the analysis outlined in section 8.3.1.2 above, a significant main effect of condition on behaviour was revealed $F_{(1, 21)} = 19.170$, $p < .001$. Figure 8.1 illustrates self-affirmed low SES mothers reported consuming significantly more fruit and vegetables than non-affirmed participants (SA mean = 3.98, NA mean = 2.79). In this case there was a significant interaction with day $F_{(6, 126)} = 2.539$, $p = .024$, suggesting that there were inconsistencies in this effect across the seven days. However there was no significant main effect of day overall, $F_{(6, 126)} = 1.685$, $p =$

.130. Figure 8.4 illustrates this effect over the seven days, and suggests that self-affirmed participants consumption was maintained at a relatively consistent level over the seven days, but the non-affirmed participants consumption fluctuated, which will have lead to the significant interaction effect; this will be considered in the discussion.
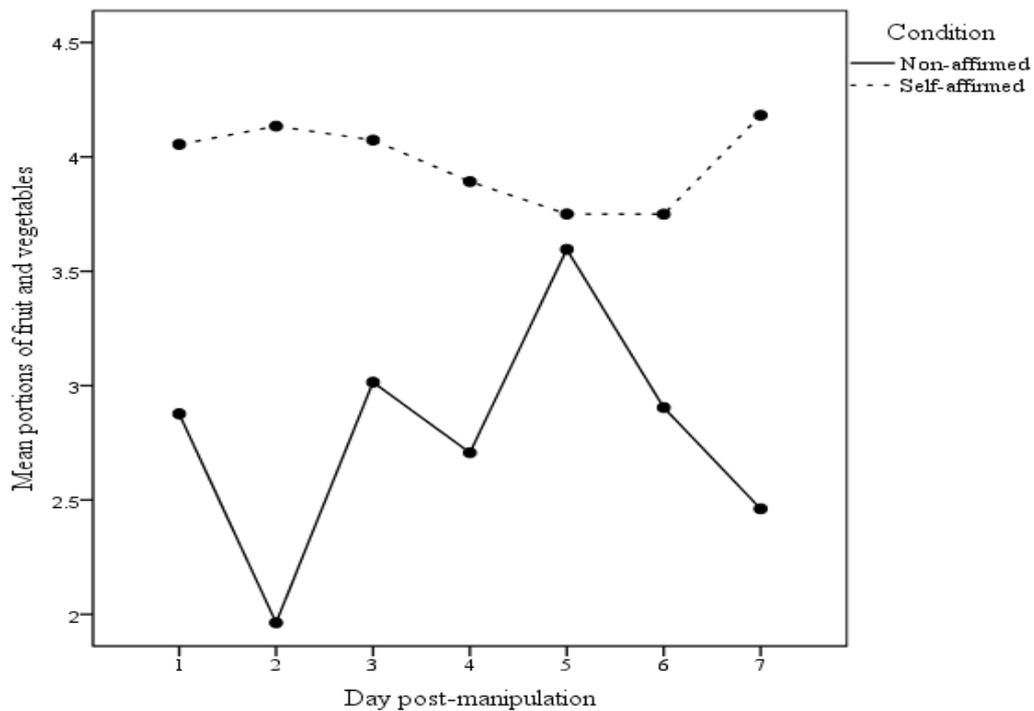
Figure 8.4 Reported fruit and vegetable consumption in the 7 days post manipulation by condition

8.3.2.3 Effects of self-affirmation on the other dependent measures in low SES mothers

One-way between participants ANOVAs were run to test for effects of condition on the other dependent variables; intent, self-efficacy and response efficacy (see Table 8.4 for descriptive statistics). Self affirmed low SES mothers reported significantly higher intent, $F (1, 22) = 22.577$, $p < .001$. The effect of condition on self-efficacy, $F (1, 22) = .174$, $p = .681$ and response efficacy $F (1, 22) = .303$, $p = .588$ was not significant in this sub-set of the sample. Table 8.6 displays the descriptive statistics for these measures. It is worth noting that whilst the differences in self-efficacy and response efficacy scores weren't significant, the means reveal slightly higher scores for self-affirmed participants than non-affirmed participants.

Table 8.6 Mean (and standard deviations) of post manipulation dependent measures for both self-affirmed (SA) and non-affirmed (NA) low SES mothers

Measure	Low SES mothers	
	SA Mean (SD)	NA Mean (SD)
Intent	5.55 (.76)	4.23 (.59)
Response Efficacy	5.32 (.734)	5.18 (.43)
Self-Efficacy	2.55 (.33)	2.48 (.41)

8.4 Discussion

8.4.1 Findings from all participants

Self-affirmed participants reported a higher consumption of fruit and vegetables than their non-affirmed counterparts, in the 7 days following the experimental manipulation. This effect was consistent over the seven days and therefore was not moderated by time. Self-affirmed participants reported eating on average nearly four portions of fruit and vegetables a day whilst the average consumption of non-affirmed participants was less than 3 portions a day. This equates to self-affirmed participants consuming on average over 8 more portions of fruit and vegetables a week, which is more than one extra portion a day. This seemingly small difference has important health implications, given research has highlighted beneficial effects to health if an increase of one portion a day is achieved (Epton and Harris, 2008). This is the first study to show that self-affirming online can promote message acceptance leading to a behaviour change when participants have been exposed to a web-based health message. This study also supports the findings of Epton and Harris (2008) who showed an increase in fruit and vegetable consumption in self-affirmed participants who had been shown an offline health message.

Furthermore this study demonstrated that participants whose baseline consumption was low (2.5 or less portions a day) benefitted most from the self-affirmation

manipulation as they showed the greatest increase in their behaviour. This supports the findings of Armitage et al. (2008) and Harris et al. (2007) who had found similar effects in terms of message acceptance but adds to the literature, as this effect has not been previously observed in terms of actual behaviour change. This is particularly important as, individuals whose current behaviour puts them most at risk, can be the hardest to persuade to change their behaviour (Weinstein, 1988; Croyle, Sun & Hart, 1997; Lieberman & Chaiken, 1992; Kunda, 1987). It is particularly interesting that this hard to change group can be targeted by an online intervention successfully, as this has important implications for potential low-cost high impact interventions.

Like previous research (Harris & Napper, 2005, Armitage et al., 2008), this study found that self-affirming promoted intentions to engage in behaviour, a key step highlighted by behaviour change models in the behaviour change process. Further support is also shown here for the notion that self-affirmation promotes feelings of self-efficacy, and some tentative support that it promotes feelings of response efficacy. This study did not meet the conditions to conduct a mediation analysis to explore if these variables mediated the effect of self-affirmation on behaviour. However the research in this thesis is not focused on investigating the processes by which self-affirmation works. This highlights the need for further research to identify more clearly the process at work in self-affirmation. These findings, and especially the implications, will be considered in more detail in Chapter 9.

8.4.2 Findings from low SES mothers

The data from the low SES mothers demonstrated a behaviour change consistent with that observed for the whole group. This is an extremely positive finding and suggests that this technique has the potential to effect a change in a group who are at high risk of the negative health outcomes associated with low fruit and vegetable consumption. This subset of participants demonstrated a difference in weekly consumption almost identical to that described above, once again with self-affirmed participants consuming on average over 8 portions more a week than their non-affirmed counterparts. Whilst there was some evidence in this sample that the difference between the two groups was not maintained on each of the 7 days, there was no overall effect of day showing once again that the effect of self-affirmation on

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fruit and vegetable consumption was maintained over the whole week. It is likely that the small sample size highlights these fluctuations in daily consumption that were observed in the non-affirmed participants and that in a larger sample, as described above these fluctuations are less obvious.

Of particular importance to this thesis, this study shows presenting health information to this group via a tailored website coupled with a self-affirmation manipulation has the potential to lead to a measurable change in behaviour. This supports the notion that the Internet provides a valuable means to intervene with this group.

Interestingly whilst self-affirmation was shown to have a positive effect on intentions that same effect was not observed for feelings of response or self-efficacy, although trends were evident in the data suggesting these feelings were slightly higher in self-affirmed participants that non-affirmed. It may be that the sample size of this sub-set was too small to observe any effect of self-affirmation on these variables. Further consideration will be given to all these findings in chapter 9.

8.5 Chapter summary

This chapter has detailed the testing of the final intervention designed to investigate if self-affirmed participants consumed more fruit and vegetables in the week following the intervention, on the recommendation of a web-based health message. The findings showed that self-affirmed participants did consume more portions of fruit and vegetables in the 7 days post intervention than their non-affirmed participants. The findings also showed that self-affirming increased intent to consume 5 or more portions of fruit and vegetables, lead to greater feelings of self-efficacy and tentatively suggested it lead higher ratings of response-efficacy when comparing against individuals who had not self-affirmed. This is the first study to demonstrate the effects of self-affirmation on behaviour in relation to a web-based health message. This study also demonstrated that the effects of self-affirmation were greatest in individuals who had the lowest baseline consumption; this is the first self-affirmation study to demonstrate this effect in relation to actual behaviour change. The following chapter will give greater consideration to these findings in

the context of existing literature and the implication of these findings for future research.

Chapter 9: Discussion

This discussion considers the findings from the five research chapters reported in this thesis, and highlights the main contributions from each, in terms of the development and testing of a successful behaviour change intervention. The work is summarised in terms of the research aims and objectives: firstly, the identification of barriers to adopting healthy lifestyle behaviours, experienced by parents with low SES; secondly, the development and tailoring of the website used to present a health message and thirdly the testing of self-affirmation as a technique to increase message acceptance and induce a change in behaviour. This discussion will reflect on the literature discussed in chapters 1 and 2, and will consider how the work presented in this thesis has contributed to our knowledge of self-affirmation manipulations and their use in web-based behaviour change interventions. The implications of these findings will be discussed both in terms of the intervention and in the wider context. Limitations of this research and suggestions for future work will also be presented.

9.1 Research aims

The purpose of this research was to develop a successful online intervention to improve health related behaviours, specifically fruit and vegetable consumption. This involved working with the target audience so their views could be used to design an intervention that was suitable and appropriate to their circumstances.

The specific objectives were to:

- Examine parents' attitudes and experiences in terms of incorporating healthy practices such as eating a healthy diet and engaging in physical activity into family life.
- Explore the barriers they identify in more detail and to consider them in relation to parents with non-low SES.
- Demonstrate the effect these barriers have whilst also identifying potential strategies parents themselves articulate to avoid or overcome these barriers.

- Understand how and what is viewed as credible online health information so that a website can be developed to suitably present a health message, tailored on the basis of the above findings.
- Ascertain if self-affirmation manipulations are a suitable technique to use in an online environment.
- Develop an online programme to deliver the self-affirmation manipulation alongside the tailored website.

These objectives were incorporated into three main research questions:

1. What are the barriers experienced by parents with low-SES to adopting healthy lifestyle behaviours, specifically eating a healthy diet and engaging in physical activity?
2. What constitutes a credible health related website in the eyes of parents with low SES and University students?
3. Can self-affirming online increase the acceptance of a web-based health message and lead to a measurable change in behaviour?

The first research question aimed to build on the sparse existing knowledge about the experiences of this specific group, parents with low-SES living in the North East of England, in terms of their health related behaviours. Previous research had identified barriers such as cost, time and motivation (Andajani-Sutjahjo et al., 2004) and the importance of providing information that was clear and not contradictory (Gettleman & Wickleby, 2000). However the extent to which parents with low SES living in the North East of England experienced these barriers in their everyday lives had not been explored previously. Furthermore this question aimed to identify the extent to which technology was being used in these parents' lives to provide an indication of the suitability of an online intervention for this group. The purpose of investigating this was to inform the tailoring of an existing health message so it was appropriate to parents with low SES.

The second research question aimed to investigate what constituted a credible health advice website. This was deemed as an important step in ensuring the credibility of

the health information when it was presented on a website as opposed to in leaflet form. Previous research (Cugelman et al., 2009 & Harris et al., 2011) had developed models indicating the components that led to trust in online health advice. However these models state that the components are determined by the perceptions of the target audience. Thus it is essential that the target audience are involved in the development of health advice websites so their perceptions and preferences can be incorporated into site design.

The third research question aimed to replicate the findings of Epton and Harris (2008). They had shown that self-affirmed participants consumed more portions of fruits and vegetables in the week post-intervention than non-affirmed participants on the basis of recommendations contained in a health message based on government guidelines. The aim of this thesis was to replicate this in an online environment presenting the health message on a tailored website. Furthermore this thesis aimed to demonstrate that the effects of self-affirmation would be greatest in individuals who consumed the fewest portions of fruit and vegetables at baseline. Previous research (Armitage et al., 2008; Harris et al., 2007) had demonstrated that self-affirmed individuals whose behaviour deviated most from what was recommended had higher intentions to change their behaviour than self-affirmed participants whose baseline behaviour was closer to that which is recommended. This thesis aimed to demonstrate the same effect in terms of actual behaviour.

In order to answer the first research question interviews were conducted to understand the day-to day experiences of parents with low SES with a particular focus on diet, exercise and technology use. Using thematic analysis barriers were identified that inhibited these parents adopting healthy lifestyles. Further analysis was conducted to both verify and further explore these barriers further, identifying those that were particularly salient to parents with low SES. To understand what constituted a credible health related website framework analysis was conducted on interview data, focusing on aspects highlighted by models of website credibility. In order to assess the suitability of self-affirmation technique in an online setting, with web-based health information a pilot study was conducted. Following this, and in conjunction with the findings from the qualitative studies to develop an appropriate health message and website, self-affirmation was tested as a technique suitable for

use in an online behaviour change intervention. It was tested with a sample of students and a sub sample of the target population, low-SES parents. Whilst the central health message to both groups was the same, separate websites reflected the preferences of the two groups. The ways in which these three research questions have been answered in this thesis are discussed in sections 9.2, 9.3 and 9.4.

9.2 What are the barriers experienced by parents with low-SES?

The first two studies described in chapters 3 and 4 had the aim of exploring the day-to-day lives of parents with low SES in North East England, in terms of diet, physical activity and technology use. There was little existing research in this area, in addition when designing interventions for health related behaviours researchers have suggested that they are improved by incorporating the views of the target audience into their development. This purpose was to use some of this evidence to tailor an existing health message to suit the circumstances of parents with low SES.

9.2.1 Study one

This study used thematic analysis (Braun & Clarke, 2006) to analyse interviews with low SES parents living in the North East of England. The interviews explored the day-to-day lives of this group of parents and had a particular focus on diet and physical activity behaviours in family life. In addition the interviews explored the current technology use of these individuals to ascertain whether technological or Internet based interventions are a suitable intervention platform for this group. The study identified barriers these parents experienced in their pursuit of healthy lifestyles, for themselves and their families. The barriers that were identified were, 'time', 'cost', 'unsafe local environments', 'fussy eaters' 'personal barriers' and 'confusion about health messages'. Some of these findings were consistent with previous research, such as 'time' and 'cost' which had been previously suggested by Andajani-Sutjahjo et al. (2004) as barriers to healthy eating and physical activity in mothers various socio-economic backgrounds. Gettleman and Wickleby (2000) had also identified messages avoid confusion and offer clarification about existing contradictory understandings. However some findings were novel; the identification that having children who were fussy eaters could impact on the whole family's diet,

the feeling that the local environment inhibited the family's engagement in low-cost physical activity and the extent to which the parents own concerns about diet and physical activity impacted on the families behaviours. It was also noteworthy that, whilst the interviews were not focussed on the behaviours of their children, the parents' responses often revolved around the behaviour of the whole family. It was apparent that their role as parent was an important part of their self-identity. This highlighted the need to promote personal relevance in the health message.

9.2.2 Study two

This study aimed to explore further the barriers identified in study 1. Q-methodology (Stephenson, 1953) was used to explore the extent to which these barriers were unique to parents with low-SES, this was done by including parents with non-low SES in the sample. The interview data from study one was used to construct a set of statements known as the Q-set. The analysis showed that parents across socio-economic groups experienced barriers such as time, cost and fussy eaters, however there were differences in the extent to which the parents found ways to overcome these barriers. This helped to verify the findings from study 1, but also highlighted that low-SES parents were not alone in experiencing some of these barriers, supporting the findings of Andajani-Sutjahjo et al. (2004). The experiences and beliefs of parents with low-SES were explained by two factors; 'being on a low income makes it hard to be healthy, we do try, but it's hard!' and 'It's not hard being healthy on a low income, you've just got to find a way you can afford!'. The key difference between the two was the belief that being on a low-income made it hard it be healthy. This evidenced a difference in attitude towards their circumstances and suggests that with the right strategies in place parents on a low-income didn't feel that cost hinders their ability to be healthy. This study demonstrated the subtle differences that existed in the parents' understandings, highlighting many of the same factors are at play across parents' experiences, however it was evident that for low-SES parents in some cases, their experiences and circumstances amplified these issues.

Previous research (Hesketh et al., 2005) had highlighted the importance of understanding the views, experiences and circumstances of the target audience when

designing a health related intervention. Furthermore, researchers (Epton & Harris, 2008) had speculated that for self-affirmation technique to be successful, the health message presented post manipulation had to be personally relevant to the target audience. It had been posited personal relevance helps to heighten the personal risk perceived by the target audience (Harris et al., 2007; Armitage, 2008). In order to ensure that the health message used in the website was perceived as personally relevant, the findings from studies 1 & 2 were used to adapt the message from Epton and Harris (2008). This involved ensuring the message made clear it was aimed directly at parents and providing recommendations and advice that related to issues such as cost, time and having fussy eaters, which the parents had identified in these two studies. It had also been highlighted, in chapter 1 that when a health message is presented as part of a website further considerations need to be made concerning the perceived credibility of that website. The next section explains how this question was answered.

9.3 What constitutes a credible health related website?

This section will summarise the findings from the fourth study (described in chapter 6) this focused on the perceived credibility of health advice websites, specifically those providing healthy eating advice. The answer to the second research question, focusing website credibility in the eyes of the target audiences is reported.

9.3.1 Study 4

This study used framework analysis to identify what constitutes a credible health related website. The website credibility models outlined in chapter 1 (Cugelman et al., 2009; Harris et al., 2011), were used to identify the key concepts relating to website credibility. The models had indicated that the components of these models needed to be determined in the eyes of the target audience. Two groups participated in this study, students and parents with low-SES. Interviews were carried out guided by questions that focused on a) Quality of Information and Expertise b) Trustworthiness and Impartiality c) Design Credibility and Visual Appeal d) Personalisation, as indicated by the models. These concepts also provided a focus for the analysis of the data. The findings showed there were similarities in the two

groups perceptions of what constituted a credible website. These included; determining the source was credible and trust worthy; liking clearly labelled easy to navigate pages; a dislike of too much information on one page; a preference for bullet pointed information; the ability to identify a personal relevance with the site and the information contained on it and a preference for sites that were colourful and used pictures. Both groups liked tips and recommendations for how they could incorporate healthier practices into their lives however it was important to both groups that this advice was suitable for their own lifestyles. There were also differences between the two groups' perceptions; parents liked sites they thought were aimed at families and caregivers, and liked images that helped to identify this. Students preferred pictures and photos they could identify with rather than those of people who they felt weren't like them. Students reported a preference for information that they could see was backed up by research evidence, where as the parents were put off if terminology was too scientific. These findings support the concepts outlined in the models, and suggest that the additional component included in the Harris et al, (2011) model; personalisation is an important consideration to make when developing websites containing health advice. These findings, along with those from study 1 and study 2 were used to tailor the health message from Epton and Harris (2008) full details of the final websites, including screen shots were provided in chapter 7.

9.4 Can self-affirming online lead to a measurable change in behaviour?

This section will summarise the findings from the quantitative research included in this thesis. Studies 3 and 5 (chapters 5 & 8) detailed the testing of self-affirmation as a technique to increase the acceptance of health messages thus leading to a measurable change in behaviour.

9.4.1 Study 3

This pilot study trialled self-affirmation manipulations online when the health message was presented as a website. The primary aim of this study was to assess if the self-affirmation technique functions, both as an online exercise and in relation to health related information that is presented via the Internet. Previous studies had

demonstrated that self-affirming could increase the acceptance of a risk-identifying health message in an offline setting (Armitage et al., 2008; Harris et al., 2007; Sherman and Cohen, 2006; Harris & Napper, 2005; Sherman et al., 2000). Furthermore research had recently identified the potential for self-affirmation to lead to a change in behaviour, an increase in fruit and vegetable consumption, based on the recommendations contained in a health message (Epton & Harris, 2008). This pilot study was not primarily focussed on behaviour change, the priority was to assess if self-affirmation technique worked in an online setting as it had in offline settings. This study assessed the effect of self-affirmation to increase intent to perform 3 types of risk-reducing behaviours; fruit and vegetable consumption, physical activity and a combination of both. Consistent with previous research, (Armitage et al., 2008; Harris et al., 2007; Sherman and Cohen, 2006; Harris & Napper, 2005; Sherman et al., 2000), self-affirmed participants reported greater intent to perform such behaviours. There is also some evidence self-affirmed participants had higher feelings of response and self-efficacy in relation to performing these behaviours as demonstrated in Epton and Harris (2008). The participants in this study did not show evidence of a significant increase in performing risk-reducing behaviours however trends in the data are indicative of this.

The evidence reported here suggests self-affirmation can improve message acceptance and supports the use of the technique in an online intervention. Whilst the final intervention focussed solely of fruit and vegetable consumption this study also demonstrated that it could potentially have effects on other behaviours such as physical activity, and even a combination of behaviours (fruit and vegetable consumption and physical activity). This in itself is a promising finding and supports Epton and Harris' (2008) suggestions that self-affirmation may be most effective as a behaviour change technique when it targets health promoting behaviours such as diet and physical activity, rather than the termination of reduction of behaviours such as alcohol or cigarette consumption. The findings of this study, supported the use of self-affirmation technique in this thesis and in combination with the findings from the qualitative studies the final intervention was developed, the testing of this intervention is presented in the following section.

9.4.2 Study 5

This study tested the final intervention aimed at increasing fruit and vegetable consumption by using self-affirmation technique to increase the acceptance of web-based health information. The study also examined the effects of self-affirmation on feelings of response efficacy and self-efficacy, and on intent to consume 5 or more portions of fruit and vegetables a day. Furthermore this study aimed to show that self-affirmation had the greatest effect on individuals who initially consumed the least portions of fruit and vegetables. The findings showed that self-affirmed participants did consume more portions of fruit and vegetables in the 7 days post intervention than their non-affirmed participants, on average they consumed in excess of a portion a day more than their non-affirmed participants. This finding is consistent with Epton and Harris (2008), in fact in Epton and Harris (2008) they reported that self-affirmed participants met the 5-a-day requirement post manipulation. In this study self-affirmed participants did not quite meet that target, however when you consider the baseline consumption of participants in the two studies; SA = 4.8 portions at baseline NA = 4.6 portions (Epton and Harris 2008) and SA = 2.5 at baseline, NA = 3.1 in this study the increase was greater in this study. Self-affirmed participants in this study consumed on average 3.96 portions whereas in Epton and Harris they reported eating 5.05 portions a day. It is important to bear in mind however that ceiling effects may have limited the extent to which consumption would increase given the focus of on the health message on '5-a-day'. Whilst self-affirmed participants in this study did not quite meet the '5-a-day' target, this increase observed is still a significant one; research has highlighted that an increase in just one portion a day can lead to a 4% reduction in the risk for CHD and a 6% reduction in the risk for stroke (Joshipura et al., 2001). This is the first study to demonstrate the effects of self-affirmation on behaviour in relation to a web-based health message, and demonstrate the potential for future interventions to utilise the technique.

The findings also showed that self-affirmed participants reported higher intent to consume 5 or more portions of fruit and vegetables, consistent with the findings from study 3, and with previous research (Armitage et al., 2008; Harris et al., 2007; Sherman and Cohen, 2006; Harris & Napper, 2005; Sherman et al., 2000). Whilst

intent has been shown not to always lead to action in terms of behavior change, it is considered an essential step in changing behavior (Fry & Prentice-Dunn, 2000). This finding also indicates that self-affirmation has increased the acceptance of the risk and recommendations included in the web-based health message. This study also demonstrated that self-affirmed participants reported greater feelings of self-efficacy and tentatively suggested it lead to higher ratings of response-efficacy when comparing against individuals who had not self-affirmed. This was also consistent with the findings of Epton and Harris (2008) and is indicative of the focus of aspects of the message. Epton and Harris reported that response efficacy had mediated the effects of self-affirmation, however the data from this study did not meet the requirements for mediation analysis, suggesting that more clarification is needed about the processes through which self-affirmation functions. This study also demonstrated that the effects of self-affirmation were greatest in individuals who had the lowest baseline consumption; this is the first self-affirmation study to demonstrate this effect in relation to actual behaviour change. This finding is consistent with previous research that has shown individuals whose baseline behaviours indicated they were most at-risk from the negative outcomes, showed greater message acceptance as indicated by ratings on constructs such as intent or behaviours related to intent such as taking more leaflets about smoking cessation (Armitage et al., 2008) or clicking on a link to take an online diabetes test (Van Koningsbruggen and Das, 2009)). Previous research however had not observed this effect in terms of actual behaviour; therefore the findings from this study contribute substantially to our knowledge about the potential for self-affirmation to affect a change in behaviour, in instances where it is needed most.

This study has identified a novel application of self-affirmation technique, by demonstrating its suitability for online behaviour change interventions; showing it can increase the acceptance of web-based health information. It has also replicated the findings of Epton and Harris (2008) by showing that self-affirmation lead to a significant measurable change in fruit and vegetable consumption. This is only the second study to report such an effect and it provides substantial support for further research to explore the potential effects of self-affirmation on other behaviours. It is also the first study to demonstrate the effects of self-affirmation on behaviour were most pronounced in individuals whose baseline behaviour was the least ideal. This

in itself is a significant finding, primarily because it is usually individuals whose behaviour puts them most at-risk from negative health outcomes whom are the hardest to persuade by health messages (Good & Abraham, 2007).

9.5 What are the implications of the intervention?

This thesis has identified and tested a novel technique; self-affirmation, to change behaviour based on the recommendations of a tailored, personally relevant website. What is more, it has demonstrated the potential for a low-cost online intervention to be successful with a group of individuals with low-SES which puts them at a heightened risk of developing diseases as a consequence of their lifestyle. In addition the findings detailed here suggest the effects of self-affirmation on behaviour are most prominent in individuals whose baseline behaviour is putting them most at risk from so called diseases of lifestyle.

The implications of these findings are far reaching. As was outlined in chapter 1, many online interventions have attempted to present individuals with information highlighting the links between behaviour and health outcomes. Many of these however, have been unsuccessful in inducing a large change in behaviour (Abraham and Michie, 2008). This thesis has shown that with the addition of a simple technique, self-affirmation, significant changes in behaviour can be observed. It is particularly noteworthy that the effects of self-affirmation were most pronounced in individuals whose baseline fruit and vegetable consumption was lower. This in itself has important implications given that these individuals are often the hardest to encourage to change their behavior. After all it is these individuals who need to be targeted by behavior change interventions. The implication for health providers and health practitioners are two fold, firstly as Griffiths et al. (2006) posited the Internet provides the basis for low cost, far reaching, timely interventions that remove the stigma sometimes associated with health related behaviours. Secondly, self-affirmation in itself is a low-cost technique that to some extent can be simply 'bolted-on' to health related information. Of course, as demonstrated in this thesis, and in previous research (Epton & Harris, 2008; Armitage et al., 2008), it is essential that the information presented to self-affirmed individuals is personally relevant. Understanding the circumstances and beliefs of the target audience have benefits

above and beyond tailoring a health message and therefore this should be an important step in the development of any health related intervention. The ability to benefit from the low-cost nature of an online intervention using self-affirmation technique is particularly salient in the current economic climate. The low-cost nature of the technique is bolstered by the ease with which individuals can engage with it, without the need for professional support. Individuals in need of making health related changes in behaviour could simply be directed to a site, where a self-affirmation manipulation could be presented prior to a health message that was appropriate to the individual. Of course, this still requires the individual to go to the site, complete the self-affirmation task, and read the health information. However this commitment is much less than in other online interventions that have shown significant changes in behaviour such as providing stress management training and general communication skills training, as detailed in Webb et al., (2010).

9.6 What are the broader implications of the findings in this thesis?

This thesis has demonstrated the importance of understanding the experiences, beliefs and attitudes of the target audience of an intervention. The qualitative findings outlined in studies 1 & 2 and to some extent the findings from study 4, demonstrated the complexities of individuals' circumstances and have shown the extent to which they may contribute to and impact on people's behaviour. In particular these findings have shown parents with low SES have a good understanding of appropriate health related behaviour. On the other hand, the findings suggest they would benefit from information about how to put health recommendations into action. This is particularly important in terms of strategies and suggestions for overcoming barriers that they may feel inhibit their adoption of health lifestyles. Interestingly the results show that not all parents with low-SES perceive the same barriers, and this again highlights the importance of understanding the particular circumstances of the individuals to be targeted by an intervention. The importance of taking into consideration the views of the target audience has been highlighted in the literature (Nutbeam, 2000; Hesketh et al., 2005). These findings in this thesis further advocate the importance of doing so, primarily to ensure that health messages and advice are appropriate but also because these findings can be used to promote a personal relevance in a health message.

The findings outlined from these studies (1 & 2) suggest that technology use is already well integrated into the lifestyles of these individuals, and whilst these qualitative findings are far from conclusive they give a promising indication of the potential for web-based interventions with this group. Chapter 1 outlined concerns that internet based interventions may not be suitable for individuals from low SES backgrounds and particularly those living in the North East of England. However the participants who took part in the studies reported here, all had access to the Internet whether it was through always on broadband, via a pay as you go mobile service or on their mobile phones. This shows potential for Internet based health interventions to be developed for low SES individuals. The growth in mobile technologies also has important implications for self-affirmation interventions. There is potential for interventions such as the one described in this thesis to be developed specifically as Smart phone applications. It was noted, anecdotally, that some participants completed the diary element of study 5 via their mobile phones. This suggests that future research should consider developing mobile applications that can deliver the self-affirmation manipulation alongside tailored or even personalised health advice. Such interventions could benefit from current and advancing profiling technology, providing user specific services and information based on information collated on the user.

Study 4 contributed to our understandings of what constitutes a credible online health message. Website credibility models had outlined key concepts that lead to a trust on online health advice, however the models highlighted the importance of understanding these concepts in the eyes of the target audience. Previous research had pointed to design features of web pages and noted the importance of easy to navigate pages, well organised clear information and the use of colour and pictures (Fogg & Tseng, 1999). However, little was understood about the specific preferences of either students or low SES parents when it came to looking for health eating advice online. The findings here showed that whilst there were common preferences between the two groups, there were clear differences in their perceptions of what made a website credible. This study supports the use of models such as Cugelman et al., (2009) and Harris et al., (2011) in the development of health related websites, and highlight the importance of assessing these constructs in the eyes of the

target audience. It should be an important component of the development of any health related website that the views of the target audience are taken into consideration. In fact as demonstrated here, by using the same central message, small modifications can be made to both message, content and website design to target different groups. Researchers should be aware of the importance of doing this and should aim to work with the target audience in the development of any web-based intervention.

9.7 Limitations

Whilst this thesis has demonstrated a series of novel and potentially useful findings there are some limitations that need to be acknowledged. Firstly this thesis had aimed to develop an intervention that could be tested solely with the target audience, parents with low-SES, unfortunately for a number of reasons this proved not to be possible. The data available (in study 5) for the effects of self-affirmation on the behaviour of the target audience, whilst promising, would benefit from further testing with a larger sample. This shouldn't detract however from the significant effect of self-affirmation on behaviour that was observed in this group and across the wider sample.

Secondly, this thesis employed a self-report measure of participants' behaviour. Whilst self-report measures are widely used, they are not without their issues. As with any self-report measure there is always the possibility that the effect of an experimental manipulation is evident in the reporting of the behaviour rather than in the behaviour itself. In the case of the intervention outlined in this thesis, there is always the possibility that self-affirmation makes people more aware of what they should be doing in terms of their behaviour, rather than causing a change their actual behaviour. Their desire to behave in a socially desirable way means they report what they think they should be doing rather than what they are doing, or at least exaggerate their own behaviour. The only way that this can be overcome is to include objective measures of behaviour although this is particularly problematic and methodologically complex for behaviours such as diet. Future research could seek to employ more objective measures of behaviour in order to determine more precisely the effects of self-affirmation on behaviour.

9.8 Future research

This chapter has touched upon some areas for future research, namely the potential to develop a self-affirmation manipulation to be delivered on a mobile device, and the inclusion of more objective measures of behaviour in order to get a clearer picture of the effects of self-affirmation. However there are additional directions that future research can take.

In chapter 1 consideration was given to the processes at work in self-affirmation, although it was not within the remit of this thesis to explore these processes. However the findings here do give some indication that constructs such as response efficacy and self-efficacy may play a role, this is also consistent with previous research findings (Epton and Harris, 2008). However more research is needed to fully understand this process, as in this thesis it was not found that response-efficacy mediated the self –affirmation process as reported in Epton and Harris (2008). Future research needs to consider including baseline measures of constructs such as self-efficacy and response efficacy as well as post manipulation measures. This will provide a clearer picture of the processes at work in self-affirmation manipulations.

Chapter 1 also highlighted a key motivation for targeting the behaviours of low-SES parents was the potential impact that changing the behaviours of parents could have on the behaviours of the whole family. In order to assess this, future research should consider measuring the behaviour of other family members such as children, to see if changes in the parent's behaviour can lead to changes in the behaviour of the whole family. This is particularly important as interventions have been shown to be most effective when they target the whole families behaviour, but such interventions are costly and time consuming, web-based self-affirmation intervention offer the potential to intervene in a low-cost, low intensity manner but with potentially large effects.

In addition, whilst this thesis tailors a health message to the beliefs and circumstances of low SES parents, technological advancements allow for tailoring on an individual level. Future research should look at the potential to utilise user data,

to personalise a health message to their specific requirements. Bennett and Glasgow (2009) posit the potential for technologies to compile large amounts of user data provides a valuable resource to design health messages to the specific needs of an individual. Researchers should look to profit from this and design health messages based on the specific requirements of the individual, this may bolster the effectiveness of self-affirmation manipulations leading greater changes in behaviour.

Future research must also assess the longevity of the effect of self-affirmation. Whilst the findings presented in this thesis have shown a change in behaviour sustained over the course of a week, to be truly effective such changes in behaviour need to be maintained in the long term. In order to determine if self-affirmation, leads to sustained changes in health related behaviour, researchers need to investigate if this behaviour change is maintained over longer periods than observed in this thesis.

9.9 Final conclusion

The main aim in this thesis of tailoring and delivering a web-based intervention, to increase fruit and vegetable consumption has been achieved. The barriers that influence health related behaviours have been documented and described. This has expanded our current knowledge of the barriers experienced by parents with low SES, highlighting further issues not accounted for in the previous literature. Self-affirmation has been successfully applied in an online context and has been shown to be a viable technique to change behaviour. Overall the findings from this thesis have raised the profile of self-affirmation theory, and have highlighted the legitimacy of it as a technique suitable for inclusion in online interventions.

The forecast for mortality from lifestyle related diseases is bleak, however web-based interventions offer a low-cost, anytime, anywhere solution to this growing problem. Health service providers need to incorporate these findings into future interventions to help reduce the impending burden of these preventable diseases.

10.1 Study 1 example participant information sheet

<u>Lifestyle Interview</u>
Principal Investigator: Amy Fielden
Investigator contact details: Tel: 0191 2273716
E-mail: amy.fielden@nothumbria.ac.uk
Participant ID Number……………………………………………

These interviews are being conducted with the co-operation of Sunderland Children's Centres, for more information contact Moira Scales: moira.scales@sunderland.gov.uk
The purpose of these interviews is to gain an insight into your everyday lives, to establish how you organise your time and the sorts of things you do as an individual and as a family. In addition we are collecting information about your food shopping habits, and the way you like to spend your spare time including keeping fit and using the computer.
You have been selected to take part because you are a parent with a young family. You may pull out at anytime during the project, and can do so by contacting the principal investigator up until the point of publication.
The recorded sessions and your details will at all times remain confidential, and the information you provide will be anonymous. The only people with access to this information will be the research team, and it will be stored in a safe and secure place under lock and key. This study has been approved by the University of Northumbria's ethical committee.
The Children's Centre will receive a summary of the completed study sometime in September, which you may feel free to access through them, or by contacting the principal investigator directly.

Please provide us with details, of the age and gender of your children.
....
....
....
....
What is your occupation?
………………………………………………………………………

10.2 Study 1 interview guide

Verbal Brief

Today you are taking part in an interview to discuss aspects of you day-to-day life. I just want you to talk me through a typical day in your life and along the way I'll make some notes and then ask some more question based on the things you've told me. As you can see I am recording these sessions, you are free to withdraw at anytime. Are you happy to go ahead?

Ok, so can you just talk me through a typical day? Just start with when you get up and the daily routine you go through? Prompt as needed

So what sort of things do you as a family generally eat?

Do you and your children eat the same things.....why?

What sort of things do you as a family enjoy doing together?

So you play games, traditional board games, sorts, computer games?

What sorts of things do you like playing/doing as an individual?

What about your children? Your partner?

Do you take part in any sort of sports or exercise, what types?

Do your children take part in much physical activity, what types?

Do you or your family play computer games?

What sort of technologies do you have at home?

Are these things you do together as a family?

Thank you for taking part. If you need to contact me or wish to withdraw, my details are on the information sheet and debrief sheet provided.

Thanks-again

10.3 Study 1 example transcript

AF: Right so really I just want to ask you some questions about the things you do every day as a family. Do you want to start by talking me through the typical things you do together, if it involves going to work, perhaps a weekday and the weekend, whatever the differences is. The kinds of things you might do and eat and the places you might go to eat. And we will take it from there is that's alright.

P1: Well weekdays when I get home from work it's at about 6 so the boys have already had their tea by then and it's just wind down time. So just have a play or watch a bit of telly and then at 6.30-6.45 start getting them ready for bed. The youngest goes down at about 7 the eldest at about 7.30. We just have cuddle time, between 7 and 7.30 it will be the Simpsons or SpongeBob and we eat celery and carrots while we are watching that, I don't know who laughs harder me or him. And weekends are different we will maybe just go somewhere or maybe and then eat out wherever we fancy.

AF: What sorts of things do you generally eat then? You said you sit down and have celery and carrots that's...

P1: That's the healthy things; generally we eat anything and everything. We are not vegetarians or anything like that so we try to eat a variety of meals, I cook. Weekends are when we sit down and have the proper meals obviously with us working till about 5.45 so um we eat anywhere we do have fast food but we try to limit that to maybe once a month if that.

AF: What sort of fast food do you have?

P1: Well we have things like KFC so it's bad but it's not as bad as other things I would say as they have like chicken breast and things like that. But if we are eating out it's somewhere like Nandos or places like that so.

AF: Places that are pretty Kid ?

P1: Yeah exactly, that's the kid thing, where they all have a kid's portion and something for the kids to do that's important.

AF: Do the kids tend to eat the same things as you or do?

P1: They tend to eat different but we try to give them a bit of ours so they try different things and have all of the different tastes. We were through ********* last week for the Chinese New Year.

AF: Was it good?

P1: It was brilliant, the little ones face; he was like "Dragon, Dragon!" But we have like prawn crackers, noodles, fried rice to try and get them to taste other things

AF: Great, so they are exploring taste in other things. So as a family what do you do together as a family?

P1: We play on the wii, we've got one of them and we have 4 controllers which is quite sad! So that's exercise at the same time. We all go shopping, um we may go to fun house, we may go to museums as they love the discovery museum in *********** or I will take them to the winter museum which isn't as kid happy but the discovery museum is good. Which is the one I want to go back to myself? Oh the Hancock museum I want to go back to myself! Try and read the things and stuff. Those sorts of things, and we take them to the grandparents so they have time to spend with the cousins and stuff like that.

AF: Ok so you say you play on the wii what other types of games do you play as a family together?

P1: Well we have got fairly traditional board games and bits and pieces but that tends to be just one of us, with having a three year old and all. Um they play on the computer as well, they go on the CBeebies website, as its all secure and stuff and they are starting to play Mijong, which is incredible, you see them matching all the tiles up especially the youngest has fantastic mouse control for someone who is so young. He has got his little toy laptop and he plays with that, really good control.

AF: So do you think those types of computer games and technologies have got a good place.

P1: Absolutely, I work in IT, I am an IT support person and I know they need that skill set to survive, for work, school, everything. For example there schools are introducing computers like word processors into the classroom setup and they have profiles on our computer, with a password and he knows he doesn't tell anyone his password except us and he knows how to type it in and then on the back end its all loaded with parental controls and stuff so he is only allowed don it at certain times in the week and the weekend.

AF: How do you feel about the counter argument that time on the computer is time when they are not running around and stuff, just out of interest.

P1: Its education and they need that skill set and obviously I am quite an advance usersand I don't want my children to be computer illiterate and I think not being able to use a commuter is the same as not being able to read and write in this day and age.

Its and essential skill, but the running around bit they do by themselves, I throw them about and we have a little play and a tickle and just horse play.

AF: So in terms of activities, any sports, what kinds of things are they in to?

P1: Both of them are learning to swim and I think they are really enjoying that. Nothing in particular they are just into running about and having fun like kids do at that age and then I pick them up and chase them around and tickle them and have them jumping on my back just horse play like that.

AF: So you yourself do you take part in any sports.

P1: Well I used to, I used to go down the gym but now the wife's working on a course and my knees playing up a bit but I do enjoy the gym when I get down there and I do a bit of hiking which I haven't down in ages, I desperately miss that, going down hiking in the lakes. I used to play a bit of badminton with the wife, a bit of squash

AF: So it's just time?

P1: I guess so, if I went to the gym 2 or 3 times a week, the wife is on a 2-day course so we would never see each other. But I have the balance board and wii fit so I do a bit of stuff on there. I guess it's cost too?

AF: In what way?

P1: I mean like with the gym, it's a bit pricey now, I think that's why I've been using the wii, like the whole family can exercise and I don't have to pay all those monthly subscriptions.

AF: So do you all use it for exercise?

P1: Well some of the time!

AF: Ok well thank-you, it looks like time is about up!

P1: No problems,

AF: Thank-you

10.4 Study 2 instructions for participants

Dear Participant,

Thank-you for agreeing to take part in this study, it is concerned with healthy lifestyles and barriers that exist to families in adopting healthier lifestyles. Enclosed is some information for participants and a consent form which must be signed and returned. Please also return the participant details sheet, you should retain the participant debrief for yourself. In addition there is also a set of study instructions, a pack of statements (66 in total) and a grid sheet where you will need to record your final Q-sort.

The statements included have been obtained from a series of interviews with parents all of whom have school aged children and therefore represent understandings, beliefs and issues experienced by other parents. Please be honest in your responses as we are looking to gain a true perspective of how everyday life impacts on parents, and healthful behaviours. The pack of statements should also be returned.

If you at any point up to publication of the results (which will not include any information that identifies you) you which to withdraw, contact the principle investigator with your Participant ID number. We may also like to contact you once the results have been analysed in order to verify elements of your Q-sort. If you are happy for us to do this, then please indicate so on the consent form. In addition if you which to add to your Q-sort by explaining any of the positioning on the grid we would be grateful for that information as well.

Thank you again for taking part and feel free to contact me at any time if you have any queries with the study.

Best wishes,

Amy Fielden

Q- Sort Study Instructions

1) Please spend a few minutes reading through the statements you have been provided with. Whilst you do this try to sort the statements into three piles. Those which you strongly agree with or consider to be most representative of yourself should form one pile; place these to your right. Those which you most strongly disagree with or consider being the least representative of your selves should form the second pile, these should be placed to your left. Statements placed in the third pile, in the middle should be those to which feel neutral, or uncertain.

2) Spread out the items in the piles ensuring that you still follow the right-centre-left sorting pattern. This should help you consider the statements in relation to one another, and allow you to make comparisons.

3) Studying the items to the right select three statements that are most like your position or those with which you see as being most representative of yourself.

Place these items under the +5 marker. The vertical order of the statements is not important; all items under the +5 have the same value.

4) Turning to the left side, pick three items that are most unlike your position or those which you most strongly disagree with. These items should be placed under the -5 header; again the specific order going down does not matter.

5) Returning to the right side pick four items from those that remain that are most like your position, but not as representative as those that you have placed under +5. If you which to swap items under +5 and +4 feel free to do this, you can revise the position of items at any point during the sorting process.

6) Moving back to the left side repeat the process by placing four items from those that remain under the -4 heading, again switching items in the two columns is perfectly fine.

7) Repeat the process alternating between positive headers and negative headers working towards the middle "0" column, Items placed in the centre column are those generally which are left over after the other columns have been filled. These should be those, which you have neutral feelings towards.

8) Take a few minutes to review the sorting of the items. Make any adjustments that you wish so that you can more accurately portray your personal view.

9) Record the statement numbers onto the grid provided and return the sheet to the researcher.

10) A further sheet is provided for you to note down any observations or feeling you have about the statements and the sorting of them. Feel free to make justifications or explanations for your sorting and highlight any particular issues you had in completing the Q-sort.

10.5 Study 2 Q-sort statements

1) There is no time to do anything I'm just stuck in the house all day.	2) It's not really hard to find time to do exercise I just choose to do other things.	3) My kids are fussy eaters and won't eat healthy things- I can't be bothered with the hassle of arguing with them.
4) I can't afford to buy loads of fresh fruit and veg –they always go off before they get eaten.	5) We've started using our games console for exercise-it is useful when I don't want them playing outside.	6) My kids would rather be in front of the TV than outside playing.
7) There is nowhere for the children to play-somebody needs to watch them if they want to go outside.	8) I don't let my children play outside when the days get shorter-too many accidents on dark nights.	9) My kids are always playing on computer games.
10) I can't be bothered to supervise my children all of the time-I have other things I need to be doing.	11) Computer games are a waste of money they only keep my children interested in the short term.	12) It worries me that children are preoccupied with being fat – it creates other health problems.
13) It is more important that my child just eats something regardless of how healthy it is, rather than nothing at all.	14) Exercise is too expensive- gym membership, swimming, exercise classes.	15) Being on a low income makes it harder to be healthy.
16) You should do activities despite the costs as you can't put a price on your children's health.	17) After you've spent money buying your children computer games etc. There isn't money left for other stuff.	18) It is really hard to motivate my kids, they just want to sit in front of the computer.
19) I find doing exercise can be embarrassing-especially if you need to get weighed.	20) Exercising at home allows me to overcome the embarrassment of exercising in public like going to the gym.	21) I think technology stops people from getting out and exercising.

22) I don't like letting my kids play out-there are too many paedophiles around, it's not safe.	23) I can't physically stand and watch my kids while they are playing outside, so I'd rather keep them inside.	24) Because I can't swim and don't do any sport it makes it hard for me to do those things with my children.
25) I worry about my children especially when they're older, not eating properly-they might have copied that from me.	26) I don't want to be seen in a swimming costume or gym kit so I don't get involved in sport with my children.	27) I can't stop my children from going to the kitchen and helping themselves to food.
28) I try not to buy unhealthy food but you need some treats in the house.	29) It's too tempting at the supermarket not to buy unhealthy stuff when they are on special offer.	30) I think kids get most of their health information from other kids.
31) Advertising for food is misleading and confusing-my son won't eat sweet corn in case he turns into a big green giant!	32) The newspaper says one thing, then a leaflet tells you something else and then the TV says this- how do you know who is right when it comes to being healthy.	33) You're always told five a day but what is a portion-it's different for everybody isn't it?.
34) I can get my children to eat the fruit but not the vegetables.	35) We're always being told to eat more fruit but then the dentist say the sugar in fruit is bad for your teeth- I don't know who to listen to.	36) My children can't eat five portions of fruit and vegetables a day.
37) You get scared because you can get done for neglect if your children are overweight or if they are under, but they are growing all the time it's impossible to measure them.	38) It makes me laugh because all these health workers telling you to eat healthily are all fat themselves, they don't set good examples.	39) We talk about obesity too much and children pick up on this, they are confused-we need to focus on being healthy.

40) It is my responsibility to set an example to my children, I know already they pick up on what I do, so I have to try and be healthy.	41) I have fussy eaters and have to hide veggies in their food it's the only way I can get them to eat them.	42) It's parents fault if children are fussy eaters they need to stand their ground and not give in to their children's demands.
43) I don't have much control during the week over what my children eat as I'm at work all the time.	44) It's only really at the weekend when we sit down and have proper meals together that we've usually cooked together as well.	45) If we have fast food it's always like fried chicken, so it's not so bad- at least it's like real chicken breast.
46) Eating out can be difficult you need places that are kid friendly and do kid portions- normally that is fast food places.	47) We try to do activities in the limited time we all have together but these need to include educational trips as well as physical activities.	48) I really think it is important to learn IT skills as importing as reading, writing and maths.
49) I am concerned about safety when letting my children play on line computer games it is important that they all having strong parental controls.	50) It is hard trying to find the time to do physical activity myself. My partner is at work full time as well, so finding time for me is difficult.	51) I try to do some sport, before I had my family I did lots of things but now I really struggle.
52) I find these new games consoles like the Wii a really good middle ground for being able to squeeze some physical activity into by busy schedule.	53) It is important to find things that the whole family can do together; this makes it easier to fit things in by combining family time with some sort of sport.	54) Keeping fit is expensive, in today's economic climate it is something that may have to be cut out to save money.
55) My children eat everything, they have the same as us and I think this is important in encouraging them to eat a balanced diet.	56) I don't have time to do any sport now but I find time to go and watch my children take part, it makes me miss running around like that.	57) We spend time together as a family playing board games and other things like cards as a family.

58) It is easy to do physical activity if you don't feel like you're exercising, you need to have fun and enjoy what you're doing.	59) I have lots of good intentions about exercise but I get bored easily and only ever manage to stick at it for a few weeks.	60) My job is really physical so that keeps me fit which helps me with running round after the kids.
61) It is really important for my kids that they take part in sport, for their wellbeing in general-both physically and mentally.	62) I encourage my kids to play outside; they need fresh air as well.	63) I haven't got time to fit proper sport into my routine, but I'll jog back from walking the kids to school, things like that.
64) In terms of doing stuff together as a family and being good for the kids I think consoles like the Wii are a brilliant idea.	65) The key to getting children into sport is to do it in a way that they will find fun.	66) We are limited with where the children can play outside; the roads are so busy you don't want them to go too far.

10.6 Study 2 Q-grid for participants

Principal Investigator: Amy Fielden
Investigator contact details: Tel: 0191 2273716
E-mail: a.fielden@nothumbria.ac.uk

Participant Identification Number: ....

Most Unlike my POV   Neutral   Most Like my POV

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
3	4	5	8	8	10	8	8	5	4	3

10.7 Study 3 Health message from Epton and Harris (2008) as it appeared on the website with images.

Screen 1

<u>**5 A DAY**</u>

Health professionals, from around the world, currently recommend eating at least 5 portions of a variety of fruit and vegetables per day to deter chronic diseases and promote a healthy body. These recommendations can benefit everyone regardless of age or gender.

Screen 2

The Prevention of Chronic Diseases

It has been estimated that increasing your consumption of fruit and vegetables can significantly reduce the risk of many chronic diseases, such as heart disease, stroke and cancer by up to 20%.

Diet may contribute to the development of one third of all cancers, therefore the second most important strategy that can be used to avoid cancer, after reducing smoking, is to heighten fruit and vegetable consumption. In 1988, The Department of Health's Committee on Medical Aspects of Food Policy and Nutrition reviewed the evidence and concluded that higher vegetable consumption would diminish the risk of colorectal (bowel) cancer and gastric (stomach) cancer.

Higher consumption of fruit and vegetables also decreases the risk of coronary heart disease and stroke. A recent study found that each additional portion of fruit and vegetables a day lowered the risk of coronary heart disease by 4% and the risk of stroke by 6%. Evidence also suggests that an increase in fruit and vegetable intake can help lower blood pressure.

Screen 3

The Promotion of a Healthy Body

There are many advantages to augmenting fruit and vegetable consumption, including enhancing the immune system and improving bowel function. It can also aid the management
of diabetes.

Some fruit and vegetables, such as green leafy vegetables and oranges, are also good sources of foliate. All women of childbearing age are recommended to elevate their consumption of foods naturally high in foliate and foods fortified with folic acid.

A recent longitudinal study, of 35,000 women, has shown that eating 30g of fibre each day has a protective effect against breast cancer, in pre-menopausal women. The report states that 5 portions of fruit and vegetables must be consumed each day in order to achieve the 30g daily fibre target.

Research suggests, a diet rich in fruit and vegetables has protective benefits for some common cancers, such as bowel cancer. The overall health benefits of such a diet are undeniable

In addition to the direct health advantages, eating fruit and vegetables can help to achieve other dietary targets. High fruit and vegetable consumption increases fibre intake that contributes to reducing blood cholesterol levels and helps to maintain a healthy digestive system. Replacing foods high in fat and with added sugars (which may also contribute to tooth decay), with a higher proportion of fruit and vegetables will boost the chances of reaching the goal of a healthy body weight.

Screen 4

How it works

The reason why fruit and vegetables are so beneficial is because of their array of compounds. As well as vitamins and minerals (e.g. folic acid, vitamin C and potassium), fruit and vegetables also contain many non-nutrient complex plant compounds (called phytochemicals), including flavonoids, glucosinilates and phyto-oestrogens; these are implicated in improved function of the immune system. Some vitamins and phytochemicals are also antioxidants that destroy free radicals in the body. Free radicals are known to have a role in causing cancer in addition to other harmful effects.

It appears that the beneficial effects of fruit and vegetables stem not only from the individual components, but also from the interaction between those components. Dietary supplements containing isolated vitamins and minerals do not appear to have the same beneficial effects as fruit and vegetables themselves. Indeed in some studies, supplements have caused more harm than good.

Screen 5

Recommendations

To receive the beneficial health effects from increased fruit and vegetable consumption, at least 5 portions of a variety of fruit and vegetables (excluding potatoes and nuts) should be consumed daily. The fruit and vegetables can be fresh, frozen, chilled, canned or dried.

One portion of 80g can be estimated as:

- o   3 tablespoons of vegetables
- o   2 or more tablespoons of pulses (e.g., beans, lentils)
- o   1 cereal bowl of salad
- o   1 medium sized fruit (e.g., apple, banana, pear, orange)
- o   2 smaller fruits (e.g., plum, Satsuma)
- o   1 cup of very small fruits (e.g., berries, grapes)
- o   2-3 tablespoons of fresh fruit salad, stewed or canned fruit
- o   1 tablespoon of dried fruit
- o   1 or more glasses of fruit juice

Screen 6

How to increase your fruit and vegetable consumption

To ensure you meet the 5 A DAY recommendation you could:

- o   Drink fruit juice with your breakfast

- o   Add chopped fruit to your breakfast cereal

- o   Eat fruit as a starter or a desert
- o   Eat homemade vegetable soup

o   Serve 2 large portions of vegetables with your dinner
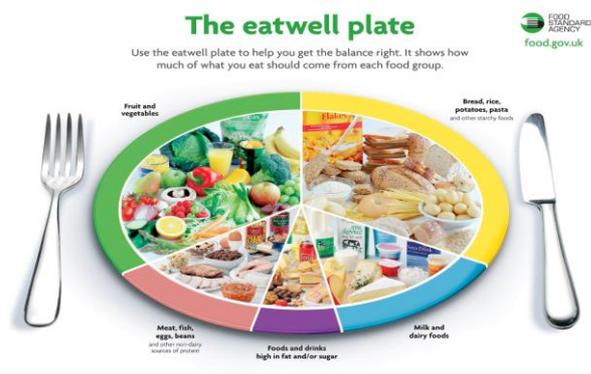
o   When eating out try the vegetarian option or order a side salad / extra
    vegetables
o   Keep a stock of fruit and vegetable sticks for snacks

Screen 7

Further Information

Department of Health   Change4Life
www.doh.gov.uk/fiveaday   http://www.nhs.uk/change4life
020 7210 4850

Screen 8

Thank you.

10.8 Study 3 & Study 5 self-affirmation manipulation from Epton and Harris (2008)

Personal Attributes Inventory

The following questions are designed to measure level of kindness toward others. These questions refer to behaviours that YOU have performed for other people. As you read each question, please try to recall a time when YOU performed each behaviour for another person. There are no right or wrong answers, so please be as honest as possible. Place an "X" next to the answer that best describes your behaviour toward other people. If you answer YES to any of the questions, please provide a short example of the last time you performed this behaviour.

Have you ever forgiven another person when they have hurt you?
_____ YES   _____ NO IF YES, EXAMPLE:

Have you ever been considerate of another person's feelings?
_____ YES   _____ NO IF YES, EXAMPLE:

Have you ever been concerned with the happiness of another person?
_____ YES   _____ NO IF YES, EXAMPLE:

Have you ever looked out for another person's interests before your own?
_____ YES   _____ NO IF YES, EXAMPLE:

Have you ever been generous and selfless to another person?
_____ YES   _____ NO IF YES, EXAMPLE:

Have you ever attended to the needs of another person?
_____ YES   _____ NO IF YES, EXAMPLE:

Have you ever tried not to hurt the feelings of another person?
_____ YES   _____ NO IF YES, EXAMPLE:

Have you ever felt satisfied when you've helped another person?
_____ YES   _____ NO IF YES, EXAMPLE:

Have you ever gone out of your way to help a friend even at the expense of your own happiness?
_____ YES   _____ NO IF YES, EXAMPLE:

Have you ever found ways to help another person who was less fortunate than yourself?
_____ YES   _____ NO IF YES, EXAMPLE:

10.9 Study 3 & Study 5 Control task from Epton and Harris (2008)

Personal Opinion Survey

The following questions are designed to measure personal opinions. These questions refer to YOUR opinions on each topic. There are no right or wrong answers, so please be as honest as possible. Place an "X" next to the answer that best describes YOUR opinion. If you answer YES to any of the questions, please provide a reason why you believe this statement to be true.

I think that the colour blue looks great on most people.
_____ YES   _____ NO IF YES, WHY?

I think that chocolate is the best flavour of ice cream.
_____ YES   _____ NO IF YES, WHY?

I think that winter is the most satisfying season during the year.
_____ YES   _____ NO IF YES, WHY?

I think that the best smelling trees in the world are pine trees.
_____ YES   _____ NO IF YES, WHY?

I think that cooking is an important skill to possess.
_____ YES   _____ NO IF YES, WHY?

I think that house plants help to brighten a home.
_____ YES   _____ NO IF YES, WHY?

I think that sewing is an important skill to possess.
_____ YES   _____ NO IF YES, WHY?

I think that the beach is a great place to go on holiday.
_____ YES   _____ NO IF YES, WHY?

I think that busses are the best form of public transportation.
_____ YES   _____ NO IF YES, WHY?

I think that fruit makes the best dessert.
_____ YES   _____ NO IF YES, WHY?

10.10 Study 3 & Study 5 Self-efficacy and response efficacy measures from Epton and Harris (2008)

Resp3prev: My chances of experiencing heart disease and some cancers in the future, if I do not eat at least 5 portions of fruit and vegetables are ... (1-7 very low – very high)

Resp1prev: Eating at least 5 portions of fruit and vegetables each day will reduce my risk of heart disease and some cancers. (1-7 strongly disagree – strongly agree)

Resp1prom: Eating at least 5 portions of fruit and vegetables each day will improve my health by boosting my immune system. (1-7 strongly disagree – strongly agree)

Resp3prom: My chances of experiencing a healthy immune system in the future, if I do eat at least 5 portions of fruit and vegetables are ... (1-7 very low – very high)

Resp2prev: How likely is it that you will experience poor health in the future if you do not eat at least 5 portions of fruit and vegetables each day? (1-7 not at all likely – very likely)

Resp2prom: How likely is it that you will experience good health in the future if you do eat at least 5 portions of fruit and vegetables each day? (1-7 not at all likely – very likely)

SE1: I know for sure that I could adhere to eating at least 5 portions of fruit and vegetables each day. (1-4not at all true, barely true, moderately true, exactly true)

SE2: I doubt that I could manage to eat at least 5 portions of fruit and vegetables each day. (1-4 not at all true, barely true, moderately true, exactly true)

SE3: I can usually resist the temptation of delicious, but unhealthy, food. (1-4 not at all true, barely true, moderately true, exactly true)

SE4: If I intend to take up eating at least 5 portions of fruit and vegetables each day, I know that I can stick to it. (1-4 not at all true, barely true, moderately true, exactly true)

10.11 Study 3 & Study 5 Manipulation Check from Napper, Harris and Epton (2009)

Thinking back to the writing task you completed earlier. Please answer the following questions keeping your thoughts at that time in mind.

The paragraph I wrote earlier made me think about…

Things I don't like about myself	1	2	3	4	5	6	7	Things I like about myself
Things I'm bad at	1	2	3	4	5	6	7	Things I'm good at
Things I don't value about myself	1	2	3	4	5	6	7	Things I do value about myself
Things I'd like to change about myself	1	2	3	4	5	6	7	Things I wouldn't like to change about myself

The additional two questions included in the manipulation check in Study 5

The paragraph I wrote earlier made me aware of…

Who I am

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
θ	θ	θ	θ	θ

My values (the principles and standards by which I try to live my life).

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
θ	θ	θ	θ	θ

10.12 Study 4 interview guide

What do you like about the website?

Is it visually appealing? Why?

Does the site appear professional?

Do you trust the source of the information? Why?

Do you believe the sources of information are experts? Why?

Do you feel the site was owned developed by a well known organisation?

Do you believe the source to be impartial? Why?

Do you feel the advice and information is relevant to you? Why?

Do you feel the advice and information is usable for you? Why?

Would you act on the information and advice presented? Why?

Please comment on any aspect of the websites that contributes to how credible you believe them to be.

10.13 Study 4 instructions for participants

The purpose of this study is to ascertain what you aspects of websites, offering advice on healthy living, you perceive to be credible. During this task you will be asked to use a search engine (we are suggesting Google, however if you typically use a different one then feel free to use that).Please search for 'healthy eating advice'. We anticipate that the top results will include:

www.nhs.uk/livewell/healthy-eating

http://www.bbc.co.uk/health/treatments/healthy_living/nutrition/index.shtml

There will also be sponsored links from companies such as:

www.florahearts.co.uk

You could also look at:

www.change4life.co.uk

You are by no means restricted to these sites, and we would like you to search in a manner that replicates your normal search routines. Software will be recording you search please think and I'll be asking you some questions when you are looking at the sites, and talk me through your thoughts on viewing the websites.

10.14 Study 4 example transcript

AF: Just pick whichever you would be most likely to pick if you were at home. Why would you pick that one?

P: Because it's the NHS so its quite trustworthy. It's quite good because you trust it and it doesn't have the adverts which are annoying and make it seem a bit less trust worthy.

AF: Do you like the way it looks?

P: I think it's a bit overcrowded because they are trying to get loads and loads in. But I think maybe they need to space it out a bit more like down the side. Um I would want to know things that pretend to be really healthy but actually aren't. Like things like Kettle crisps, obviously they are crisps but they say that they are all natural so you think that they are more healthy but actually they aren't . Stuff like that I want to know, the things that pretend I don't think they have that on here though. Its good that it gives you a balanced diet stuff and avoids the dodgy diets.

AF: So would you steer away from…

P: Like Atkins and things, I have just heard so many bad stories and stuff and it makes sense that you shouldn't just cut out an entire part of your diet. It's good that it's got a meal planner and stuff so you can try and be more healthy and lose weight or something. The BMI calculator is quite good.

AF: Are the tools you could see yourself using?

P: I could use the meal planner on there. I am not sure I would use the BMI. Oh perhaps it has that supermarket health checker, perhaps that checks about the unhealthy food. So it counts how many things you put in your trolley that contribute to different parts of your diet. That's quite useful.

AF: Yeah it's quite practical.

P: I think it's quite a friendly site, like little pictures and cartoons so it would be good if you had a kid to get them involved in healthy eating. I do think it's a bit over crowded.

AF: Does it look professional?

P: Yeah because it's the NHS I would trust it and because its such a big thing, but like one of those little ones you read it and think oh dear but you never really trust it. You know when you get ill and you Google your illness and it comes up with you have 5 days to live.

AF: is there any reason why you are ignoring these ones at the top?

P: I don't know I just seem to ignore them, because it seems like they are because it says adverts it seems like they are not as trustworthy because they are paying to be in that box.

AF: Why have you picked that one?

P: Again it's the government so I think it would be more trustworthy than the little ones although I think this website makes things seem a bit more dramatic, I don't know why I think its because this has everything from epidemics to really average things but I associate it with the really scary things even though healthy eating isn't really scary!

AF: So is this a website that you have used before?

P: Yeah I read this book about mad cow disease and I Googled it and ended up on this website and it really scared me, but obviously healthy eating isn't really scary. I think also with the NHS it gives it pictures and stuff which gives it a positive feel but with this one its just listed, not listed but its totally black and white. It just seems so much more serious. I suppose they have to take things serious, health and things, but because every page is the same and obviously the scary things are like that, but it makes every page seem so serious.

AF: You associate that format with more sever health problems. What is it about the BBC that draw you to that page?

P: Again you think its trustworthy, I wouldn't say its as trustworthy as the other two but I don't think they would put any extreme information on that hasn't been properly proven whereas other websites might.

AF: Is it important where the website has got its information from?

P: Yeah I wouldn't want to be like this is really healthy for you and then in a months time they be actually its bad. Like how in newspapers they make massive contradictions, like mobile phones are killing us and then the next month oh no they are not! Its like having a website about health that's.

AF: Does the way they present their information help support that?

P: Um, I don't like something about it but I don't know what that is! Um it kind of looks like a recipe page which I don't think is that good, but I think if you are looking recipes they have a picture of the food, whats in it and then a description, and this is like diet which is related so I see why its similar but a healthy lifestyle is not the same as a recipe thing. Its good that they also have a BMI calculator and a thing to put your weight on and track.. I think if people get involved with their weight instead of just saying they are going to eat healthy, I think if there are tools and stuff they are going to take much more interest.

AF: Do you notice things like this, like where else you can get information from?

P: It does when you see it but I had never actually noticed that, maybe they should support them and be putting more detail or just, I don't like the layout of this website so I find it hard to be drawn into things.

AF: Yeah

P: I wouldn't really ever go passed the first page, because the less views it gets I think the less trustworthy it is, but then as soon as you go on a site and it has these acai berries and stuff it really irritates me and I find it less trustworthy, even though its probably the only way these websites can stay on the first page I just find them really, there are those adverts and its like get stacked in 4 weeks and stuff and obviously those things are not health related and they are not you know they wouldn't work with most people so if it has those adverts then I think the website hasn't really taken on what the adverts are and how they portray the website. Like up here it has eastcoast, there is nothing wrong with eastcoast, its just a train line. But if you are trying to talk about healthy eating and you have not necessarily great diet things that can be taken the wrong way I think it reflects on the actual website. It's a bit um, uninviting.

AF: What sort of impression do the adverts give you

P: A bad one I guess, it does depend on the type of advert but if it is the ridiculous diet ones then they are not questioning the genuinacy of the adverts or the genuinacy of the content.

AF: Would you be looking on there to see where it was from, or would you not even stay on and read.

P: I would probably read but if it was just stating things and saying it was right I don't think I would believe it unless it was something really obvious, but then you would probably already know.

AF: Do you look for that, if you go to one website and it say something and then another says the same and then another, do you look at that and think.

P: Yeah because it is more likely to be definitely proven but I don't think I would take it just from one website which isn't really very well known, because the amount of stuff on the internet is just totally, about health which is not right or really dramatic and you could definitely freak yourself out.

AF: That's one of the motives for doing this study. Do feel free to go onto the second page. Or if there is something that you want to specifically look at then change the search terms.

P: Right, see I wouldn't go on things like Tesco Diets, there was one of the other site which was marks and Spencers because they are going to say buy our blar blar, its totally motive whereas the government ones will just be like this what is going on and stuff.

AF: Do you want to know the research behind it and where the information has come from?

P: Yeah, and I don't want one which is totally bias to their company which you know that they are going to be. I trust this one as well.

AF: Is that a charity or organisation you are familiar with?

P: Yeah, and you know that they have an end purpose so if you're, they don't want people to get heart conditions, so if you are healthy eating then there are going to be less people getting heart conditions, like with the NHS, it kind of benefit them if you don't get so many people who are over weight so you kind of trust what they are saying will actually. And there is research and legitimate findings behind it because they have the means to do that.

AF: Do you like how this one is presented?

P: Yeah I think this is quite welcoming and stuff and it has a lot of white space so you don't feel like you are bombarded. I think even a child could look at this, like the 5-portions a day stuff. It has healthy eating on a budget which the others haven't and it can be quite expensive to eat fresh fruit and stuff so that's good. Yeah like keep them frozen and stuff to keep them fresh. And the fact that it highlights that tinned fish still contains omega-3. It's good that it points out ways to save money, which is helpful as I didn't really know that. Most of the other ones do have managing your weight, its good that it has dieting myths as there is so much out

there. It's good that it has these because there is a diet with no carbs and one with no protein and I don't believe in all that and its good that it highlights that its not good for you. I think people with weight issues are too quick to jump onto these sorts of things.

AF: When you read information that back up you knowledge how does that make you feel about the rest of the information on the site?

P: It seems a lot more credible but I would give this website a lot of credit because of it cause. Its main cause is to stop heart disease so maybe it seems the most credible of all of them.

AF: Do you think it's good that they focus on thing like salt too?

P: Yeah. It's got like fast food and it's trying to give you alternative options you can make yourself. Although I don't think people just eat fast food because of its taste, it's because its fast so maybe if they give cooking times. It's good about the salt because I don't think many people know, I think people don't take it to seriously but a lot of food already has lots of salt in. I didn't know that about the traffic light colours, so if you see lots of red. It's good that it highlights it because I have never heard of it so it wouldn't mean anything to me.

AF: Does it say where there information is from?

P: I did say that I wouldn't really go onto the second page but that was. I wouldn't go onto the Daily Mail as its got such a reputation for anything that causes drama. Sometimes I would look at specific sites with recipes on, but healthy recipes. These things really annoy me though.

AF: Do the adverts do the same thing?

P: Not really because they are not giving you food advice but they are a bit annoying, they are not diet ones which is good as that would put me off. Sometimes you find

things that you thought were bad for you actually aren't. But then you wonder because its not a legit website whether they are being honest.

AF: Would you ever further research this?

P: It depends how bored I was. A lot of these have some quite expensive recipes so they don't take into account a budget.

AF: So if those healthy eating on a budget ones came with recipes would that be helpful?

P: yeah, especially as a student. Because I can't afford goats cheese and stuff.

AF: What information would you want on sites offering recipes.

P: They could give the calorie count, the portions as well. Not really sure about my calorie account, some of the pasta things like carbonara and I have wondered how is that possible as they are bad for you. Maybe its because a lot of diets have a treat day but they should specify that.

AF: Would you be interested in knowing how many of your 5-a-day is in a recipe?

P: Yeah maybe but if you make it but then you see it in front of you and it should be quite easy to work out.

AF: Do you feel quite confident in knowing what a portion is then?

P: Yeah like one fruit or one piece of vegetable. I am not sure I actually trust that about juice, if I have a glass of orange juice I wouldn't treat it like eating an orange.

AF: Would you like to be able to check those myths out?

P: Yeah but it would have to be a legit website, because it doesn't take long before you come to the websites that aren't legit which is why I generally don't go past the first page.

AF: What about ones like this?

P: No I wouldn't, for the start slimming world, it doesn't sound like healthy eating is its goal it sounds like mass losing weight is the goal but the name puts me off. Sainsbury's diets I wouldn't as I think it would be bias to Sainsbury's. Allrecipes sounds quite neutral. Its good that it includes these things for people who are diabetic or allergic to gluten. Like chilli I wouldn't have thought, like chilli con carne I don't class as a healthy food.

AF: Does that make you question yourself or the website?

P: A bit of both, I would probably type it into google and see, it's probably how it's cooked

AF: Just going to show you another one, are you familiar with change for life?

P: I have heard of it, its obviously really good for getting kids involved with the colours and the layout and not too much information. Its obviously aimed at families which is good but for me I wouldn't want something simplified down that much but I can see its important to have these websites because I can see with McDonalds and stuff it is quite hard to get the kids involved. yeah, it says that the juice does count as long as it doesn't come from concentrate, it is good but I still see it as like childish.

AF: Would it be better to make something like that more clear?

P_: Yeah because I didn't notice that. It says 30g and then 80g but it doesn't really say what is classed as a portion. The quizzes and things are good because people will take more involvement if there are things to do. Its good that its not just about food but it has a balance with exercise as well. Its good that it sends you to other places as well, which gives you a bit more of a legitimate feel. Its obviously not just for kids

because it tells you about alcohol and stuff, but it does have a childish appeal and that might put some people off.

AF: Would it make more sense for the adults page to have a different style?

P: They could kepe it yellow and stuff but if it had no writing and you had to guess I think most people would say its for kids. I would take away the cartoons because I think adults want it to be a bit more serious but not as serious as the directgov one.

AF: A balance, is there anything else that you think is important?

P: Not that I can think of.

10.15 Study 5 SPSS main data tables

Main effect of condition ANCOVA

Tests of Between-Subjects Effects

Dependent Variable:Mean_7Day

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	74.828[a]	2	37.414	81.913	.000	.704
Intercept	43.029	1	43.029	94.205	.000	.577
Baseline_FV	63.947	1	63.947	140.003	.000	.670
Condition	22.594	1	22.594	49.466	.000	.418
Error	31.516	69	.457			
Total	909.204	72				
Corrected Total	106.344	71				

a. R Squared = .704 (Adjusted R Squared = .695)

Effect of condition on other dependent measures

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Intent_Mean	Between Groups	48.342	1	48.342	141.562	.000
	Within Groups	23.904	70	.341		
	Total	72.247	71			
Zscore_MC_Mean	Between Groups	20.936	1	20.936	85.969	.000
	Within Groups	17.047	70	.244		
	Total	37.982	71			
Resp_Efficacy_Mean	Between Groups	2.676	1	2.676	3.936	.051
	Within Groups	47.601	70	.680		
	Total	50.278	71			
Self_Efficacy_Mean	Between Groups	1.096	1	1.096	5.799	.019
	Within Groups	13.236	70	.189		
	Total	14.332	71			

3 way ANOVA

Multivariate Tests[b]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Pre_Post	Pillai's Trace	.369	39.706[a]	1.000	68.000	.000	.369
	Wilks' Lambda	.631	39.706[a]	1.000	68.000	.000	.369
	Hotelling's Trace	.584	39.706[a]	1.000	68.000	.000	.369
	Roy's Largest Root	.584	39.706[a]	1.000	68.000	.000	.369
Pre_Post * Condition	Pillai's Trace	.409	47.046[a]	1.000	68.000	.000	.409
	Wilks' Lambda	.591	47.046[a]	1.000	68.000	.000	.409
	Hotelling's Trace	.692	47.046[a]	1.000	68.000	.000	.409
	Roy's Largest Root	.692	47.046[a]	1.000	68.000	.000	.409
Pre_Post * Low_High	Pillai's Trace	.345	35.780[a]	1.000	68.000	.000	.345
	Wilks' Lambda	.655	35.780[a]	1.000	68.000	.000	.345
	Hotelling's Trace	.526	35.780[a]	1.000	68.000	.000	.345
	Roy's Largest Root	.526	35.780[a]	1.000	68.000	.000	.345
Pre_Post * Condition * Low_High	Pillai's Trace	.074	5.473[a]	1.000	68.000	.022	.074
	Wilks' Lambda	.926	5.473[a]	1.000	68.000	.022	.074
	Hotelling's Trace	.080	5.473[a]	1.000	68.000	.022	.074
	Roy's Largest Root	.080	5.473[a]	1.000	68.000	.022	.074

a. Exact statistic

b. Design: Intercept + Condition + Low_High + Condition * Low_High

Within Subjects Design: Pre_Post

Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	1252.670	1	1252.670	942.518	.000	.933
Condition	8.228	1	8.228	6.190	.015	.083
Low_High	134.609	1	134.609	101.281	.000	.598
Condition * Low_High	4.612	1	4.612	3.470	.067	.049
Error	90.377	68	1.329			

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8. Condition * Low_High * Pre_Post

Measure:MEASURE_1

Condition	Low_High	Pre_Post	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Personal Opinion	Low	1	1.467	.236	.996	1.938
		2	1.733	.224	1.287	2.180
	High	1	4.125	.187	3.753	4.497
		2	3.762	.177	3.409	4.115
Self Affirmation	Low	1	1.526	.210	1.108	1.945
		2	3.383	.199	2.987	3.780
	High	1	3.857	.244	3.370	4.345
		2	4.276	.232	3.813	4.738

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