

**IMPROVING THE EATING BEHAVIOURS OF
PRIMARY SCHOOLCHILDREN**

Sue Moore

This thesis is submitted in candidature
for the degree of Doctor of Philosophy

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CANDIDATE'S ID 0525854
NUMBER

CANDIDATE'S SURNAME Mrs
MOORE

CANDIDATE'S FULL SUSAN
FORENAMES

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SUMMARY

Socio-ecological health improvement approaches, such as Health Promoting Schools, emphasise the dynamic inter-relationships between individuals and environments, such as children's experiences with food in school. Evaluating previous school-based nutritional interventions from a socio-ecological perspective suggests areas where macro policy is ineffective in influencing children's eating behaviour (e.g., some children remain unwilling to consume healthier food). On the other hand, promising results have been obtained from interventions based on the social interactions between children and school meal staff. The aim of this thesis is to explore how school-based nutritional policies might realise health improvements through understanding the policy and environmental contexts associated with school dining halls, together with the influences on children's eating behaviour of the feeding strategies employed by school meal staff.

A qualitative case study was conducted in one Welsh Local Education Authority (LEA). Observations were carried out in eleven primary school dining halls, supplemented by interviews with participants at multiple socio-ecological levels.

LEA and school policies reflected national objectives with respect to nutritional guidelines, but were influenced by multiple, competing interests including pupil's food preferences, and organisational objectives such as protecting school meal uptake. Some dining hall features (e.g., accommodation, negative teacher modelling) had an adverse influence on eating behaviour and many children failed to select and/or consume nutritionally balanced meals. The feeding strategies used by school meal staff were used naturally but inconsistently and were subject to contextual constraints (e.g., time pressures).

Higher level policy interventions may have limited effectiveness if undermined by lack of attention to lower level factors compromising their effectiveness. Behavioural approaches based on repeated taste exposure to encourage children to *taste* the nutritionally balanced meals made available by school meal policies are recommended. As utilising teachers during lunchtimes may be problematic, enrichment of the feeding interactions between school meal staff and children is suggested.

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Chapter 1 Introduction

1.1 Overview

The association between deteriorating nutritional behaviour and increased morbidity and mortality represents a major public health challenge. Explanations of health and behaviour consider human development and the identification of health determinants, and recognise the importance of social ecology – the interaction between individuals and the environment. It arguably follows that if the public health *challenge* exhibits socio-ecological characteristics, adopting a socio-ecological perspective may be one approach towards the formulation of effective public health *solutions*. Indeed, health improvement policies have engaged with socio-ecological (SE) theory by defining the need to empower individuals to take control of their health by creating supportive environments. To this end, Health Promoting Schools (HPSs), which are specifically organised around SE principles in support of health improvement objectives, have played a longstanding and prominent role within policy. In order to address the SE challenges inherent within health improvement policy, a number of SE frameworks exist. The framework that most comprehensively encapsulates the objectives of health improvement policy and the HPS, as well as the theories that underpin them is that proposed by McLeroy and colleagues (McLeroy, Bibeau, Steckler, & Glanz, 1988). This framework identifies multiple, inter-related leverage or evaluative points at policy, community, organisational, inter-personal and intra-personal levels that mirror the multi-level structures identified within SE theories of human development and the determinants of health.

At the policy level, healthy eating is an integral part of the mandatory school curriculum in Wales and Scotland, and proposals are underway for it to be so in England. However, education alone has been shown to be ineffective in influencing children's eating behaviour. 'Whole school' education approaches, meanwhile, emphasise the importance of the wider school context. For example, consideration of the complementary role of the school meal service is one criterion for formal membership of the network of HPSs in England, Scotland and Wales. Indeed, the transformation of the school meal service, particularly with respect to the nutritional content of school meals, is currently high on policy agendas. However, early indications are that even if nutritionally balanced meals are

available, some children fail to consume them. On the other hand, promising results have been obtained from interventions at the inter-personal level where the social interactions between school meal staff and children have been used as opportunities to encourage children's eating behaviour. This suggests the importance of considering these policy initiatives *in conjunction with* what has been learned about the processes involved in influencing eating behaviour, and how these are known to operate in other contexts, relationships and SE levels. To this end, the aims of this thesis are; a) to understand the school meal context and its implications for nutritional policy and primary schoolchildren's (age 4-11 years) eating behaviour; and, b) to understand the techniques used by school meal staff during social interactions within the primary school meal setting which directly or indirectly impact the children's eating behaviours; and thence to consider the implications for policy and practice.

1.2 Thesis structure

The thesis includes an introduction (this chapter); a literature review which concludes with the research aims and objectives (Chapters 2 and 3); the methodological design (Chapter 4) and method (Chapter 5) used to fulfil the research aims and objectives; the results of the data collection and analysis (Chapters 6 and 7); and, a discussion of the results in the context of the literature which generates a conclusion which includes implications for policy and practice (Chapter 8). Supporting information can be found in the Appendices which are referenced throughout the text. To aid the reader, a glossary of terms is included in Appendix A which complements definitions which appear in the main text when terms are first used.

The objective of Chapter 2 is to explore links between behaviour and health, and present an argument in support of a SE health improvement framework which is then used to evaluate previous nutritional interventions, identifying issues and opportunities that warrant deeper understanding. It begins by reviewing epidemiological data¹ relating to the incidence and social patterning of health behaviours and disease, together with their trends

¹ Data is generally presented separately for England, Scotland, Wales and Northern Ireland (NI) since this reflects the way in which they are captured. As the study upon which the thesis is based took place in Wales, the text gives prominence to data from Wales where possible, whilst presenting data for the rest of the UK in supporting tables for completeness.

over time. These data will establish links between childhood behaviour and adult health, and identify behavioural risk or protective factors that exhibit social patterning with respect to, for example, socio-economic status. Chapter 2 proceeds by reviewing theoretical explanations of human development and the determinants of health, noting the prominence that both explanations afford to social ecology. Consequently, previous health improvement policies and approaches are evaluated from a SE perspective, with particular emphasis on the health promoting school (HPS). Since the challenges facing these policies exhibit SE characteristics, existing SE health improvement frameworks are evaluated against health improvement objectives, culminating in a recommendation that the framework proposed by McLeroy and colleagues (1988) most comprehensively encapsulates these objectives. Thenceforth, the McLeroy model is used as an analytical framework that informs the: literature review; aims and objectives; methodological approach and design; data analysis; discussion of results; and, their respective presentations in this thesis.

Having established the utility of the McLeroy model as one approach to inform health improvement initiatives, Chapter 2 uses it as a framework to evaluate previous school based nutritional interventions that have adopted a largely top-down approach (i.e. where macro policy seeks to influence individual behaviour). In so doing, certain key issues become apparent: a) whereas policy has emphasised the potential of the school meal service to improve the nutritional content of meals and thereby positively influence health, some children are reluctant to consume the healthier meals on offer; b) at the organisational level, the characteristics of school meal contexts have often not been factored into intervention design; c) at the intra-personal level, some behavioural change theories used have been over-reliant on cognitive processes that are under-developed in young children, and some outcomes targeted have lacked any theoretical justification; and, d) multi-component designs have generally not considered the relative importance of the SE processes inherent within them. However, this top-down SE evaluation also reveals that some school based nutritional interventions located at the inter-personal level have had more promising results. Thus, Chapter 2 postulates that if nutritional policy were to trigger these inter-personal processes, more positive behavioural/health improvements may be achieved. To this end, Chapter 3 undertakes a bottom-up SE analysis to consider how nutritional behaviour might be better influenced by policy.

Chapter 3 adopts a psychological perspective to construct a detailed SE framework relating to nutritional behaviour and its development in children. It begins at the intra-personal level with an overview of different perspectives on eating behaviour to justify its emphasis on the psychological literature. It proceeds by defining three important eating behaviours – consumption, choice and liking² – and their relationship to each other. It shows that young children *learn* these behaviours through mechanisms involving social learning, operant conditioning and classical conditioning rather than mechanisms such as Social Cognitive Theory and classroom based learning, upon which most previous interventions have been based. These learning mechanisms are employed at the inter-personal level during feeding strategies invoked within social interactions. Consequently, a taxonomy of feeding strategies is defined – modelling, repeated taste exposure, restriction, pressure and encouragement – as a precursor to a comprehensive review of the literature relating to each strategy. The review examines how feeding strategies influence consumption, choice and liking, considering how current policy initiatives might trigger the SE processes involved. The chapter proceeds by reviewing previous interventions based in home, school and clinical settings that have utilised feeding strategy theory to successfully improve eating behaviour. It is suggested that a knowledge gap exists with respect to whether and/or how such strategies are used by school meal staff in school dining halls such that their potential to complement school meal policy may have been overlooked. Chapter 3 then focuses on the organisational level and identifies further SE processes that influence nutritional behaviour. For example, ecologies of practice are processes whereby professional practices confound policy objectives at the point of delivery, suggesting a further knowledge gap regarding their effect within the school meal service. The chapter concludes by examining the physical, social and temporal aspects of environments and their influence on eating behaviour to reveal a further knowledge gap with respect to their influence on school nutritional policy. This bottom-up SE evaluation is then merged with the top-down evaluation undertaken in Chapter 2 to derive the research aims and objectives which seek to strengthen the relationship between nutritional policy and behaviour by eliminating the issues identified, and exploring opportunities identified at other SE levels.

² Strictly speaking, liking is not a behaviour but an affective response to food. It is included within the descriptive term ‘eating behaviour’ throughout this thesis to aid readability.

The objective of Chapter 4 is to construct the methodological paradigm to be applied to the thesis together with the methods used. Informed by the SE health improvement frameworks and issues foreshadowed within the literature review, the thesis will be aligned with an ontological position of critical realism supported by a social constructivist epistemology and a qualitative methodology. The chapter proceeds by establishing observation and interviewing as the research methods most suited to the research questions. Chapter 4 then defines the raw data forms that the research method will generate as: semi-structured observational fieldnotes; interview transcripts; documents that define the contextual background; and, a reflexivity journal. The chapter concludes by discussing the ethical implications of the study and the project plan.

Chapter 5 builds upon the methodological paradigm presented in Chapter 4 by describing the research protocols used and their relationship to the research questions and the SE framework upon which the research was based. Throughout this chapter, extensive reference is made to the research materials included in the Appendices. It begins by defining the recruitment strategy and justifying the decision to conduct a case study of one LEA within Wales. The recruitment procedures and study sample are then described in detail, followed by the procedures adopted during the observations, interviews and focus groups with children, and the method of data analysis.

Findings from the study are presented in Chapters 6 and 7 using a separate sub-section for each research question. The chapters and sections within them allow the emerging narrative to construct a SE understanding of the exploratory aims and objectives. Chapter 6 focuses on organisational level processes associated with the school meal context. The first two sub-sections present the findings related to the pragmatic influences that affect the food available at school mealtimes, thence the professional practices which further influence food availability. This is followed by a further section relating to the use of pupil consultation within healthy eating policy. Chapter 6 concludes by presenting the findings relating to the environmental characteristics of the school dining hall. The emphasis on Chapter 7 is on the inter- and intra-personal processes that impinge upon eating behaviour in the dining hall. It comprises of three sections that present the findings relating to primary schoolchildren's responses to healthy eating, followed by the feeding outcomes

sought by school meal staff and the strategies used to achieve them. Chapter 7 concludes by re-presenting these data organised at school level.

Chapter 8 discusses the research findings presented in Chapters 6 and 7 in the context of the literature reviewed in Chapter 2 and 3, and the methodological approach presented in Chapters 4 and 5. The chapter begins by discussing the implications of adopting a SE perspective noting the unique contribution of the study to health improvement knowledge, whilst acknowledging its methodological limitations. The discussion then moves to the policy level regarding the barriers associated with implementing healthy eating policies in Wales, followed by the challenges associated with children's responses to healthy eating and pupil consultation. As these challenges represent negative reciprocal influences between children and policy, the potential to offset them by processes operating at the organisational and inter-personal levels is then discussed. At the organisational level, these processes concern the contextual implications of school dining halls with respect to the opportunities to improve eating behaviour; resource constraints which deter from the eating experience; and, their contextual heterogeneity. The emphasis then moves to the inter-personal level by discussing the utility of the learning mechanism that underpin feeding strategies as a theoretical basis for nutritional interventions in primary school that could complement healthy eating policies. The discussion proceeds by considering the recommendations made in the context of the HPS philosophy. It concludes by evaluating the research quality before presenting some reflections on researching in the field followed by the opportunities that arose during the study for knowledge transfer. Chapter 8, and the thesis, concludes by discussing the study's implications for policy and practice.

Chapter 2 Health improvement and school nutrition

2.1 Dietary behaviour and health

Mortality and morbidity associated with chronic conditions such as heart disease and cancer is influenced by a range of factors including treatments available; detection mechanisms; behaviour modification strategies; and, tackling inequalities in their incidence (Department of Health, 2000, 2007). Diet, physical inactivity, smoking and excessive alcohol consumption are risk behaviours for chronic diseases and their risk factors, such as cardiovascular disease (CVD), many common cancers, type 2 diabetes, overweight/obesity, hypertension and hyperlipidemia (National Institute for Health and Clinical Excellence, 2010). Over the past two decades, deteriorating nutritional behaviour and increasingly sedentary lifestyles together with their association with increased morbidity and mortality in both developed and developing countries have attracted attention on a global scale (World Health Organisation, 2003a). The associated challenges to public health have concerned policymakers worldwide, both within the regional offices of the World Health Organisation (WHO) (e.g., WHO Regional Office for Europe, 2001), and within national governments, including those of England (Department of Health, 2005), Scotland (Scottish Executive, 2004) and Wales (Food Standards Agency Wales, 2003). Consequently, health behaviours, such as diet, are high on the agendas of health and public sector professionals; academics; and, charitable organisations, at national, local and community levels (Faculty of Public Health, 2005). In order to control health problems, epidemiologists aim to understand the distribution of disease and associated risk/protective factors (Nutbeam, 1998b). To facilitate this, regular surveys are conducted within the UK which give visibility to the incidence, prevalence and social patterning of non-communicable diseases, together with their trends over time.

2.1.1 The prevalence of heart disease, cancer and obesity

Mortality rates associated with heart disease have been in decline since 1978 (Office for National Statistics, 2010a), yet it remains a leading cause of death in the UK (Office for National Statistics, 2009) and is considered a major public health problem (National Institute for Health and Clinical Excellence, 2010). The number of adults receiving treatment for heart conditions in England, Scotland, Wales and NI are shown in Table 1.

IMPROVING THE EATING BEHAVIOURS OF PRIMARY SCHOOLCHILDREN

Table 1 Prevalence of heart conditions, cancer and obesity in the UK

	England	Scotland	Wales	NI
All adults				
Heart conditions	5.2%	-	9.0%	(7.0%, 3.0%) ¹
Overweight	38.3%	-	36.0%	35.0%
Obese	23.0%	-	21.0%	24.0%
Overweight and obese	61.3%	-	57.0%	59.0%
Men				
Heart conditions	6.5%	8.7%	10.0%	(7.0%, 4.0%) ¹
Newly diagnosed cancers ²	409	443	462	422
Overweight	43.7%	42.4%	41.0%	-
Obese	22.1%	26.1%	21.0%	-
Overweight and obese	65.8%	68.5%	62.0%	-
Women				
Heart conditions	4.0%	7.5%	8.0%	(6.0%, 2.0%) ¹
Newly diagnosed cancers ²	355	389	379	346
Overweight	32.8%	34.3%	31.0%	-
Obese	23.9%	27.5%	21.0%	-
Overweight and obese	56.7%	61.8%	53.0%	-

NOTES:

The data relating to heart conditions are not directly comparable since they were derived from different data sources over different time periods as follows:

England - Health Survey for England 2009 (The Health and Social Care Information Centre, 2010b)

Scotland - Scottish Health Survey 2009 (The Scottish Government, 2010b)

Wales - Welsh Health Survey 2009 (Welsh Assembly Government, 2010b)

NI - Northern Ireland Health and Social Wellbeing Survey 2001 (Northern Ireland Statistics and Research Agency, 2002)

In England, NI and Scotland, the data relate to ischaemic heart disease (IHD) only, i.e., angina and heart attacks, whereas in Wales, they relate to heart attacks, angina, heart failure or any other heart condition.

¹Figures in brackets relate to angina and heart attacks as consolidated data are not available

²Data relate to incidence rates per 100,000 population and represent the three year average for 2005-7.

Source: (Office for National Statistics, 2010b)

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The prevalence of heart conditions in Wales has been stable at 9% since 2004/5 (Welsh Assembly Government, 2010b). Between 1995-2009, the prevalence of CVD in Scotland has fluctuated, however, in males, when considered in conjunction with diabetes, prevalence has increased from 9.4% to 12.6% (The Scottish Government, 2010b). Adults diagnosed with CVD are more likely to be former smokers, although smoking and excess alcohol consumption are more prevalent in those without CVD, which may be an indication that diagnosis prompts behaviour change (The Scottish Government, 2010b). Whereas 50% of the decline in IHD is attributable to behavioural change, 50% is attributable to improved diagnosis, treatment and care (Department of Health, 2000). All four UK countries report that the incidence of heart related conditions increases with age (Northern Ireland Statistics and Research Agency, 2007; The Health and Social Care Information Centre, 2010a; The Scottish Government, 2010b; Welsh Assembly Government, 2010b). The most detailed analysis of socio-economic patterning associated with the incidence of heart disease has been conducted in Scotland where comparisons have been made on the basis of: a) household NS-SEC categorisation; b) equivalised household income; and c) the SIMD (The Scottish Government, 2010b). This analysis shows that the prevalence of IHD is highest in areas of high deprivation, low income and in the lower NS-SEC categories. The incidence of heart conditions in Wales is also higher in the lower NS-SEC categories (Welsh Assembly Government, 2010b). Further inequalities are associated with ethnicity and geographical area (Department of Health, 2000).

Cancer remains the second leading cause of death, accounting for 28% of all deaths in England and Wales during 2008 (Office for National Statistics, 2009). The average number of newly-diagnosed cases of cancer per annum in the UK population during 2005-7 was 415 males and 359 females per 100,000 population (Office for National Statistics, 2010b). Separate figures for England, Scotland, Wales and NI can be found in Table 1. During the same period, UK mortality rates were 214 males and 154 females per 100,000 population. Breast cancer in females and prostate cancer in males are the most common forms of cancer, followed by lung, then colorectal cancer. Trend analyses show that during the period 1993-2004, the incidence of cancer in the UK declined by 1% in males but increased by 4% in females. Over the same period, cancer related mortality declined by 15% (males) and 11% (females) (Westlake & Cooper, 2008). Half of all cancers are

preventable by lifestyle (Department of Health, 2007). Smoking is the single largest preventable risk factor for cancer, with obesity and excessive alcohol consumption also being strong contributory factors. Early detection is critical for increasing survival rates and screening is available for breast, bowel and cervical cancer. Timely treatment via surgery, radiotherapy and drugs is also essential for survival. In Scotland, both incidence and mortality rates due to cancer are associated with areas of high deprivation (Information Services Division Scotland, 2009). Furthermore, in the UK as a whole, gender has been significantly associated with cancer as trend analyses dating back to 1993 have shown that males are more at risk than females (Cancer Research UK, 2009; Westlake & Cooper, 2008). Inequalities in cancer incidence, access to services and outcomes exist with respect to age, gender, deprivation, religion, disability and sexual orientation (Department of Health, 2007).

Obesity results from excess energy levels i.e. the difference between energy intake and energy expenditure (Defra, 2008). In Wales, 57% of adults are overweight, obese or morbidly obese (Welsh Assembly Government, 2010b). Comparative figures for England, Scotland and NI are presented in Table 1 and are based on measurements of Body Mass Index (BMI) such that 'overweight' equates to a BMI of 25+ to less than 30, and 'obese' equates to a BMI of 30+. Since the inception of the Health Surveys upon which Table 1 is based, levels of overweight and obesity in England, Scotland and Wales have been increasing (trends for NI are unavailable) although levels in England are now beginning to stabilise (The Health and Social Care Information Centre, 2010a). Indeed, rising levels of obesity have variously been described as the climate change of public health (Foresight, 2007) and a time bomb (Department of Health, 2010b), which is a concern as obesity is known to be difficult to treat (Bosch, Stradmeijer, & Seidell, 2004). Maintaining a healthy weight is an important protective factor against cancer (World Cancer Research Fund, 2007), and CVD (The Health and Social Care Information Centre, 2010a; The Scottish Government, 2010b). Being overweight and sedentary is also associated with type 2 diabetes which accounts for an estimated 5% of UK health expenditure (National Institute for Health and Clinical Excellence, 2010). However, weight regulation is influenced by the complex interplay between numerous biological, psychological, environmental and cultural factors (Cross-Government Obesity Unit. Department of Health and Department of Children Schools and Families, 2008). Throughout the UK, levels of obesity (including

overweight) are higher in men than women and rise steadily through adulthood (age 16+), reaching a peak in later life (age 45-74). Obesity levels also exhibit social patterning such that, in Wales, they are lower in the highest socio-economic grouping as assessed by occupational categorisation using the National Statistics Socio-Economic Classification (NS-SEC) relating to the household reference person (i.e. professional and managerial workers) (Welsh Assembly Government, 2010b). When assessed in terms of equivalised household income, in England obesity levels are higher in the lowest income categories (The Health and Social Care Information Centre, 2010a).

2.1.2 The prevalence of health behaviours

The UK health surveys also give visibility to the incidence, prevalence and social patterning of health behaviours associated with non-communicable diseases which include smoking, physical activity, alcohol consumption and nutrition. Although smoking in the UK is declining (The Health and Social Care Information Centre, 2010a; The Scottish Government, 2010b; Welsh Assembly Government, 2010b), data from England suggest that social inequalities in smoking behaviour are becoming more pronounced. In England and Wales, 57% and 45% respectively exceed recommended levels of alcohol intake at least one day a week (The Health and Social Care Information Centre, 2010a; Welsh Assembly Government, 2010b). In Scotland, excess alcohol consumption is declining and the majority of adults are now classed as moderate drinkers (The Scottish Government, 2010b). Only 37% of adults achieve the recommended levels for physical activity in Scotland (The Scottish Government, 2010b), 29% in Wales (Welsh Assembly Government, 2010b) and 34% in England (The Health and Social Care Information Centre, 2010b). Health has also been associated with diet and nutritional behaviour.

A diet that is mostly made up of foods of plant origin that are high in nutrients and dietary fibre, and low in energy density (e.g., non-starchy vegetables, fruit, grains, pulses) acts as a protective factor against cancer (World Cancer Research Fund, 2007). Similarly, a diet based on fruit, vegetables, grains, fish, poultry and pulses is suggested to be a protective factor for CVD (National Institute for Health and Clinical Excellence, 2010). On the other hand, a diet high in saturated fats is a risk factor for CVD (National Institute for Health and Clinical Excellence, 2010), and a diet high in salt is a probable risk factor for some cancers (World Cancer Research Fund, 2007). Salt also increases blood pressure, which is itself a

risk factor for both heart disease and stroke (National Institute for Health and Clinical Excellence, 2010). Furthermore, the level of dietary intake is associated with the prevalence of obesity (Chaudhury et al., 2008) which is a significant risk factor for CVD, coronary heart disease (McGee & Diverse populations collaboration, 2005), stroke and type 2 diabetes (World Health Organisation, 2003a). The evidence is indicative, therefore, of an association between diet, and CVD, stroke and cancer, chronic diseases which accounted for 61% of all deaths in England and Wales during 2008 (Office for National Statistics, 2009)

In 1991, Recommended Daily Amounts (RDA) for food energy and nutrients aimed at subgroups of the healthy population in the UK were established (Department of Health, 1991). These RDAs for healthy adults, together with actual daily intakes are shown in Table 2. These data, which relate to the UK as a whole, show that total energy intake and consumption of non-milk extrinsic sugars (NMES), protein and fat (in males), exceeds recommendations, whereas consumption of dietary fibre falls short of them.

Table 2 Average daily consumption for adults aged 19-64 years in the UK in comparison with recommended values

	Recommended Daily Amounts ¹		Average daily intake 2000/1 ²			Average daily intake 2008/9 ²		
	Men	Women	Men	Women	All Adults	Men	Women	All Adults
Energy (kcal/day)	2550 ³	1950 ³	2308	1635	1934	2255	1645	1949
Protein (g/day)	55.5 (53.3) ⁴	45.0 (46.5) ⁴	87.6	63.6	74.2	88.4	66.3	77.3
Total fat ⁵	35.0 ⁶	35.0 ⁶	35.5	34.7	35.1	35.5	34.7	35.1
Carbohydrate ⁵	50.0 ⁶	50.0 ⁶	48.0	48.7	48.4	46.8	47.8	47.3
- Intrinsic and milk sugars and starch ⁵	39.0 ⁶	39.0 ⁶	34.4	36.7	35.7	33.8	35.7	34.8
- NMES ⁵	11.0 ⁶	11.0 ⁶	13.5	12.0	12.7	13.0	12.1	12.5
NSPs (g/day)	18.0 ⁶	18.0 ⁶	15.5	12.6	13.8	15.1	13.0	14.0
Sodium (mg/day)	1610 (1610) ⁴	1610 (1610) ⁴				2800	2038	2418

NOTES

¹ Source: (Department of Health, 1991) ; ² Source: National Diet and Nutrition Survey (Food Standards Agency & Department of Health, 2010b)

³ Estimated Average Requirement (EAR) for adults aged 19-50

⁴ Reference Nutrient Intake (RNI) for adults aged 19-50. Figures in brackets relate to adults aged 50+

⁵ Expressed as a percentage of food energy; ⁶ Dietary Reference Value (DRV) for the population average

NMES = Non-milk extrinsic sugars NSP = Non-starch polysaccharides, considered the best measure of dietary fibre

Definitions of the terms used in this table can be found in the Glossary in Appendix A

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During 2008/9, adults aged 19-64 in the UK consumed an average of 24g fish, 113g meat, 195g vegetables and 99g fruit per day (Food Standards Agency & Department of Health, 2010b). Policy guidelines for fruit and vegetable (F/V) intake are represented as a recommendation to eat at least five 80g portions of fruit and/or vegetables per day (Department of Health, 2010a). Regular health surveys conducted in England, Scotland, Wales and Northern Ireland (NI) monitor behaviour and demographics associated with the '5-a-day' target such that this facet of nutritional behaviour is information rich. Consumption patterns from the most recent surveys are shown in Table 3.

Table 3 Daily fruit/vegetable consumption amongst adults in the UK

Daily consumption	England ¹	Scotland ²	Wales ³	NI ⁴
All adults				
None	6%	9%	7%	-
5+ portions	26%	23%	35%	27%
Men				
None	7%	10%	8%	-
5+ portions	25%	22%	34%	22%
Women				
None	6%	7%	7%	-
5+ portions	28%	25%	37%	31%

NOTES:

Figures are based on reports of consumption levels during the previous day except for Northern Ireland where self-reports of average consumption are used

¹ Source: Health Survey for England 2009 (The Health and Social Care Information Centre, 2010b)

² Source: Scottish Health Survey 2009 (The Scottish Government, 2010b)

³ Source: Welsh Health Survey 2009 (Welsh Assembly Government, 2010b)

⁴ Source: Northern Ireland Health and Social Wellbeing Survey 2005/6 (Northern Ireland Statistics and Research Agency, 2007)

Although data are presented for England, Scotland, Wales and NI, they should not be regarded as directly comparable as they were collected by different agencies, using differing methodologies, over differing timeframes. Nevertheless, the data show that F/V consumption in all four countries falls below the 5-a-day recommendation, irrespective of age or gender. Women generally consume more than men, and the highest proportion of

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adults meeting the 5-a-day target occurs in the older (65+) population in England, Scotland and NI (Northern Ireland Statistics and Research Agency, 2007; The Health and Social Care Information Centre, 2010b; Welsh Assembly Government, 2010b), and in the 55-64 age group in Scotland (The Scottish Government, 2010b). Socio-economic trends are also evident in that F/V consumption declines in lower socio-economic groups³ (The Health and Social Care Information Centre, 2010a; The Scottish Government, 2009b; Welsh Assembly Government, 2010b).

The data suggest, therefore, that dietary behaviours such as the consumption of saturated fats or salt are amongst the risk factors for chronic disease, whereas the consumption of foods of plant origin are amongst the protective factors. Furthermore, levels of dietary intake are associated with obesity which is itself a significant risk factor for some chronic diseases. Implicit in these associations is the potential to reduce the incidence of risk factors or increase the incidence of protective factors as one approach towards the prevention of disease. To this end, the World Health Organisation (WHO) defines five life-stages associated with the prevention of chronic disease - pre-natal, infancy, childhood and adolescence, adulthood and old-age. The human life-course, therefore, represents a continuous spectrum of opportunities for health improvement and the development of cumulative risk suggesting the importance of understanding the life-stages that precede adulthood (World Health Organisation, 2003a).

³ Socio-economic status (SES) is assessed as follows:
England – via equivalised household income; Wales – via the National Statistics Socio-Economic Classification (NS-SEC) relating to the household reference person ; Scotland – via both of the above plus the Scottish Indicator of Multiple Deprivation (SIMD)

2.1.3 Childhood dietary behaviour and health in adulthood

Behavioural risk factors that are associated with health have an impact throughout the lives of individuals, and a more profound impact the earlier they are exhibited (World Health Organisation, 2003a). For example, some dietary behaviours emerge early in life and are subsequently maintained in later life. Furthermore, intergenerational effects include underweight mothers having low birth weight babies, and diabetic mothers having high birth weight babies that develop into overweight children. In the developmental spectrum, childhood and adolescence are increasingly regarded as critical periods for the establishment of healthy behaviours as preventive measures for adult onset cancers (Fuemmeler, Pendzich, & Tercyak, 2009). Thus, behaviours acquired in childhood which persist into adulthood have a cumulative effect on health. Childhood is a period where developmental change is more rapid than adulthood and has specific nutritional requirements.

Dietary reference values (DRVs) for children aged 4-18 years are shown in Table 4. For some nutrients, separate DRVs are defined for children aged 0-3 months; 4-6 months; 7-9 months; 10-12 months; 1-3 years; 4-6 years; 7-10 years, 11-14 years and 15-18 years (Department of Health, 1991).

Table 4 Dietary reference values for children aged 4-18 years in the UK

	4-6 years	7-10 years	11-14 years	15-18 years
Energy (kcal/day) ¹	Boys: 1715	Boys: 1970	Boys: 2220	Boys: 2755
	Girls: 1545	Girls: 1740	Girls: 1845	Girls: 2110
Protein (g/day) ²	19.7	28.3	Boys: 42.1	Boys: 55.2
			Girls: 41.2	Girls: 45.0
Total fat ³	35.0 ⁴	35.0 ⁴	35.0 ⁴	35.0 ⁴
Carbohydrate ³	50.0 ⁴	50.0 ⁴	50.0 ⁴	50.0 ⁴
- Intrinsic and milk sugars and starch ³	39.0 ⁴	39.0 ⁴	39.0 ⁴	39.0 ⁴
- NMES ³	11.0 ⁴	11.0 ⁴	11.0 ⁴	11.0 ⁴
Sodium (mg/day) ²	690	1150	1610	1610

NOTES:

¹ Estimated Average Requirement (EAR)

² Reference Nutrient Intake

³ Expressed as a percentage of food energy

⁴ Dietary Reference Value (DRV) for the population average

NMES = Non-milk extrinsic sugars

NSP = Non-starch polysaccharides, considered the best measure of dietary fibre

Average daily consumption patterns of children in the UK aged 4-18 are shown in Table 5. Data for 2008/9 show that children in this age group received 16-17% of their daily energy intake from sugar, which, although a downward trend, remains in excess of the Estimated Average Requirement (EAR) of 11% (Food Standards Agency & Department of Health, 2010a). Although total fat intake continued to approximate to the DRV of 35% per day, 12.9% of this was in the form of saturated fatty acids, for which the DRV is 11% per day.

Table 5 Average daily consumption for children aged 4-18 years in the UK

	1997				2008/9			
	Boys		Girls		Boys		Girls	
	4-10 years	11-18 years	4-10 years	11-18 years	4-10 years	11-18 years	11-18 years	11-18 years
Energy (kcal/day)	1680	2130	1510	1660	1591	2154	1523	1668
Protein (g/day)	53.0	70.5	48.4	54.6	57.7	77.1	54.3	58.9
Total fat ¹	35.4	35.6	35.9	36.0	34.0	34.5	35.0	35.7
Carbohydrate ¹	52.0	51.0	51.2	50.8	51.5	50.7	50.6	49.8
- Intrinsic and milk sugars and starch ¹	34.6	34.6	34.2	35.0	37.1	34.4	35.9	34.8
- NMES ¹	17.2	16.4	17.0	15.8	14.4	16.3	14.7	15.0
NSPs (g/day)	9.8	12.5	9.0	10.4	11.2	13.1	10.3	10.8
Sodium (mg/day)					2007	2717	1864	2089

NOTES

Source: National Diet and Nutrition Survey (Food Standards Agency & Department of Health, 2010b)

¹ Expressed as a percentage of food energy

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The average daily consumption of vegetables, fruit, meat and fish for children aged 4-18 years in the UK is shown in Table 6.

Table 6 Average daily consumption of vegetables, fruit, meat and fish for children aged 4-18 years in the UK

	Boys		Girls	
	4-10 years	11-18 years	11-18 years	11-18 years
Vegetables (g/day)	100	124	97	104
Fruit (g/day)	78	73	106	59
Meat (g/day)	71	119	70	84
Fish (g/day)	12	11	11	11

NOTES

Source: National Diet and Nutrition Survey (Food Standards Agency & Department of Health, 2010b)

In England and Wales, by the age of 11, children eat less fruit than nearly all their European counterparts (Currie et al., 2008). Only 60% of children aged 4-15 in Wales eat fruit during a typical day, whereas 31% eat sweets and 20% eat crisps (Welsh Assembly Government, 2010b). With respect to physical activity, which is also associated with health, 54% children in Wales exercise for at least an hour on five or more days, including 38% who do so everyday (Welsh Assembly Government, 2010b). In Scotland, physical activity levels have not been found to be associated with either BMI or SES (The Scottish Government, 2010b). However, childhood nutrition does exhibit social inequalities in that poor nutrition is strongly associated with social deprivation (Armstrong, Dorosty, Reilly, Child Health Information Team, & Emmett, 2003; The Scottish Government, 2010b), as is the prevalence of childhood obesity.

In Wales, 34% of children aged 2-15 in Wales are overweight, of which 19% are obese (Welsh Assembly Government, 2010b). The most recent levels of overweight and obesity in this age group in the UK are shown in Table 7 although, as for the adult data, the figures cannot be considered directly comparable.

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Table 7 Prevalence of overweight and obesity amongst children aged 2-15 in the UK

	England ¹	Scotland ²	Wales ³	NI ⁴
All children	29.8%	28.2%	34%	36%
	- 28.3% (age 2-10)	- 23.5% (age 2-6)		
	- 32.3% (age 11-15)	- 29.5% (age 7-11)		
		- 32.6% (age 12-15)		
Boys	28.2%	29.4%	-	-
	- 29.9% (age 2-10)	- 23.0% (age 2-6)		
	- 33.7% (age 11-15)	- 32.6% (age 7-11)		
		- 33.1% (age 12-15)		
Girls	29.8%	27.0%	-	-
	- 26.7% (age 2-10)	- 24.0% (age 2-6)		
	- 30.7% (age 11-15)	- 26.4% (age 7-11)		
		- 32.0% (age 12-15)		

NOTES:

These data are not directly comparable since they were derived from different data sources over different time periods as follows:

¹ Health Survey for England 2009 (The Health and Social Care Information Centre, 2010a)

² Scottish Health Survey 2009 (The Scottish Government, 2010b)

³ Welsh Health Survey 2009 (Welsh Assembly Government, 2010b)

⁴ Northern Ireland Health and Social Wellbeing Survey 2001 (Northern Ireland Statistics and Research Agency, 2002)

By age 11 years, the levels of childhood obesity in the UK are 20% (Wales), 18% (Scotland) and 12% (England), compared to 14% worldwide (Currie, et al., 2008). Only England and Scotland have sufficient data to illustrate trends in child weight. In Scotland, these data are suggestive of no further increases in excess weight (The Scottish Government, 2010b), and, in England, childhood obesity appears to be stabilising (The Health and Social Care Information Centre, 2010a). However, amongst white children aged 5-10 years, disparities are evident in that obesity levels are not stabilising in the lower socio-economic groups (Stamatakis, Wardle, & Cole, 2010).

In children, poor diet can have detrimental effects on physical and social development (Kristjansson et al., 2007), cognitive development, behaviour, concentration and school

performance (Bellisle, 2004; Child Poverty Action Group, 1999). Conversely, improving the food consumed by children has been associated with higher educational attainment (Lozano & Ballesteros, 2006). Furthermore, childhood nutrition is known to influence adult health. The Boyd-Orr cohort consists of 1352 families who were originally surveyed in 1937-9 for a range of measures including dietary intake (Maynard, Gunnell, Emmett, Frankel, & Davey Smith, 2003). Subsequent longitudinal analyses which have examined mortality and morbidity in this cohort have reported inverse associations between childhood fruit consumption and some cancers (Maynard, et al., 2003); vegetable consumption and stroke (Ness et al., 2005). However, the confounding role played by SES, adult intake and adult lifestyle in these studies is unclear. Childhood obesity has been reported as a strong predictor of adult obesity (Clarke & Lauer, 1993; Deshmukh-Taskar et al., 2006; Whitaker, Wright, Pepe, Seidel, & Deitz, 1997). Indeed, obesity represents one of the greatest challenges to child health in the 21st century (Wardle, 2005). In addition, the obesity related disease, type 2 diabetes, previously rare in childhood, is also increasing (Drake, Smith, Betts, Crowne, & Shield, 2002; Pinhaus-Hamiel & Zeitler, 2005) and expected to impose considerable economic and health burdens over the next 20 years (Ehtisham & Barrett, 2004).

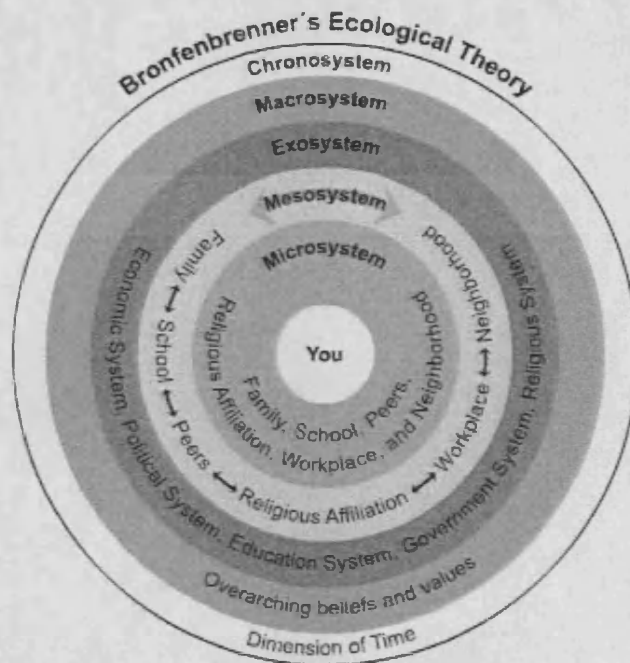
2.2 Explanations of health behaviour

Theoretical explanations of the social and behavioural patterning within epidemiological data exhibit a socio-ecological (SE) suggesting the utility of social ecology as one approach which could be used address public health challenges. There are several theories relating to the development of human behaviour over the lifespan (Dworetzky, 1995). Humanistic theorists argue that human beings are free agents who fulfil their potential through self-initiated learning; whereas psychoanalytical theorists argue that human behaviours are shaped by unconscious desires. Such theories based on unconscious behaviour and free will are arguably incongruous with health improvement approaches predicated on behavioural change. In contrast, behavioural theorists argue that human behaviour is learned and modifiable by experience (Dworetzky, 1995). Alternately, cognitive theorists argue that conscious thought processes are involved in the planning and decision making that underpins behaviour (Dworetzky, 1995). These thought processes develop during childhood such that cognitive maturation spans at least twelve years of the child's life. At a theoretical level, this supports the idea that lifestyle behaviours associated

with health may be modifiable, *provided* the thought processes that invoke them are fully developed. It follows that during childhood there may be limitations in how this can be achieved. Ecological theorists, meanwhile, offer a more holistic theory whereby human development is shaped by wider contexts (McLaren & Hawe, 2005).

Ecological Systems Theory (EST) espouses that human development is shaped by a number of systems or contexts (Bronfenbrenner, 1979, 1986). Conceptually, EST is represented as a series of concentric circles, with the individual at the centre as illustrated by Figure 1. The microsystem represents the immediate settings in which the individual participates (e.g., home, school, workplace) together with face to face inter-relations in these settings. The mesosystem then represents the inter-relations between the settings in which the person participates. The exosystem represents inter-relations between systems in which the person does not participate but which affect the immediate environment (e.g., the education system). The macrosystem represents generalised patterns that define the substance and structure of other systems such as societies or social groups. These patterns are modifiable, which changes the structure of those settings and the behaviour/development of those in them, for example, via public policy. The outermost layer of the model is the chronosystem which represents the passage of time, and recognises the cumulative effect of developmental transitions and the dynamic relationship between context and individual.

Figure 1 Bronfenbrenner's Ecological model of human development

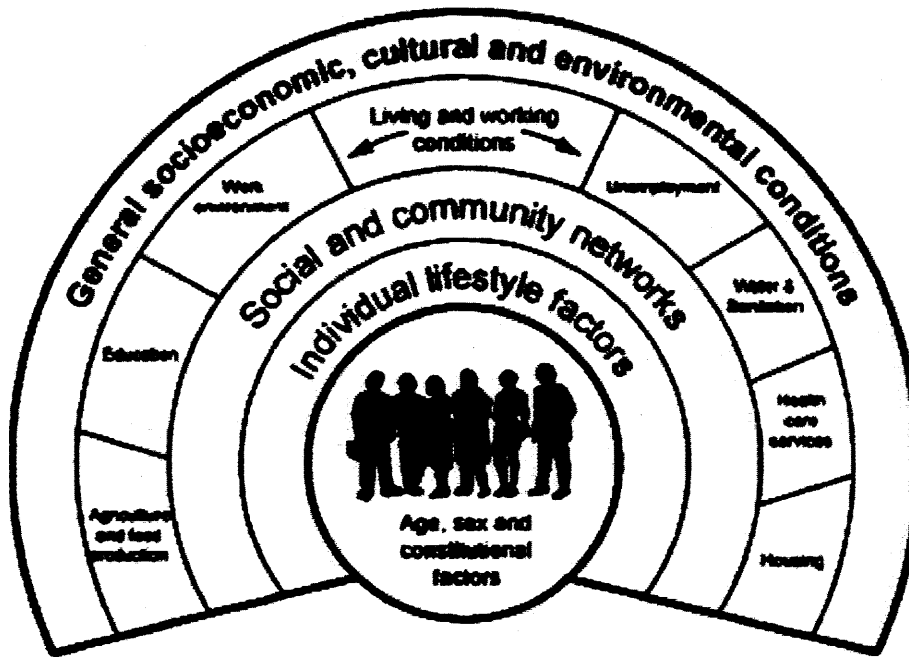


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The social patterning identified within the epidemiological data, meanwhile, suggests the need to identify the wider determinants of health.

Figure 2 is a diagrammatic representation of the determinants of health conceptualised in a rainbow formation (Dahlgren & Whitehead, 2006), henceforth referred to as 'Dahlgren's rainbow'. At the heart of the rainbow are the characteristics of the individual, such as age and sex, which influence their health but are not modifiable. The outer layers of the rainbow represent influences upon the individual that are potentially modifiable – lifestyle; social networks; living and working conditions; and the socio-economic and cultural environment. However, a social gradient exists whereby health and life expectancy is lower in lower socio-economic classes (World Health Organisation, 2003b). It therefore follows that the determinants of health identified in Dahlgren's rainbow do not influence all individuals in equal measure giving rise to social inequities in health.

Figure 2 The main determinants of health



Source: Dahlgren, G, & Whitehead, M. (1991). Policies and strategies to promote social equity in health. Institute of Futures Studies: Stockholm.
 Downloaded from http://www.habitatcorp.com/what_is_hia/what_is_health.html

Comparing EST with Dahlgren’s rainbow reveals a number of similarities. For example, the exosystem of EST represents the changes to social and political processes which are underpinned by the theory encapsulated within Dahlgren’s rainbow. In addition, the social and community network arc of Dahlgren’s rainbow are reflected within the micro- and meso- systems of EST. Similarly, the exosystem is reflected in the living and working conditions arc, and the socio-economic and cultural environment arc of Dahlgren’s rainbow. The chronosystem of EST is reflected within the central portion of the rainbow where age is identified as a non-modifiable characteristic which, nevertheless, changes over the passage of time. This suggests a commonality in the explanations of health and behaviour with respect to the identification of dynamic inter-relationships between individuals and the environment.

The study of the *relationships* between *people*, animals, plants and their *environment* is known as ‘*ecology*’ (Collins, 2010). The ecological perspective is relevant to the sciences (e.g., biology), the social sciences (e.g., sociology, psychology), and their subordinate disciplines (Stokols, 1996). It is predicated on General Systems Theory which considers

phenomena such as the functioning of organisms (including humans) holistically in terms of interactions between elements within a system rather than in isolation (von Bertalanffy, 1968). This notion of a 'system' is central to human ecology which studies human organisation (McLaren & Hawe, 2005), and to EST (Bronfenbrenner, 1979, 1986). Social ecology, meanwhile, emphasises the dynamic social inter-relationships between individuals and the environment (McLaren & Hawe, 2005). Theoretical explanations of the social and behavioural patterning within epidemiological data, therefore, exhibit a socio-ecological (SE) organisation. It arguably follows that adopting a socio-ecological perspective may be one approach towards the formulation of effective public health *solutions*.

2.3 Health improvement policy and its engagement with social ecology

Health improvement policies can be shown to have engaged with SE theory by defining the need to empower individuals to take control of their health by creating supportive environments (such as health promoting schools), and reducing health inequities. This suggests that in order to address challenges which are SE in nature, SE frameworks to support policy implementation may be advantageous. Health improvement approaches have broadened over time having variously addressed disease prevention; structural improvements; health education; and health promotion such that health improvement policies emphasise both individuals as well as the environments in which they conduct their lives. Early approaches to health improvement were based on the medical model which was a mechanistic approach dependant on understanding the structure and function of the body and the diseases that affect it (McKeown, 1979). Its objective was to prevent the occurrence of disease, its progress or its consequences (Nutbeam, 1998b). The approach is primarily the remit of the health sector but, although it remains valid, it is no longer the only approach to health. Structural approaches to health improvement emerged during the 18th, 19th and early 20th centuries, for example, improving nutrition and sanitation (McKeown, 1979). The beginning of the 20th century saw the emergence of health education approaches based on the transmission of knowledge, for example, to promote immunization programmes (Nutbeam, 2000). Health education became more sophisticated in the 1980's with the emergence of theory-based behavioural change interventions (Nutbeam, 2000) such as Social Learning Theory (Bandura, 1986), which aimed to develop individuals' health-related skills as well as their knowledge. Health

promotion, meanwhile, is the process of enabling individuals to take control over their health (Nutbeam, 1998b). It is a complex process orientated at enhancing individuals' capabilities as well as reducing socio-economic disadvantage. As such, health promotion requires supportive actions directed at wider social, environmental and economic conditions which are typically addressed by health improvement policies.

Many health improvement policies have originated from the World Health Organisation. In 1986, the Ottawa Charter for Health Promotion declared that all individuals should be enabled to achieve a state of physical and mental well-being supported by positive social, economic and environmental conditions that reflect differing societal interests. To this end, it defined five priority areas as: the creation of public health policies; the creation of supportive environments; community engagement; the improvement of health services; and the development of individuals' skills (World Health Organisation, 1986). Thus, the Ottawa Charter signified radical changes in the public health movement by declaring that health promotion was not just the responsibility of the health sector. In 1997, the Jakarta declaration re-affirmed the objectives of the original 1986 charter as strategic actions for the 21st century (World Health Organisation, 1997a). In addition, it recommended that health improvement initiatives adopt a multi-component approach which include public participation and empower individuals and communities to take control over their health, capitalising on practical opportunities in real-world settings. Subsequently, the Sundsvall statement emphasised the importance of supportive physical and social health environments including homes, communities and workplaces (World Health Organisation, 1991). To complement this emphasis on environments and individuals, a third dimension for health improvement policy was added in 2003 by an expert consultation on the relationship between nutrition and disease (World Health Organisation, 2003a). This recommended that the human life-course should be conceptualised in terms of a continuous spectrum of opportunities for preventive health measures and the development of cumulative risk. To this end five developmental stages were identified as targets for the prevention of chronic disease – the pre-natal period, infancy, childhood and adolescence, adulthood and old-age.

Health improvement policy has, therefore, engaged with the following SE levels defined within EST and reflected in Dahlgren's rainbow: a) the chronosystem - by recognizing the

need for preventive measures specific to life-stages; b) the exosystem - by recognising the need for social and political process to promote health and social equity in health; c) the meso- and macrosystems by recognising the need to empower communities and individuals to take control over their own health; and, d) the microsystem by seeking to create environments that support health improvement such as homes, workplaces and schools. Indeed, the potential of schools to improve health has received particular attention from policymakers.

2.3.1 Schools as health promotion settings

The concept of the health promoting school (HPS) originated from the Ottawa Charter (World Health Organisation, 1986), thence the 1990 World Conference on Education for All, which identified schools as a potential public health setting (Parsons, Stears, & Thomas, 1996). Settings based health promotion is based upon the recognition that contexts (such as schools) influence health such that any setting can be viewed as: a) facilitating access to large numbers of individuals; b) controllable; c) capable of initiating, or existing within, wider collectives of similar settings that adopt common goals; d) responsive to systemic, cultural change; and, e) the target of policy initiatives (Whitelaw et al., 2001). The HPS is a global concept where issues such as HIV, malaria, smoking, sexual health, and nutrition are tackled according to the individual needs of each nation and school (World Health Organisation, 1997b). Indeed, the potential of the HPS to influence nutritional behaviours in order to prevent mortality from diseases associated with eating unhealthily is regarded as critical (World Health Organisation, 2009). Furthermore, in the UK, developing HPSs, particularly in disadvantaged communities, and improving nutrition in school, has been recommended as a means of addressing inequalities in health (Acheson, 1998).

The organisation of a HPS is specifically oriented to support the improvement of health (World Health Organisation, 1997b). To this end, the HPS continually adjusts its organisation to strengthen its capacity to function as a health promotion setting (Nutbeam, 1998a). It operates at multiple SE levels by aiming to promote the health of the staff, families, communities and pupils associated with it (World Health Organisation, 2009). To achieve these aims, a HPS adopts a holistic approach to health and learning, commonly referred to as the 'whole school approach', which builds the child's knowledge, skills,

behaviours and attitudes through their experiences within the school context as well as the curriculum (Parsons, et al., 1996). The school context encompasses its management, planning, policies, external partnerships and parental involvement. Thus, in a HPS, the formal curriculum is complemented by the 'hidden curriculum' (Parsons, et al., 1996) where the social environment of the school ensures consistency within those aspects of school life, such as nutrition, where learning is put into practice (Denman, 1999). For example, the Wessex Healthy Schools Award was an early scheme based on the whole school approach (Moon et al., 1999). It was launched in 1992 and defined healthy food choices as one of its key areas. A review which began in 1995 and lasted 15 months reported that schools in the scheme had higher healthy food choice scores than those outside. As numerous studies have shown that secondary school children continue to make nutritionally poor choices, even if their nutritional knowledge is sound (Gould, Russell, & Barker, 2006; Klepp, Øygaard, Tell G, & Vellar, 1994; Warwick, McIlveen, & Strugnell, 1997), this would suggest that the whole school approach adopted by a HPS may be more effective than education alone.

Contemporary health improvement approaches, therefore, have evolved to encompass medicine; health education and health promotion, and are heavily entrenched in health improvement policy. Many of these policies, including those associated with the HPS, have origins which date back to the 1986 Ottawa Charter. Their challenges are SE in nature since they recognise the need to empower individuals to take control of their health by creating supportive environments, such as HPSs that are specifically organised to encourage protective behaviours and inhibit behavioural risks. It arguably follows that SE health improvement frameworks could help to address these challenges, thereby facilitating the translation of policy objectives into practice.

2.4 Socio-ecological health improvement frameworks

Evaluating the SE organisation evident within EST and Dahlgren's rainbow against existing SE health improvement frameworks suggests that a model proposed by McLeroy and colleagues (1988) most comprehensively encapsulates the objectives of health improvement policy and the theories that underpin it. Some SE models focus on person-environment relationships in terms of the psychological dispositions of the individual. Specific emphasis is placed on aspects such as the quality of the environment, its ability to

change, or the individuals' perceived control over it. For example, Person-Environment Fit Theory proposes that the wellbeing of the individual is influenced by the degree of congruence between them and their surroundings (Edwards, Caplan, & Van Harrison, 1998). For example, children have been reported as being more motivated to take physical exercise in larger school yards that are less crowded, landscaped, with separate areas for rest and team games (Ozdemir & Yilmaz, 2008). However, this is a limited approach that only addresses one attribute of the individual (their psychological disposition), and is constrained to considering only the immediate environment, exclusive of any social inter-relationships within it.

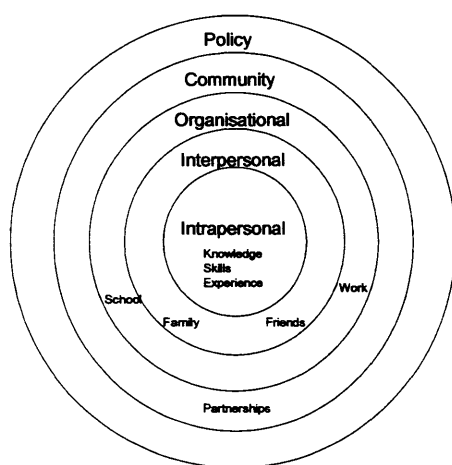
The Biopsychosocial model of health emphasises the interaction of biological, psychological and social factors during the diagnoses and treatment of medical problems (G. E. Schwartz, 1982). For example, the model has been applied to understanding the stress and coping mechanisms experienced by diabetes patients adhering to insulin treatment regimes (Peyrot, McMurry Jr, & Kruger, 1999). In this way, biological factors associated with diabetes previously regarded as uncontrollable were found to be mitigated by psychosocial factors such as self-care behaviours. Thus, the biopsychosocial model adds value to health improvement approaches based on the traditional medical model. When applied to nutritional behaviour, biopsychosocial approaches have been used to consider the physiological processes and signals which are learned by the individual and shaped by society (Oltersdorf, 2003). This acknowledgement that microstructures, such as the family, and macrostructures, such community or society, influence the individual and may affect their health are reflected in the micro- and macro- subsystems of EST, and the cultural and social network arcs of Dahlgren's rainbow. However, in comparison with the multiple levels of influence defined in EST and Dahlgren's rainbow, the Biopsychosocial model cannot be considered holistic, even though it has a broader scope than Person-Environment Fit Theory. Although the model originated as a clinical tool for use within the medical model of health, more recently its potential as a preventive health tool has been suggested, as it represents a multi-level, multi-disciplinary approach to health practice, research and policy making, acknowledging that complex problems require complex solutions (Suls & Rothman, 2004).

When applied to health behaviour, the Structural Ecological Model (SEM) conceptualises factors which influence health behaviour dichotomously in terms of individual factors that are within the control of the individual (such as attitudes, skills, beliefs, knowledge or cognitions), and environmental characteristics external to the control of the individual to which they are passively exposed (Cohen, Scribner, & Farley, 2000). The model proposes four structural factors as potential population level intervention targets: a) product availability (e.g., food); b) the physical environment (e.g., food outlets, eating contexts); c) social structures (e.g., policies or norms); and d) cultural messages (e.g., media advertising). Health improvement approaches informed by SEM could arguably be viewed as attempts to neutralise an environment that is increasingly regarded as 'obesogenic', i.e., as contributing to obesity (Swinburn, Egger, & Raza, 1999). A study of residential care homes in the United States found that adolescents consumed more F/V in homes with a food environment that scored higher on a measure based on the four SEM factors (A. Evans et al., 2009). However, central to the concept of health promotion is the empowerment of individuals to take control over their own health which runs counter to SEM which suggests that individuals are passive and have no control over their environment (Cohen, et al., 2000).

The European Health Promotion Indicator Development (EUHPID) model, meanwhile, views individuals as active in planning, implementing and benefiting from health promotion strategies (Bauer et al., 2003). It places equal emphasis on salutogenesis (health and wellbeing) and pathogenesis (the development of disease) which reflects the WHO's definition of health which emphasises wellbeing as well as the absence of disease (Nutbeam, 1998b). The EUHPID model identifies five sub-systems as potential health promotion leverage or analysis points; a) individuals, or groups of individuals, and their respective skills; b) communities and the potential for community goals and actions; c) health service organisations; d) public health policy; and, e) environmental contexts such as workplaces or schools. Although primarily a framework for monitoring public health, the holistic SE perspective it provides has been recommended for the rehabilitation and support of street-drinkers and cannabis users in deprived inner-city areas (A. J. Ross & Davies, 2009; A. J. Ross, Heim, Flatley, Davies, & Sudbery, 2005).

The notions of individuals being *active* within health promotion strategies, and the need for more holistic SE perspectives is also reflected within the health promotion framework proposed by Mcleroy, Bibeau, Steckler and Glanz (1988)⁴ as portrayed in Figure 3. The model is theoretically informed by Bronfenbrenner's model of human development (1979, 1986) (see Figure 1). Both models can be conceptualised as a series of concentric, nested circles, each of which represents a level of influence on health behaviour or human development respectively.

Figure 3 Mcleroy's Socio-ecological model of Health Promotion



The central circle in Mcleroy et al.'s model represents 'intra-personal' characteristics such as their knowledge, skills or experiences. The outer circles then represent 'inter-personal' features that reflect the individual's relationships within primary groups such as family or friends; 'organisational' factors representing secondary settings such as school, workplaces or other social institutions; 'community' factors such as the influence of geographic communities or local organisations which link individuals with the wider environment; and, 'policy' factors representing the influence of health promotion policies or interventions. The five levels within the framework act as health promotion leverage points and are similar to the determinants of health defined in Dahlgren's rainbow (see Figure 2). In addition, the levels within the McLeroy model suggest levels of analysis to evaluate the success or sustainability of health improvement initiatives, or to aid the understanding of

⁴ Henceforth, the health promotion framework proposed by Mcleroy, Bibeau, Steckler and Glanz (1988) will be referred to as 'the McLeroy model'. This is to aid readability and is not intended to detract from the role played by Bibeau, Steckler and Glanz in the development of the model.

health related challenges. Furthermore, it has informed numerous successful studies of behaviour change, particularly relating to nutrition (e.g., Bowen et al., 2009) and physical activity (e.g., Pronk & Kottke, 2009).

In summary, although SE frameworks such as person-environment fit, the biopsychosocial model, SEM and EUPHID exhibit many SE features, the holistic characteristics espoused by the McLeroy model most closely align with the SE organisation evident within EST, Dahlgren's rainbow, health improvement policy and HPSs. Its use as a formative and evaluative health improvement tool is, therefore, suggested. Evaluating the impact of HPSs on health has previously been reported as problematic due to the complexity of their SE organisation, and difficulties associated with measuring non-behavioural health-related outcomes such as mental and social well-being (Lister-Sharp, Chapman, Stewart-Brown, & Sowden, 1999; Mukoma & Flisher, 2004). An alternative approach may be to evaluate previous disparate school-based interventions against the McLeroy model in order to identify issues and opportunities that could be harnessed to improve health by modifying nutritional behaviour.

2.5 Socio-ecological evaluation of nutritional interventions in schools

When previous school-based nutritional interventions are evaluated from a SE perspective, the potential of the school meal service to improve nutrition and health emerges as a longstanding, and prominent, feature of UK policy. In general, however, policy level interventions have been undermined by processes operating at other SE levels, most particularly the organisational and intra-personal levels. With respect to issues at the latter, for example, children failing to consume healthier food, interventions that have had promising results have tended to operate at the inter-personal level, suggesting that a deeper understanding of the processes involved may be informative.

2.5.1 Policy level interventions in schools

At the policy level, schools are involved in health surveillance, health education and health promotion, although precise definitions of these terms and the boundaries between them are unclear (DeBell & Everett, 1998). Health surveillance originated in the late 19th century with the school health service whose objective was to ensure that no child's education was disadvantaged for health reasons (DeBell & Everett, 1998). School nurses still engage in

health surveillance, for example, via medical examinations conducted at school entry, as well as preventive activities, such as immunisation, although their effectiveness as health promoters has been questioned (Wainwright, Thomas, & Jones, 2000). Although health surveillance may be necessary in a HPS framework, it is not sufficient to improve health, and complementary policy initiatives such as curriculum based health education are recommended (Health Education Board for Scotland, Health Promotion Wales, Health Education Authority, & Health Promotion Agency for Northern Ireland, 1996).

Early approaches to health education in schools included teaching children about the consequences of, for example, smoking, nutrition and physical exercise (Connell, Turner, Mason, & Olsen, 1986). Following a major review of curricular based health education at primary school level in the United States conducted in the 1980s, Connell et al. concluded that between 40-50 hours per annum were required to achieve moderate changes in children's attitudes and practices. Indeed, the formal school curriculum is now viewed as an integral part of the whole school approach upon which the HPS is predicated (Parsons, et al., 1996). In the UK, it is enshrined in policy in the form of the National Curriculum which provides a framework to ensure that teaching and learning is consistent amongst children in compulsory education in state-maintained schools (Training and Development Agency for Schools, 2009). In Wales, the early years curriculum (age 5-7 years) requires that children are taught about healthy eating habits and the difference between healthy and unhealthy foods (Welsh Assembly Government, 2008b). At key stage 2 (age 7-11 years), they are taught that a variety of foods are needed to keep them healthy and how to apply healthy eating messages and nutritional needs to food preparation (Welsh Assembly Government, 2008c). Scotland's 'Curriculum for excellence' also teaches children about healthy choices and varied diets, placing particular emphasis on eating being an enjoyable experience (Learning and Teaching Scotland, 2009). At present, there is no statutory equivalent in England (Qualifications and Curriculum Authority, 2009), although proposals are being considered to make personal, social, health and economic education compulsory at primary and secondary levels which would ensure that English children are formally taught about diet and lifestyle choices. However, in the case of children's nutritional behaviour, education alone is not effective (Gould, et al., 2006; Klepp, et al., 1994; Warwick, et al., 1997). This phenomenon has been referred to as the 'nutritional gap' (Noble, Corney, Eves, Kipps, & Lumbers, 2003). Furthermore, there are dangers

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associated with promoting a food as ‘healthy’ since labelling a novel drink as healthy has been found to reduce positive liking responses in 9-11 year old children (Wardle & Huon, 2000). In addition, giving basic information about foods being ‘good’ or ‘bad’ for you has also been shown to be insufficient to change the food choices of 3-6 year olds (Stark, Collins, Osnes, & Stokes, 1986). In the early 1990s, CATCH (Child and Adolescent Trial for Cardiovascular Health) demonstrated that, over and above the imparting of health knowledge, schools could also encourage healthy behaviour by improving the food service and increasing physical activity levels during physical education lessons (Resnicow, 1996). Such principles are central to a formalised movement which has seen the emergence of networks of HPSs (Health Education Board for Scotland, et al., 1996).

Figure 4 Socio-ecological dimensions of the criteria required for inclusion within the HPS network

HPS criterion	SE Dimension ¹
1 To promote pupils’ self esteem by demonstrating that anyone can make a contribution to school life	Intra-personal
2 To develop good staff/pupil relations	Inter-personal
3 To clarify the social aims of the school	Organisational
4 To provide stimulating challenges for pupils	Intra-personal
5 To improve the physical environment of the school	Organisational
6 To develop good links between school, home and community	Community
7 To plan a coherent health education curriculum	Policy
8 To actively promote health	All
9 To consider the role of staff as exemplars	Inter-personal
10 ² To consider the complementary role of school meals	Policy
11 To realise community based support services	Community
12 To develop the school health service beyond surveillance	Organisational

Source: (Health Education Board for Scotland, et al., 1996)

NOTES:

¹ These dimensions relate to the levels within the McLeroy model depicted in Figure 3

² In Wales, criterion 10 covers all health related activities, not just school meals, to allow schools to focus on activities of their own choosing (Bowker & Tudor-Smith, 1996)

The emergence of synergies through the formation of networks of similar settings that share common goals is a recognised advantage of the settings approach upon which the HPS is predicated (Whitelaw, et al., 2001). The European Network of Health Promoting

Schools (ENHPS)⁵ was launched in 1992 (Health Education Board for Scotland, et al., 1996). The UK entered the network in 1993 with separate but complementary initiatives in England, Scotland, Wales and Northern Ireland. HPS networks can now be found worldwide in countries such as China (Xin-Wei et al., 2008) and Hong Kong (Lee, Cheng, Fung, & St Leger, 2006). Schools within the HPS network are required to adhere to a range of criteria whose common objective is to improve health (Health Education Board for Scotland, et al., 1996). As Figure 4 shows, in their totality, these criteria operate across all SE levels suggesting that HPS *philosophy* is socio-ecologically holistic. However, questions remain as to whether HPS *implementations* are as holistic as the philosophy upon which they are predicated. Several reviews have reported that HPS interventions have failed to embrace all SE levels (Dooris, 2005; Mukoma & Flisher, 2004), an assertion that has been levied at HPS networks as well as health promotion undertaken in schools not affiliated to HPS networks (Lister-Sharp, et al., 1999). For example, there has been a heavy reliance on interventions based exclusively on the formal curriculum (Lister-Sharp, et al., 1999), an approach which has repeatedly been found to be ineffective in the nutritional domain (Peters, Kok, Ten Dam, Buijs, & Paulussen, 2009). More successful interventions have incorporated multiple components with wider SE coverage, typically encompassing the school, the community and the home (Lister-Sharp, et al., 1999) with teachers playing a prominent role in delivery (Mukoma & Flisher, 2004). One SE level that has been under-emphasised in previous interventions is the policy level (Mukoma & Flisher, 2004). However, consideration of the complementary role of school meals is an essential criterion for HPS membership (see Figure 4) and the school meal service has featured heavily in policy since its inception. In 2002, the Egmond Agenda defined a set of core principles for the HPS which included the need to embed analytical processes within the policy cycle (World Health Organisation Europe, 2002). This suggests that analysing school meal policy is essential to ensure its sustainability and success within the HPS model.

2.5.1.1 The school meal service

The original objective of the school meals service, as defined by the 1906 and 1944 Education Acts, was to combat malnutrition (Davies, 2005). Indeed, school meals

⁵ The ENHPS was subsequently renamed as Schools for Health in Europe (SHE)

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potentially make available between 25%-33% of the daily nutrient intake (Gregory, 2000) of a child during a school day (i.e. during weekdays within term time). However, beginning in the 1970s, tensions originating at multiple SE levels undermined the objectives of the school meal service, culminating in the recognition that policy level intervention was required to transform the service.

During the 1970s, increased wealth and the rise of consumerism led to a change in children's tastes such that 'nutritious' school lunches were rejected in favour of more attractive options (U. Gustafsson, 2002). This trend was fuelled by the 1980 Education Act which removed the obligation to provide school meals, and later by the 1988 Local Government Act which introduced competitive tendering. These new objectives to minimise expenditure and maximise choice resulted in the school meal service contributing to the problems of healthy eating (K. Morgan, 2006). Malnutrition became more commonly associated with over-nutrition than under-nutrition, and plate waste in schools was high (Rose & Falconer, 1992). This decline in the school meal service conflicted with the increasing emphasis on schools as a health promotion setting and whole school approaches to healthy eating where standard of catering in the schools was identified as a barrier (Moon, et al., 1999). In addition, the way food was provided in schools at lunchtimes was problematic (Bowker, Crosswaite, Hickman, McGuffin, & Tudor-Smith, 1999). For example, in secondary schools, many alternate food sources were available such as tuck shops, vending machines, self-service cafeterias, packed lunches and external food sources so that the availability of foods was not conducive to the making of healthy choices. Long queues in school canteens, exacerbated by limited lunch breaks also dissuaded children from using the school meal service. Issues such as the need to avoid waste meant that school caterers were unable to provide much choice, particularly in primary schools (Bowker, et al., 1999).

The impetus in transforming school meal provision commenced at the start of the 21st century when improving child health through nutrition in schools became a principle objective of health promotion programmes in the UK (Department of Health, 2004; Food Standards Agency Wales, 2003; Scottish Office Department of Health, 1999). Scotland led the way in transforming school meal provision with its 'Hungry for Success' initiative (Scottish Executive, 2002). Its key principle was a 'whole child, whole school approach'

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which aimed to achieve consistency between what was taught and what was served in all feeding contexts (i.e. lunchtime, breakfast, tuck shops and vending machines), ensuring that the child's whole school experience was positive. As well as proposing the re-introduction of nutrient standards for school meals, it defined agents for change at multiple SE levels recommending that Local Education Authorities (LEAs) work with caterers, schools, teachers, parents and pupils. The 'Hungry for Success' report acknowledged the importance of encouraging children into the dining room (i.e. into the school meal system), noting the significant contribution of peer pressure and parental attitudes to this decision. Once in the dining room, the report further emphasised the importance of promoting healthy choices and encouraging consumption – activities that were welcomed by the children. In some schools, school meal supervisors and catering staff carried out this role. However, school meal supervision was commonly undertaken by teachers as opposed to teaching assistants or dedicated supervisory staff. It was therefore recommended that major investment be made to ensure that teaching staff were not used for non-teaching objectives.

In England, the 'Choosing Health: making Healthy Choices Easier' report announced a support package known as 'Food in Schools' which was launched in early 2005 to support the implementation of a whole school approach to healthy eating (Department of Health, 2004). In addition, the School Meals Review panel was set up which launched England's 'Turning the Tables' programme (School Meals Review Panel, 2005). Once again, the revision of nutritional standards was considered paramount together with the recommendation that OFSTED school inspections monitor the standards. One objective of these standards was 'choice control' whereby food availability was manipulated to promote healthy options but restrict unhealthy ones. This was seen as a means of introducing and reinforcing habits that would promote child health. A whole school approach that embraced multiple SE levels was recommended involving caterers, LEAs, governors, headteachers, parents and children i.e. those who procure, supply, consume and educate. However, training for caterers was limited to cooking skills.

In 2006, Wales launched its 'Appetite for Life' (A4L) initiative which was driven by a consultation document accompanied by questionnaires aimed at children, young people and interested adults (Welsh Assembly Government, 2006a). A formal action plan was launched in 2007 (Welsh Assembly Government, 2008a). Once again, raising nutritional

standards was a key objective, as was a whole school approach with respect to the consideration of fitness alongside nutrition, and engagement with a wide range of stakeholders. Although A4L focussed on provision, it recognised that children would need encouragement to consume the healthy foods on offer. To this end, a two year action research project was commissioned in 2008 involving four LEAs. Results from this project are intended to inform the wider implementation of A4L throughout Wales (Welsh Assembly Government, 2010a). Meanwhile, smaller grants were made available to other LEAs to progress localised A4L initiatives.

The transformation of the school meal service, therefore, is heavily enshrined in national policy and socio-ecologically complex (C. E. L. Evans & Harper, 2009) and the question arguably remains as to the likely effectiveness of these latest iterations of school meal policy compared with their predecessors. In the UK, no formalised processes are in place to evaluate the school meal service and associated policies. In the United States, however, the US Department of Agriculture, who are responsible for the National School Lunch Program, sponsor regular School Nutrition Dietary Assessment (SNDA) studies (Gordon, Crepinsek, Briefel, Clark, & Fox, 2009). The SNDA studies generate quantitative information pertaining to, for example, the nutrient content of meals and their contribution to diets, and qualitative information regarding, for example, the availability of other food sources (Gordon, et al., 2009). The most recent study found that policy recommendations were not always implemented and recommended further qualitative research to identify the barriers. It also noted that the ideal situation would be for Randomised Controlled Trials (RCTs) to collect baseline and follow-up data of (e.g.) BMI for all policy implementations, even if these were smaller, localised trials due to the costs involved in national trials. The contrasts with the approach adopted by the UK where the emphasis is on compliance rather than effectiveness, relying on school inspectorates to provide information (Estyn, 2008; Her Majesty's Inspectorate of Education, 2005; OFSTED, 2006), together with trials of specific sub-ordinate projects such as free school meals for all (The Scottish Government, 2008), or, in the case of Northern Ireland, a 'wait and watch other countries' approach (C. E. L. Evans & Harper, 2009). Retrospective evaluation of the school food transformation initiatives would be problematic as inherent difficulties such as response bias and contamination exist once the implementation timetable has been set (L. Moore et al., 2007). However, research conducted in Yorkshire has shown that even if nutritionally

balanced meals are available, primary schoolchildren often fail to consume them, regardless of whether the school mandates the serving of foods from the major categories of the menu (e.g., main course, potato, vegetable, dessert) (Gatenby, 2007). This study found that the food consumed represented the food the children liked, resulting in intakes of fat, salt and sugar that exceeded the guidelines. This suggests that factors operating at the intra-personal level, such as food preferences, act as policy barriers, illustrating the existence of (negative) reciprocal relationships between these SE levels.

It is clear from the literature, therefore, that health surveillance and health education alone are insufficient, and that more holistic health improvement initiatives are required. Whole school approaches emphasise the importance of the role of food provided in school which is reflected in the current emphasis on school meal transformation within national policy. However, this transformation process is itself socio-ecologically complex, for example, at the intra-personal level, the potential of children's existing food preferences to compromise policy effectiveness remains problematic. To mitigate issues inherent in this reciprocal relationship between policy and intra-personal levels, pupil consultation is regarded as an essential part of policy design and implementation.

2.5.2 Reciprocity between policy and intra-personal levels

School Nutrition Action Groups (SNAGs) are a common mechanism used to establish positive reciprocal relationships between policy and intra-personal levels. As child engagement requires careful consideration of the methodologies used, particularly with respect to the cognitive demands placed on the child and the influence of adult/child power relations, it is questionable whether SNAGs are an appropriate engagement mechanism where younger children are concerned. The right of children to have their views considered on matters that affect them, as well as their rights regarding health protection through the provision of nutritional food was established by the UN Convention on the Rights of the Child (United Nations, 1989). Educational policy in England also stipulates that children should be included in decisions that impinge upon their learning (HM Government, 2004). This suggests that children 'should' be engaged in discussions related to the school meal service on the basis that it contributes to their experiential learning within the whole school approach. However, the establishment of children's right to contribute to decisions traditionally made by adults does not eradicate issues of power relations within the

decision making process. For example, Hart (1992) defines the Ladder of Participation which conceptualises the degree of children's participation on a spectrum ranging from passive and tokenistic, to active and fully inclusive. Furthermore, having established that children 'should' be heard, an equally important consideration is whether their cognitive and psychosocial developmental stage suggests that they 'could' participate in consultations (R. Hart, 1992). Issues such as self-esteem and the ability to take the perspective of another are as critical as the child's knowledge base. Numerous studies have reported that children are familiar with the concepts of healthy eating (Dixey, Sahota, Atwal, & Turner, 2001; J. S. A. Edwards & Hartwell, 2002; S. Ross, 1995; Warren, Parry, Lynch, & Murphy, 2008). On the other hand, many have reported that children's choices do not reflect their nutritional knowledge (K. Brown, McIlveen, & Strugnell, 2000; Hamilton-Ekeke & Thomas, 2007; Noble, et al., 2003). Children are adept at learning what they are supposed to do, but doing what they like to do (Forbat & Henderson, 2005). Indeed, children have been shown to use liking/disliking as a food classification system as opposed to other attributes such as healthiness (K. H. Hart, Bishop, & Truby, 2002; S. Ross, 1995). To avoid pupil engagement being tokenistic or overly reliant on cognitive processes that may be under-developed, careful consideration needs to be given to the engagement methodology used.

In the field of education, 'circle time' is an established method of engagement that involves the children and the teacher sitting in circle formation to facilitate the exchange of views (Lown, 2002). It is a form of socially mediated learning that has the potential to enhance the child's emotional development (e.g, by building self-esteem) as well as their intellectual development. Although widely used and written about, the approach has not been rigorously evaluated. A study by Hopkins (2008), meanwhile, provides a useful insight into some approaches shared by education and research. The findings showed that children aged 7-11 valued opportunities to actively engage in learning rather than passively absorb information. The method involved group discussions of three questions which were written on flipcharts with the main themes elicited from the children drawn on a 'fishbone' diagram⁶. Other research approaches used to elicit children's views during group

⁶ Fishbone diagrams (aka Ishikawa or cause-and-effect diagrams) are widely used in industry/commerce as a means of collecting/representing data on a structure similar to the skeleton of a fish (The Quality Library, 2009).

discussions include using semi-structured interviews (Fiates, Amboni, & Teixeira, 2008) or questions displayed on flip charts. The common factor amongst these research methods is that discussions are initiated using language devised by adults. Such adult-centred approaches carry a risk that children's conceptualisations of the subject matter are overlooked (Lawler & Prother, 2008). By way of contrast, less structured, more child-centric approaches to elicit children's points of view have been recommended in the field of consumer marketing, which deals with generalised product promotion as opposed to healthy school meal promotion (Banister & Booth, 2005). For example, to understand how 7-12 year old children interpret advertising, a small number of broad topics were offered for discussion in focus groups to avoid introducing adult conceptualisations of the subject matter (Lawler & Prother, 2008), albeit, still relying on adult generated language to initiate discussions. Altering the emphasis from verbal to visual prompts, circle time has been used as a research methodology with photographs of eating contexts used to stimulate discussion on food choices (Warren, Parry, Lynch, & Murphy, 2008).

Pupil consultation has been an important feature within school meal transformation programmes in the UK (School Meals Review Panel, 2005; Scottish Executive, 2002; Welsh Assembly Government, 2007a). Scotland and Wales consulted pupils during the formulation of their school meal transformation programmes (Scottish Executive, 2002; Welsh Assembly Government, 2006a). These consultations were formal and structured and solicited pupils' views on questions devised by adults. Pupil consultation is also an inherent feature of the ongoing programmes in England, Scotland and Wales, typically utilising bodies incorporating pupil representatives such as School Nutrition Action Groups (SNAGs) (School Meals Review Panel, 2005; Scottish Executive, 2002; Welsh Assembly Government, 2008a). At secondary school level, SNAGs have been successful in increasing consumption of school meals (Passmore & Harris, 2005). However, SNAGS exhibit structural characteristics such as power relations as they primarily consist of adults. They also rely on cognitive elements such as perceived behavioural control and intentions to change which may compromise their success at primary school level (11 years and under) (Passmore & Harris, 2005). The same period has seen the growth and development of school councils which are pupil-led bodies that involve all pupils in school matters (School Councils UK, 2009). School councils have been a statutory requirement in Wales since 2005 but are not mandatory in England although 90% of schools have a school

council (Witty & Wisby, 2007). School councils have a broader remit than SNAGS, typically considering all areas of school improvement that impinge upon learning and pupils' emotional well-being. The success of school councils requires a delicate balance of adult influence to guide, but not dominate discussions.

It is clear from the literature, therefore, that mechanisms are in place to facilitate reciprocal relationships between school meal policymakers and pupils. However, the methodologies used to date have not been theoretically informed. Power relations and a reliance on cognitive abilities that may be under-developed in children suggest that SNAGS may not be the most effective means of engaging primary school pupils in discussions regarding school nutrition. Whereas school councils may be less subject to power relations, further research is needed to assess their effectiveness as an engagement mechanism for topics associated with health improvement or behavioural change. Further SE influences on nutritional interventions in school are evident at the organisational level.

2.5.3 Organisational influences on school nutritional policies

The use of schools, and the school meal service in particular, to realise health improvements through improved nutrition is heavily entrenched in policy. At the organisational level, SE processes operating within and between organisations influence the effectiveness of such policies suggesting that an understanding of both is required to inform intervention design.

2.5.3.1 Inter-organisational influences on school meal delivery

The multi-layered organisational structure required to support school meal delivery is associated with numerous SE processes that operate between the organisations involved. The school meal service in the UK is currently the subject of national transformation policies. However, the provision of school meals within the UK falls within the remit of LEAs where school meals are subject to compulsory, competitive tendering (K. Morgan, 2006). In Wales, 97% of primary schools are catered for by an LEA in-house provider, and in Scotland the figure is 95% (Davies, 2005). However, in England, the figure is lower (68%) since outsourced providers (17%) or schools themselves (10%) may provide the catering (Department for Education and Skills, 2008). This multi-layering of organisational involvement is a common feature of programmes that originate at national level (Coffield

et al., 2007) and illustrates the complex web of inter-relationships required between hierarchical layers of government and local government, and also between commercial providers. In addition, the original programme is potentially subjected to additional priorities at each decision making level (Coffield, et al., 2007). For example, competitive tendering is associated with a reduced focus on diet and health and an increased focus on cost control and income generation (Davies, 2005). In the case of the school meal service, income generation is dependant upon school meal uptake (the number of children taking school meals) and school food provision incurs cost.

School food provision is a critical component of the school meal service and epitomises holistic approaches to nutrition in schools where community involvement extends to farmers/producers providing schools with fresh local food (K. Morgan, 2006). Indeed, Wales has led the way in openly discussing issues surrounding public food procurement (Soil Association, 2003a). However, provision and procurement have implications for diet/health over and above cost as the following example illustrates. In 2002, 91% of primary schools in Wales offered set meals with single main dishes, heavily reliant on processed products (Soil Association, 2003a). This was set against a backdrop of Wales's capability for high quality food production and a trend for farmers going out of business. Nevertheless, at the time, Carmarthenshire's school meal service was enjoying 67% uptake levels, 100% in some schools (Soil Association, 2003b). This was attributed to onsite preparation by skilled staff using fresh ingredients; centrally based procurement based on partnerships with suppliers; a performance based service; and, alignment with the council's corporate strategy towards health. However, it was characterised as a high quality, high cost operation by the Audit Commission in 2001 whose solution was to cut back on fresh food provision to save costs. As a result, the Soil Association's Food for Life report noted that the performance indicators used were not aligned to nutrition and long term health goals (Soil Association, 2003b).

School meal uptake has implications for health improvement as well as income generation. In England, school meal uptake is used as an indicator of children's well-being, together with the success of a school in promoting healthy eating, and, as such, forms a part of school inspections (School Food Trust, 2009d). Similarly, in Wales, schools that provide school meals have a statutory obligation to encourage uptake in order to promote child

health (National Assembly for Wales, 2009), although, at present, the remit of school inspectors is confined to the making of broad observations regarding school meal provision (Estyn, 2008). On the other hand, school meal uptake is associated with commercial considerations which can be at odds with concerns for health as the commercial viability of school meal provision depends, in part, upon the extent to which food availability matches pupil demands (K. Brown, et al., 2000; Gray, 2008). Therefore, unpopular, but possibly healthier, foods may be removed from sale (Davies, 2005). In England, 52.1% of local authority caterers reported an operating deficit at primary school level (Nicholas et al., 2008).

The first survey of school meal uptake up in England was conducted in 2006 which showed that in 2005-6, primary school uptake was 42.3%, which represented a reduction of 5.8% from the previous financial year when uptake was 44.9% (Nelson & Nicholas, 2006). In 2009-10, primary school uptake was 41.4% (Nelson et al., 2010) having increased from 39.3% in 2008-9 when the derivation of uptake was revised (Nelson, Nicholas, Wood, Lever, & Porter, 2009). Nevertheless, this figure is substantially less than targets set in 2005-6 to achieve an increase in uptake of ten percentage points (Nelson, et al., 2010). The popularity of packed lunches is cited as the principle barrier to increasing uptake. Similar data for Wales are not published but, in Scotland, primary school meal uptake rose to 50.4% during 2009 which is the highest recorded figure since 2001, showing signs of recovery from the three percentage point dip experienced in 2005 (The Scottish Government, 2010a), three years after the launch of the 'Hungry for Success' programme (Scottish Executive, 2002). As the percentage of pupils taking free schools meal in Scotland since 2006 has remained relatively stable (The Scottish Government, 2010a), it is feasible that this upturn is related to 'Hungry for Success' initiatives. However, there is insufficient data at present to indicate whether 2009 represents a trend or an idiosyncrasy. In 2008, Scotland undertook a trial of a free school meal for all policy in three local authorities which increased uptake in primary schools from 50% to 60% (The Scottish Government, 2009a). Similar initiatives have been, and are being, commissioned by various LEAs in England (Bailey, 2009). The emerging consensus is that school meal uptake reaches a ceiling at about 75%, the remaining 25% of pupils being regarded as fussy eaters. Secondary outcomes include increased concentration in class and reduced stigma associated with receiving free school meals, but increased cost, and pressure on time and

dining hall capacity are problematic. The latter illustrates how characteristics operating *within* an organisation influence nutritional interventions.

2.5.3.2 Intra-organisational influences on nutrition in schools

The characteristics of the organisation or setting that hosts an intervention are equally as important as its relationships with other organisations. The literature suggests that within-school influences on nutrition in schools include school effects and the school meal context. School effects such as school policy, ethos, SES and geographic location have been shown to be associated with health behaviours. For example, a review of the literature into the determinants of children's F/V consumption found an association between the existence of school food policies and food availability (Rasmussen et al., 2006). A later study reported counter-intuitive findings that daily F/V consumption (amongst 11 year olds) was not higher in schools where F/V were available (Krølner et al., 2009). This was attributed to methodological issues with respect to low statistical power or the use of verbal reports to assess food availability. Alternately, it was postulated that the children's food preferences may have rendered availability inconsequential, i.e., if children don't like F/V, they won't eat it even if it is available. Indeed, a qualitative study into the food choices of school children in Wales also showed food availability to be critical for the uptake of school meals as well as the choices made at the point of service (Paisley et al., 2006). Further school effects associated with nutrition emerged from a secondary analysis of the 1998 Canadian Health Behaviours in School Aged Children data which found an association between nutritional behaviour and parental support and positive peer influences (Ma, 2007). A more general review of school effects on a range of pupil outcomes, meanwhile, failed to find any studies that had examined between-school variation in nutritional outcomes (Sellström & Bremberg, 2006). Outcomes that had been studied were smoking, alcohol use, behaviour/wellbeing, attainment and physical activity, with school-effects attributed to school policies, school climate, higher SES and urban locations. These disparate findings reinforce previous recommendations regarding the importance of assessing the background conditions required for an intervention to be successful (Nutbeam, 1998a).

Process evaluations assess issues such as programme reach, acceptability to stakeholders or gatekeepers, and integrity (i.e., was the intervention implemented as planned). However, process evaluations were either not included within the evaluations of previous nutritional

interventions, or constrained to quantitative assessments of the faithfulness of the intervention, for example, the amount of F/V available to pupils assessed via observation (e.g., Perry et al., 2004). This lack of comprehensive process evaluation data means that there is no contextual evidence to inform how future interventions could be both sustainable and transferrable to other schools (Parry-Langdon, Bloor, Audrey, & Holliday, 2003). One systematic review of school-based dietary interventions concluded that previous interventions have generally been costly, time consuming, labour intensive and reliant on support from research staff (French & Wechsler, 2004). Indeed, Nutbeam notes that a successful intervention has to be implemented in circumstances that are close to real life, otherwise, they are a waste of resource (1998a). Consequently, a detailed understanding of the context in which target behaviours are embedded is as important as understanding the behaviours themselves. A limitation of nutritional interventions to date is that a theoretical framework has not been used to inform the *contextual* aspects of their design.

It is clear from the literature, therefore, that nutritional interventions are influenced by processes at the organisational level with respect to the organisational structures required for implementation and the inherent characteristics of organisations (e.g., school contexts). Further SE processes are also evident at the intra-personal level of analysis.

2.5.4 Intra-personal characteristics of nutritional interventions

At the intra-personal level, the design of previous nutritional interventions has involved the selection of outcome measures that have not been theoretically informed, and incorporated Social Cognitive Theory, whose robustness as a framework for explaining dietary behaviour in young children has been questioned. Generally, such interventions have had disappointing results, suggesting that a deeper understanding of processes associated with the intra-personal level is required.

Numerous nutritional interventions have targeted specific intra-personal attributes as their outcome measures. The most common outcomes sought have been to increase consumption of, or preferences for, F/V (Anderson et al., 2005; Baranowski et al., 2003; Bere, Veierød, Bjelland, & Klepp, 2006; Day, Strange, McKay, & Naylor, 2008; Hendy, Williams, & Camise, 2005; Horne et al., 2004; Perry et al., 1998; Perry, et al., 2004; Reynolds et al., 2000). Less common outcomes have included lowering consumption of

dietary fat (e.g., Whitaker, Wright, Finch, & Psaty, 1993) and, occasionally, multiple outcomes have been targeted. For example, the Planet Health intervention sought to increase F/V intake, lower fat intake, increase physical activity and reduce television viewing (Gortmaker et al., 1999). Evaluation of such interventions has typically involved large scale Randomised Controlled Trials (RCTs), (e.g., Baranowski et al., 2000; Lytle et al., 2006; Perry, et al., 1998; Reynolds, et al., 2000), or experimental studies without control groups (e.g., Hendy, et al., 2005). They generally included baseline and post-study measurements (e.g., Anderson, et al., 2005; Baranowski, et al., 2003) and occasionally follow-up assessments (e.g., Lytle, et al., 2006; Perry, et al., 1998). In some cases, if the initial evaluation produced disappointing results, the intervention was modified and evaluated again. For example, the 5-a day Power Plus intervention (Perry, et al., 1998) was re-designed and re-evaluated as the Cafeteria Power Plus intervention (Perry, et al., 2004) and Gimme 5 went through two iterations (Baranowski, et al., 2000). In general, however, the interventions produced either no increase in F/V consumption (Bere, et al., 2006) or moderate increases (e.g., Anderson, et al., 2005; Baranowski, et al., 2003; Day, et al., 2008; Reynolds, et al., 2000) which were often not sustained (e.g., Reynolds, et al., 2000). From a health improvement perspective, it is clear from epidemiological data that F/V consumption can protect against chronic diseases such as cancer or heart disease, therefore, the limited success of previous interventions is concerning. However, SE theories of human development suggest that behaviour is subject to multiple influences that are both complex and dynamic (Bronfenbrenner, 1979, 1986). This arguably implies that selection of outcomes to be targeted by nutritional interventions should be based on a detailed understanding of all their attributes that includes, but is not limited to, epidemiological data.

Although the literature has not emphasised the use of theoretical frameworks to inform the *contextual* design of previous school-based nutritional interventions, the same cannot be said for the design of behaviour modification techniques themselves. Many previous school based nutritional interventions have been based upon Social Cognitive Theory (SCT), (e.g., Bere, et al., 2006; Perry, et al., 2004; Reynolds, et al., 2000). SCT primarily operates at the intra- and inter-personal levels and espouses that human functioning can be explained in terms of a triad of three elements which constantly interact - behaviour, personal/cognitive factors and the environment (Bandura, 1986). An SCT intervention is generally constructed

with components that act on all elements of this triad, for example, the cognitive element of the 'Gimme 5' intervention included advice on how to cope with failure to attain eating goals (see Baranowski, et al., 2000). In some cases, the behavioural components of such interventions were based on previous research into dietary change, for example, the 'Kid's Choice' intervention used evidence that offering children a choice of foods increased intake (see Hendy, et al., 2005). Some interventions were developed by using prior research to identify factors known to mediate their chosen outcome variable, and devising ways to address these factors. For example, the TEENS intervention examined factors associated with adolescents' food intake, such as availability, and addressed those (Lytle et al., 2004). Another approach was to use focus groups to understand what influenced the chosen outcome variable as in 'Gimme 5' which identified that F/V were disliked, not available at home, and that preparation skills were low (Baranowski, et al., 2003). This reliance on SCT occurred despite the fact that its robustness as a framework for explaining dietary behaviour in young children has been questioned due to the complexity of this behaviour (Resnicow et al., 1997). For example, the health benefits of F/V consumption are both delayed and intangible requiring the ability to formulate abstract gain-loss associations (Umeh & Crabtree, 2006). The cognitive maturation required to formulate such abstract concepts is under-developed until approximately twelve years of age (Piaget & Inhelder, 1969). Consequently, the identification of age-appropriate theoretical bases for interventions is important.

Whilst evaluating previous nutritional interventions at the intra-personal level, therefore, issues have emerged regarding the selection of nutritional behaviours to modify, thence how to effect the modification. A more detailed examination of the SE processes associated with the intra-personal level, therefore, may suggest possible solutions to these issues.

2.5.5 Socio-ecological processes impinging on the intra-personal level

Encouraging results have been obtained from interventions that have emphasised interactions between the intra- personal and other SE levels suggesting the importance of fully understanding the processes involved in order to identify potential solutions to previously identified issues. A common feature of previous nutritional interventions has been the utilisation of multi-component designs (French & Wechsler, 2004) that have

exploited relationships between the intra-personal level and other SE levels. Typical components have involved the formal curriculum, parental activity and the food service (e.g., Perry, et al., 1998; Reynolds, et al., 2000). Although multi-component approaches to school based nutritional interventions have been recommended (e.g., Bere, et al., 2006; Blanchette & Brug, 2005), one issue is that if they are effective, it is not known which component(s) are effective, and how many of them are necessary and sufficient for a positive outcome (Burchett, 2003). Conversely, the outcome of a single component intervention may be less powerful than when the same techniques are complemented by other components (Perry, et al., 2004). This was the finding when the cafeteria component of the 5-a day Power Plus intervention (see Perry, et al., 1998) was isolated from the curriculum, home and supplier components and re-evaluated (Perry, et al., 2004). Indeed, Grzywacz and Fuqua note that the strength of SE theory in acknowledging contextual complexity is also its limitation since an 'everything affects everything' approach is unhelpful for intervention design (2000). It is important, therefore, to understand the relative importance of the processes operating within and between all SE levels in order to design health improvement interventions on components most likely to achieve optimum effects.

A number of school-based nutritional interventions have been based around processes operating between the inter- and intra-personal levels. These have emphasised the social environment and focussed on motivational components in the form of peer or fictional role models or rewards for increased intake, and outcomes have been promising in some (Horne, et al., 2004; Lowe, Horne, Tapper, Bowdery, & Egerton, 2004; Perry, et al., 2004) but not all studies (Hendy, et al., 2005; Lytle, et al., 2006). One intervention, based on one component of the multi-level Cafeteria Power Plus intervention (Perry, et al., 2004), dealt specifically with school meal staff (M. B. Schwartz, 2007). A pilot study within two elementary schools in the USA found a verbal prompt, 'would you like fruit or juice', delivered by service staff increased uptake and consumption of fruit by approximately 50%. This study suggests that in schools, *how* children are fed is as important as *what* they are fed. As children's early experiences with food are critical, it has previously been recommended that parents should receive guidance regarding their feeding practices (L. J. Cooke et al., 2004). However, between 25%-33% of a child's daily nutrient intake is school based (Gregory, 2000) as opposed to home-based suggesting that during term-time,

one-third of the opportunities to influence the child's eating behaviour occur at school. Nevertheless, the social interaction between school meal staff and children has generally been overlooked by both research and policy to date suggesting an important direction for future research into school nutrition.

2.5.6 Future directions for health improvement and school nutrition

In summary, evaluating previous school-based policies and interventions to improve pupils' diet (and nutrition) from a SE perspective reveals both issues and opportunities associated with processes operating within and between SE levels, such that a deeper understanding of these processes may inform potential health improvement opportunities. It is clear from the literature that interactions involving the policy, community, organisational and intra-personal levels may be inhibiting policy based health improvement objectives. In particular, policy interventions have emphasised the importance of the HPS and the school meal service, yet the school meal service has consistently been undermined by processes operating at lower SE levels. For example, nutritional education has failed to change nutritional behaviour, and children's food preferences have conflicted with the food offered. To mitigate the latter, contemporary school meal transformation programmes incorporate an element of pupil consultation most typically in the form of SNAGS, but it is questionable whether these are appropriate for use with younger children. In addition, these programmes are subject to multi-level influences at the point of delivery, such as school meal provision costs and income generated. Meanwhile, school-based interventions that have directly targeted the modification of eating behaviour have failed to consider potential contextual influences, such as the resources required. Furthermore, the design elements of many of these interventions with respect to the behaviours targeted; the behavioural change mechanisms used; and, the component mix have lacked a sound theoretical understanding. This suggests a number of directions for future research.

At the organisational level, further research is suggested to better understand the school meal context with respect to its inherent characteristics and the multi-level influences associated with policy delivery. At the intra-personal level, further research is suggested to better understand the implications for pupil engagement during policy implementation. In addition, evaluations of nutritional interventions in schools have recommended the use of multi-component designs, as holistic SE approaches would suggest. However, component

mixes have generally not been based upon an understanding of the relative importance of the inherent processes within and between SE levels, thereby failing to ensure that health improvement initiatives are comprised of components necessary and sufficient to achieve optimum and sustained effects. It is important that the design of each component is theoretically informed to ensure that it adds value to the end product. In addition, the selection of outcomes to be targeted by nutritional interventions should be based on a detailed understanding of all their attributes that includes, but is not limited to, epidemiological data. Further research is suggested to establish a theoretical basis to inform future multi-component designs.

A SE evaluation of school-based nutritional interventions also suggests that processes associated with the inter-personal level may facilitate policy objectives to improve eating behaviour. Interventions based upon the social interactions between children and school meal staff have had promising results. These have been achieved by removing the reliance on cognitive elements that may be under-developed in young children, such as SCT, and illustrate that *how* children are fed is as important as *what* they are fed. This suggests that, although consumption is associated with health outcomes, it is important to understand how children acquire their consumption behaviours, thence factors which influence the acquisition process. A more detailed understanding of the social interactions operating at the inter-personal level and their impact upon intra-personal characteristics of the child, giving due consideration to how these may be harnessed by school-based policy initiatives is required.

2.6 Summary

Epidemiological data suggest that nutritional behaviour in both childhood and adulthood is associated with chronic health conditions such as obesity, heart disease, cancer and stroke in later life. Although consumption of F/V is a protective factor against heart disease, cancer and stroke, consumption levels fall below government recommended values, particularly in areas of socio-economic deprivation. Conversely, consumption of fat/salt is a risk factor for the same diseases, yet consumption exceeds DRVs, again, most particularly in areas of socio-economic deprivation. Low levels of F/V intake and high levels of obesity are also evident in children, in whom poor diet can adversely affect development and behaviour, and has been associated with increased incidence of diseases

such as cancer and CVD in adulthood. Thus, the challenge for policymakers is to encourage behaviours that promote health, discourage those that pose a risk to health, and exploit the potential of early intervention in childhood to improve health in adulthood.

In support of this, theoretical explanations of health and behaviour fall within two broad domains that address the development of human behaviour, and the identification of health determinants. Theories of human development variously suggest that behaviour develops through learning, albeit subject to limitations imposed by cognitive maturation, particularly during the first twelve years of life, and that behaviour develops within a SE context. The determinants of health identified within models such as Dahlgren's rainbow also define multiple levels of influence on health. Thus, both theoretical domains recognise the importance of social ecology with respect to the dynamic inter-relationships between individuals and the environment.

Contemporary health improvement approaches include health education which targets individuals; and, structural approaches based upon understanding the social determinants of health and inequity in health, and promoting health by establishing enabling environments (settings) that empower individuals to take control over their health. To this end, the WHO has engaged with SE principles, recommending strategic health policies that create supportive environments wherein individuals are empowered to take control over their health. Indeed, health promoting schools (HPS) feature prominently in health improvement policy. They are organised around SE principles and typically address major health-related issues, such as nutrition, thereby making an important contribution to health improvement objectives by creating a healthy setting that nurtures the health of individuals associated with it. The implementation challenges inherent within WHO and HPS policies are supported by SE health improvement frameworks which emphasise the reciprocal relationships between individuals and environmental contexts. In particular, the McLeroy model is a holistic model of health promotion that closely aligns with SE models of human development and the determinants of health which has been successfully used to inform many studies of behaviour and behaviour change. This framework identifies multiple, inter-related leverage or evaluative points at policy, community, organisational, inter-personal and intra-personal levels.

Evaluating school-based nutritional interventions against a SE framework suggests several directions for future research into health improvement and school nutrition. The HPS framework is a SE model of a settings approach to health promotion based upon the whole school approach to learning. Whole school approaches complement the formal educational curriculum by pupils' experiences within the wider school context. Health improvement within schools is achieved, in part, by health education as defined by National Curricula. However, research has identified that children's nutritional behaviour does not always reflect their nutritional knowledge. The school meal service, meanwhile, has been used to improve childhood nutrition since the turn of the 20th century. In the 21st century, it is an essential criterion within the HPS framework and is also the subject of national policies which aim to transform the service, most particularly by improving nutritional guidelines for school meals. Pupil consultation using SNAGS is regarded an essential part of this transformation process. However, power relations and adult-centred approaches are inherent within SNAGS suggesting that they may not be an optimum engagement mechanism, particularly for young children. Research also suggests that the effectiveness of these policies is at risk because children are often unwilling to consume the nutritionally balanced meals on offer. Thus, a top-down SE evaluation commencing at the policy level, suggests that well-intentioned initiatives emanating at this level are failing to trigger processes capable of modifying behaviours located at the intra-personal level. On the other hand, the literature suggests that processes associated with the inter-personal level (i.e. social meal-time relationships) have been successful in improving eating behaviour in schools. This suggests that a bottom-up SE analysis commencing at the intra-personal level that explores eating behaviour and its relationship with higher-level SE processes may facilitate greater alignment between policy triggers and behavioural change mechanisms.

Chapter 3 Socio-ecological processes associated with eating behaviour

Human behaviour, including eating behaviour, is located at the intra-personal level of the McLeroy model but it is clear from the literature that processes within and between higher SE levels are important in fashioning behaviour. The literature suggests that eating behaviour is both acquired and modified through processes associated with the inter-personal and organisational levels. A detailed understanding of these processes and their potential triggers may complement ongoing policy initiatives and ensure that future health improvement programmes are both synchronised and holistic.

3.1 Intra-personal characteristics of eating behaviour

From a psychological perspective, the principal eating behaviours in humans are consumption, choice and liking⁷ which are learned via mechanisms such as social learning, classical conditioning and operant conditioning.

3.1.1 Theoretical perspectives on eating

At the intra-personal level of analysis, the act of eating lies at the intersection of a multiplicity of physiological, psychological, ecological, economic, political, social and cultural processes (Beardsworth & Keil, 1997). It is arguably the psychological literature that will yield the detailed theoretical understanding of nutritional *behaviour* required to inform future health improvement research. Eating is a complex area of research that attracts the interest of scientists within multiple disciplines including nutritionists, anthropologists, biochemists, psychologists and physiologists (Blundell & Halford, 1994). The physiology of eating largely relates to the human digestive system and is outside the scope of this thesis which is more interested in eating behaviour. Nevertheless, it is important to recognise that physiology and behaviour are not mutually exclusive since, for example, appetite control involves a complex inter-relationship between behaviour, physiological processes and neurological activity (Blundell & Halford, 1994). The 'satiety cascade' is a series of behavioural and physiological events that occur after food intake that

⁷ Liking is an affective reaction to food rather than a behaviour but the collective term 'behaviour' is used to refer to consumption, choice and liking throughout this thesis to aid readability

inhibit eating until hunger signals return (Bellisle, 2008). The homeostatic⁸ functions relevant to the regulation of energy intake have also been widely researched. Such studies have contributed to the understanding of, for example, the brain areas associated with feelings of hunger and satiety elicited by visual food cues (Cornier, Von Kaenel, Bessesen, & Tregellas, 2007). Indeed, a relatively new area of research is beginning to shed light on the neurological aspects of eating due to advances in brain imaging technology. For example, suppressed dopamine receptors have been associated with increased motivation to consume food in obese subjects (Wang, Volkow, Thanos, & Fowler, 2009). Genetic studies have also revealed an obesity-related gene which promotes responsiveness to internal signals of satiety (Wardle, Llewellyn, Sanderson, & Plomin, 2009).

Sociological interest in food and eating gathered momentum in the 1990's through the study of patterns of food allocation, consumption, production and distribution, and the meanings and actions associated with food preparation, acquisition and consumption (Beardsworth & Keil, 1997). The structuralist approach to food adopted by Levi-Strauss and followers viewed food tastes as culturally shaped and socially controlled such that food, like language, is a link to the unconscious attitudes of society (Caplan, 1996). In *Raw and the Cooked* (1994), Levi-Strauss explored the mythology of the Brazilian Bororo Indians to show that food is not just nutritional, but linked to social relations (inclusion/exclusion) and cultural ideas (edible/inedible) as well as body and health.

Eating behaviour also has socio-cultural implications associated with its role in cuisine and characteristics of cultural life (Blundell & Halford, 1994). Cultural characteristics such as ethnicity or religion influence many characteristics of the food system. For example, Halal and Kosher food laws observed by Muslim and Jewish populations respectively, define the types of food consumed, together with its means of production, slaughter, storage and cooking (Regenstein, Chaudry, & Regenstein, 2006). It has also been established that cultural differences in eating behaviour exist (Musher-Eizenman, de Lauzon-Guillain, & Holub, 2009). For example, French diets are characterised by smaller portion sizes and greater variety and are generally considered healthier and associated with lower weight

⁸ Homeostasis is the maintenance of metabolic equilibrium by several complex biological mechanisms that operate via the autonomic nervous system

status. In comparison with the US, the French take more pleasure in food and are less concerned about health. Parental attitudes to child feeding are also culturally patterned. For example, US parents tend to allow children more control, and use food to reward behaviour and control emotions whereas French parents tend to teach their children about food and encourage balance and variety. Cultural differences also exist in the timing of meals and associated portion sizes (de Castro, 1977). For example, in the US and the Netherlands, meal sizes increase throughout the day whereas in France, the largest meal tends to occur in the afternoon and there are greater intervals between meal times. In multi-cultural societies, it has been suggested migrants become nutritionally acculturated in that they acquire the cultural norms and behaviours of their host country in preference to their native country (Seth et al., 2007).

The literature relating to the current school food transformation programmes, meanwhile, exemplifies some of the political (e.g., school meal policies) and economic (e.g., income generated from school meals) aspects of eating. In addition, economic disadvantage has been associated with health outcomes such that promoting good childhood nutritional intake is viewed as an effective means of addressing health inequities (Marmot, Friel, Bell, Houweling, & Taylor, 2008). From a sociological perspective, however, Bourdieu (1984) rejected the idea that income is the main determinant of food consumption since it does not account for different consumption patterns at same levels of income. For Bourdieu, taste is the true determinant and differences in food consumption are either based on acquired tastes for luxury, due to the freedom associated with capital, or necessity. Tastes are also influenced by class related norms such as eating speed (fast/slow); eating together or in designated dining rooms; or, the effects on health and body shape.

The psychology of eating covers aspects such as the psycho-social correlates of eating behaviour (e.g., Bosch, et al., 2004), together with developmental, cognitive and psycho-physiological aspects of eating (Ogden, 2003). These concepts are closely associated with the intra-personal level and also with issues identified within the literature such as interventions being inappropriate for the cognitive stage of the child, and previous school-based nutritional interventions generally producing disappointing outcomes (e.g., Blanchette & Brug, 2005; Burchett, 2003; Ciriza, Perez-Rodrigo, & Aranceta, 2008; de Sa & Lock, 2008; French & Stables, 2003; French & Wechsler, 2004). The psychological

literature, therefore, should provide a detailed theoretical understanding of nutritional behaviour for suitable for informing future health improvement initiatives.

3.1.2 Principal eating behaviours

The principal eating behaviours defined within the literature are consumption, choice and liking. Consumption of any food presupposes its availability, and is then influenced by choice and liking (Rozin, 1989). The school meal service which features prominently on policy agendas (C. E. L. Evans & Harper, 2009) can be conceptualised as a food availability mechanism, suggesting that a detailed understanding of consumption, choice and liking is an important pre-cursor to school-based health improvement initiatives⁹. Consumption relates to the ingestion of food and is often referred to as 'intake'. Food neophobia¹⁰ is the rejection of a novel food and is a phenomenon exhibited by all omnivores, including humans, that protects against ingestion of toxic substances (Rozin, 1976). It operates primarily in the visual domain such that foods are rejected prior to tasting (Dovey, Staples, Gibson, & Halford, 2008). Whereas children are willing to eat a wide variety of foods at age 1-2 years, neophobia results in this willingness declining to its lowest levels by age 4 years (Cashdan, 1994). Thereafter, neophobic behaviours decrease across the primary school age group (Pliner & Loewen, 1997), and linearly with age from 10 years through adulthood (Mcfarlane & Pliner, 1997). This does not imply that rejection of novel foods will not be encountered amongst primary school children. Younger children may be primarily used to foods encountered in the home. Therefore, the introduction of new school meal menus as a result of the revised nutritional guidelines introduced by the school meal transformation programmes (C. E. L. Evans & Harper, 2009) may elicit resistance from the children. Such resistance could be attributable to neophobia, or possibly to faulty schemas regarding the palatability of novel foods (Loewen & Pliner, 1999) or the acceptability of the look/smell of the food (Dovey, et al., 2008). Picky eaters are also reluctant to accept new foods but picky eating has been differentiated from neophobia in that it relates to the rejection of foods that have already been tasted (Dovey, et al., 2008) Picky eating involves eating a limited variety of foods, requesting specific

⁹ It should be noted that although consumption choice and liking appear to be straightforward concepts, the literature often introduces ambiguity by substituting all of them by a closely related term - 'preference'. To avoid this, the term 'preference' will not be used to represent an eating behaviour in this thesis.

¹⁰ Neophobia is an avoidance behaviour exhibited as a reaction to a new object (Barnett, 1963), such as a novel food

food preparation methods and having strong dislikes (Jacobi, Agras, Bryson, & Hammer, 2003). However, there is no precise measure or definition of picky eating and it is not a well researched area (Dovey, et al., 2008).

Liking, meanwhile, is an affective response to food. The term is often used interchangeably with 'choice' (Rozin, 1989), and liking and choice are often congruent, e.g., an individual may like X but choose Y, since Y may be cheaper, or X may be harmful to health. Whereas the liking of sweet tastes and the rejection of sour and bitter tastes are innate, all other taste likes/dislikes have to be learned (Coward, 1981). Liking is a powerful determinant of food choices (L. Cooke, 2007) and, ultimately, consumption, such that, in 3-4 year old children, the correlation between food likes/dislikes¹¹ and consumption is 0.8 (Birch, 1979b). Food dislikes can lead to food rejection, either on the basis of sensory properties such as taste, smell or texture, or due to its association with illness (Batsell Jnr, Brown, Ansfield, & Paschall, 2002). Indeed, children use liking/disliking as a food classification system rather than attributes such as healthiness (K. H. Hart, et al., 2002). In the home context, it has been shown that liking is not an eating behaviour that mothers of young children generally seek to achieve (S. N. Moore, Tapper, & Murphy, 2010). However, little is known about the eating behaviours that school based caregivers seek to achieve.

For the purposes of this study, choice will be defined as the selection of one food item over another as per Rozin¹² (1989). Choice has been an inherent feature of school meals since the 1980s as the child, more-so than the adult, can decide whether or not to receive a school meal and thence, the food items they desire. However, there is evidence to suggest that the absence of a significant adult overseeing the child's choices can have a negative impact (Klesges, Stein, Eck, Isbell, & Klesges, 1991). This study presented 4-7 year olds with a wide range of foods categorised as being of low, moderate and high nutritional value. A healthy diet could have been constructed out of the food presented provided that it included a sensible balance of all three categories, but primarily from the higher two categories. The children were asked to choose (but not eat) from the selection given, and

¹¹ Readers of the work of Birch and colleagues should note that the term 'preference' is used to refer to what this thesis refers to as 'liking' (e.g., Sullivan & Birch, 1990)

¹² Readers of Rozin's work should note that he uses the term 'preference' to refer to what this thesis refers to as 'choice'

then to re-choose on a second occasion whilst a parent was watching. The parent was then given the opportunity to comment on the choice. The choices differed when the parents were watching in that less of the low nutritional food was chosen, but this was not compensated for in increased choices from the other two categories. It has also been shown that, despite being familiar with the concepts of healthy eating (Dixey, Sahota, Atwal, & Turner, 2001; Warren, et al., 2008), children's food choices often do not reflect their nutritional knowledge (K. Brown, et al., 2000; Hamilton-Ekeke & Thomas, 2007; Noble, Corney, Eves, Kipps, & Lumbers, 2000). Indeed, Piagetion theory suggests that children under 11 years may be unable to undertake the cognitive work required to associate food knowledge with eating outcomes in order to make effective choices because their thoughts are based upon concrete objects rather than verbal hypotheses (Contento, 1981; Piaget & Inhelder, 1969). Indeed, the suitability of SCT as the theoretical basis for nutritional interventions targeted at children has been questioned since its explanatory power for children is not understood (Resnicow, et al., 1997) which emphasises the need for health improvement initiatives based on behavioural modification to be age-appropriate.

The principal eating behaviours identified by the literature, therefore, are consumption, choice and liking. These behaviours are inter-related, but can also become maladapted as in the case of (e.g.,) food neophobia, picky eating and poor choice making skills. In order to further understand potential influences on these behaviours, it is first necessary to establish the theoretical bases underpinning their acquisition.

3.1.3 The acquisition of eating behaviours

Children acquire their eating behaviours through learning mechanisms such as social learning, operant conditioning and classical conditioning suggesting that these may be the mechanisms most suited for behavioural change programmes, particularly in younger children. Research has shown that children *learn* to eat during the transition from a diet of milk in infancy to an adult, omnivorous diet (Birch, 1998) and that food preferences become relatively stable at about age 7 (Kelder, Perry, Klepp, & Lytle, 1994). This suggests the importance of understanding the cognitive ability of young children in order to assess the implications for behavioural change mechanisms selected for use within health improvement interventions. The two learning mechanisms most commonly used to improve children's nutrition have been SCT and curriculum based nutritional education,

both of which have proved problematic with respect to the modification of eating behaviour (Noble, et al., 2003; Resnicow, et al., 1997). Knowledge about the benefits and costs associated with eating foods which the UK national curricula seek to impart (Learning and Teaching Scotland, 2009; Noble, et al., 2003; Qualifications and Curriculum Authority, 2009; Resnicow, et al., 1997; Welsh Assembly Government, 2008b, 2008c) is an important part of food choice (Wardle, 1995). However, although young children may exhibit food-related knowledge, Piagetion theory would suggest that they may not be able to undertake the cognitive work required to associate it with eating outcomes in order to make effective choices. This is because 7-11 year olds are traversing the period of concrete operations when their thoughts are based directly upon objects rather than verbal hypotheses (Piaget & Inhelder, 1969).

Contento (1981) undertook a study that tested children classified according to their Piagetion developmental stage about their thoughts on food and eating. She demonstrated that concrete-operational children (age 7-11) did not consider snacks to be food and, consequently, any ideas they might have about how 'good' or 'bad' food may be, did not apply to snacks. Even though some children in this age group would use nutrient related terms (e.g., 'vitamins') they demonstrated no understanding of 'nutrients', consistent with their traversing a developmental stage where abstract concepts cannot be understood. Pre-operational children (age 5-7) were unable to comprehend multi-tier food groupings where vitamins appear well down the hierarchy. Another study showed that primary schoolchildren construct food groupings based on concrete groups such as typical meal compositions i.e. bread is grouped with butter (K. H. Hart, et al., 2002). It is not until pre-adolescence that the child is liberated from concrete thought in favour of an interest in the non-present and transformations based on deduced events (such as long term health outcomes). Contento suggests that no amount of teaching will make children learn nutritional concepts that are beyond their capabilities and recommends that nutritional education consists of giving information coupled with real world experiences.

The ability for abstract thought, meanwhile, is essential to SCT's principle of outcome-expectations (Bandura, 1986). Furthermore, SCT requires other cognitive skills such as forethought to test possible solutions and outcomes prior to action; or, goal setting and the motivation to achieve them. Research has shown that children's eating behaviour cannot be

explained in terms of social-cognitive variables such as outcome-expectations or self-efficacy which are under-developed in pre-adolescent children (Resnicow, et al., 1997). Similarly, there are a number of health behaviour models which consider the influence of attitudes and norms on behaviour, e.g., the Theory of Planned Behaviour (Ajzen, 1991), but again, the predictive ability of such models with respect to primary schoolchildren's food choices has been questioned (Folta, Bell, Economos, Landers, & Goldberg, 2006). Consequently, in the primary school age group, the modification of eating behaviours using techniques such as social learning, classical conditioning and operant conditioning that place less emphasis on cognitive elements is recommended (Resnicow, et al., 1997).

An operant behaviour is one which is voluntary and has consequences for the individual which may be positive (e.g., satiating hunger) or negative (e.g., illness) (Skinner, 1974). The likelihood of operant behaviours re-occurring is influenced by these consequences. This process is known as operant conditioning. Positive reinforcers strengthen behaviours that produce them, negative reinforcers strengthen behaviours that reduce them and punishments eliminate behaviours.

Social Learning Theory (SLT), meanwhile, espouses that human behaviour can be learned through observation by modelling one's own actions on those of another (Bandura, 1986). Such vicarious learning means that each individual does not have to commence the learning process using trial and error and, as such, is essential for survival. Imitation is the copying of a novel or otherwise improbable act for which there is no instinctive tendency (Thorpe, 1963) and requires both motor and cognitive skills (Piaget, 1951). According to Bandura (1977, 1986), observational learning can be broken down into a number of sub-processes which need to be understood by those seeking to use it as a conduit for learning, particularly in children. First of all, the observer must attend to the modelled event. Attracting attention is an issue with children, for example, the event must be relevant to them and the duration of the modelled event should be short. Seeing models rewarded or punished raises attentiveness. The observer must then accurately perceive the modelled event and observational learning develops in line with the cognitive ability of the child since their perceptual abilities (e.g., depth, length, distance) play a key part. It may be necessary to break down complex behaviours into smaller parts for learning and repeated exposure to the modelled event may be necessary. The third sub-process is for the observer

to be able to remember what is seen. Opportunities to practice the behaviour, both cognitively and practically, will aid remembering. Next, the remembered behaviour has to be converted into action, at which point, the motor skills of the observer are important. Finally, the observer has to be motivated to perform the behaviour, possibly through using rewards. Furthermore, SLT espouses that effective models have a number of attributes including age, gender, status and their perceived competence in the modelled act (Bandura, 1986). Inter-personal attraction is essential to channel the attention of the observer onto the model (Bandura, 1977). For children, the power to give out rewards is important but punitive power reduces the modelling power (Bandura, 1986).

Classical conditioning is based on the relationship between stimuli and responses. An unconditioned response (UR) is a reflex to a stimulus (the 'unconditioned stimulus' or US). Classical conditioning is said to have occurred when the same response (the 'conditioned response' or CR) is elicited by a new stimulus to which the organism is initially indifferent (the 'conditioned stimulus' or CS), having been paired initially with the US (Pavlov, 1927). Food likes and dislikes are learned through repeated experiences with food (Birch & Fisher, 1995) such that the food becomes associated¹³ with the consequences of eating it (Batsell Jnr, et al., 2002). These consequences (UR) may be sensory (e.g., taste); the results of ingestion (e.g., satiety, vomiting); affective (e.g., pleasure, distress); or social (e.g., rejection/acceptance). An example of learning via classical conditioning prevalent in western cultures is where a liking for foods high in energy/fat/sugar develops as a consequence of being served in pleasurable situations such as holidays, celebrations or as rewards (Birch & Fisher, 1995). Indeed, it is known 'beyond any reasonable doubt' (de Houwer, Thomas, & Baeyens, 2001, p866) that liking can be modified by pairing neutral stimuli with affective stimuli. This illustrates the importance of the social affective context of feeding.

The child's relationships with primary groups, such as parents or school-friends, is central to both EST (Bronfenbrenner, 1979, 1986) and SE models of health promotion such as the McLeroy model. For example, providing non-contingent, but positive attention has been

¹³ Much of the literature in the food domain uses the term 'associative conditioning' for this process (e.g., Birch & Fisher, 1995)

shown to increase a child's liking for food (Birch, 1981; Birch, Zimmerman, & Hind, 1980) suggesting that the child's affective reaction to the food context may be incorporated into their affective reaction to the food. Furthermore, this has been shown to generalise to other foods within the same food group (e.g. fruits), provided the child has the cognitive ability to group foods into categories which is thought to emerge at around 4 years of age (Birch, 1981). However, feeding situations can sometimes involve social conflicts which the child commonly 'loses', experiencing negative affects (e.g., loss of control or helplessness) which can result in foods being rejected over the longer term as a means of re-asserting control (Batsell Jnr, et al., 2002). In scenarios such as these which involve affective responses, a variant of classical conditioning known as 'evaluative conditioning' is thought to be involved.

Evaluative conditioning (EC) was first described by Levey and Martin (1975) as the conditioning of an 'evaluative response' (ER) to a stimulus. They argued that, in humans, evaluation alone was necessary and often sufficient for learning, i.e. the final CR/UR was less important, although later studies into taste aversions disagreed that EC is sufficient for learning (Rozin, Wrzesniewski, & Byrnes, 1998). Although this associative transfer of valence is procedurally similar to classical conditioning, the deep underlying processes are different (de Houwer, et al., 2001). An important distinction is that EC is highly resistant to extinction, i.e., it persists after the US is removed. Proponents of EC would argue that a socially mediated example of EC is social learning (Rozin, et al., 1998).

In summary, consumption, choice and liking are eating behaviours operating at the intra-personal level which are learned through mechanisms such as social learning, classical conditioning and operant conditioning. Their use as theoretical frameworks for behavioural change programmes targeted at young children has been recommended. In addition, it is clear from the literature that these learning mechanisms are associated with a social context suggesting that they could be invoked by processes operating at the inter-personal level.

3.2 Inter-personal processes associated with eating behaviour acquisition

The learning mechanisms through which eating behaviours such as consumption, choice and liking are acquired and modified are invoked by feeding strategies which are used

during food-related social interactions (Birch, 1998). The associated theory has been successfully used in interventions based in homes, schools and clinical settings suggesting that it could reliably form the basis of health improvement initiatives.

3.2.1 Taxonomy of feeding strategies

In the (human) food domain, feeding strategies are techniques, usually used during social interactions, whereby an individual seeks to influence the feeding behaviour of a child. For the purposes of this study, the descriptions of these feeding strategies found within the literature have been used to define a classification system comprised of five categories: a) modelling; b) repeated taste exposure (RTE); c) restricting access to food; d) pressuring strategies, including rewards used in a coercive context; and e) encouraging strategies, including rewards used to signify achievement.

Modelling and RTE strategies are based upon formal theories. Modelling is a process whereby human behaviour is learned by observation as a result of basing one's own actions on those of another and is a central principle of Social Learning Theory (SLT) (Bandura, 1977). The principles behind RTE, meanwhile, originate from the 'mere exposure hypothesis' which states that repeatedly making a stimulus available for an individual to perceive is sufficient to enhance their liking for that stimulus (Zajonc, 1968). With respect to food stimuli, a preliminary study using 3-4 year old children and seven exposures failed to support the hypothesis (Birch, 1979a). However, not all the food stimuli used were novel and it is novel stimuli that exposure is hypothesised to work upon. A later study was successful in demonstrating the exposure effect in adults using novel olfactory/gustatory stimuli (Pliner, 1982). To assess how necessary exposure to foods is, it is useful to explore what it might serve to achieve. Pliner (1982) suggests that repeated exposure may dissipate food neophobia due to the 'learned safety' resulting from repeated consumption of a new food not being followed by negative post-ingestive consequences (Birch, Gunder, Grimm-Thomas, & Laing, 1998). Repeated exposure may also serve to associate positive physiological consequences with taste (Pliner, 1982) or to disconfirm food schemas that novel foods will be unpalatable (Loewen & Pliner, 1999). On the other hand, the 'mere exposure hypothesis' implies that the response elicited by exposure to food is liking. It has been shown that liking is a powerful determinant of consumption (Birch, 1979b) and that up to 51% of the variation in liking in 3-4 year olds can be explained by familiarity with

food. Therefore, the more familiar the child is with the food, the more they like it and the more of it they consume (Birch, 1979a, 1979b).

In the context of feeding strategies, ‘restriction’ involves limiting access to *specific* foods by controlling portion size or how frequently the food is offered (J. O. Fisher & Birch, 1999b). In general, the foods restricted are those perceived as undesirable and the probable intention is to encourage consumption in moderation. Examples of restriction taken from the Child Feeding Questionnaire (CFQ) include limiting access to sweets, junk food or high-fat foods (Birch et al., 2001).

Pressuring feeding strategies, meanwhile, involve attempts to get a child to eat against their will. Specific examples taken from the CFQ include requiring the child to eat everything on the plate, or to eat when they are not hungry (Birch, et al., 2001) Where rewards are used to coerce a child to do something they might otherwise be reluctant to do, they can be categorised as pressuring feeding strategies. There are several socio-psychological theories on how rewards influence behaviour. Dominant theories within the food-reward domain include, but are not limited to, over-justification effects (Lepper & Green, 1978), response deprivation effects (Timberlake & Allison, 1974), intrinsic motivation (Deci, 1971), and the discounting principle’ (Sedlak & Kurtz, 1981)¹⁴.

Encouraging feeding strategies involve making a food related suggestion to the child, typically a verbal prompt (e.g, ‘Would you like...?’) (M. B. Schwartz, 2007). They differ from pressuring feeding strategies in that the child has the freedom to decide how they respond to the prompt. Rewards can also be considered as encouraging, rather than pressuring, feeding strategies, when they are used in positive social scenarios, or to signify achievement. Such rewards may be intangible, for example, verbal praise (Birch, Marlin, & Rotter, 1984), or tangible, for example, stickers (Horne, et al., 2004).

An extensive literature base drawn from studies employing experimental/quasi-experimental or correlational designs has established that all these feeding strategies influence food consumption, choice and liking.

¹⁴ A brief overview of these and their relationship to children is available in Appendix E

3.2.2 The influence of modelling on eating behaviour

Studies into modelling feeding strategies have provided evidence regarding the attributes of effective models, the behaviour influenced, the foods affected and the characteristics of the modelled acts (see Table 8). Seminal works on the social modification 2-6 year olds' food choices were conducted by Duncker (1938) and Marinho (1942) who were able to show that peers and fictional heroes portrayed in stories were effective models, although adults were not. Later studies suggest that effective models are peers (Birch, 1980; Greenhalgh et al., 2009; Hendy, 2002); fictional cartoon heroes (Horne, Lowe, Fleming, & Dowey, 1995; Lowe, Dowey, & Horne, 1998); teachers (Hendy & Raudenbush, 2000); and, adults (Adnessi, Galloway, Visalberghi, & Birch, 2005; Harper & Sanders, 1975). A further study which adopted a correlational (rather than experimental) design found a positive association between F/V consumption and parental modelling in 7-9 year old children (Cullen et al., 2001). In addition, familiar adults are more effective models than unfamiliar adults (Harper & Sanders, 1975) and peer models are more effective models than teachers when both are present (Hendy & Raudenbush, 2000). Furthermore, peers making negative comments about foods can have detrimental effects on consumption which are resistant to extinction (Greenhalgh et al., 2009).

Table 8 Studies into the effects of modelling on eating behaviour

STUDY	EXPERIMENTAL CONDITIONS	PARTICIPANTS	KEY FINDINGS
Peer modelling (Duncker, 1938)	[1] Peer modelling food choices, subject:model ratio 1:1/2/3. Exposure – 1, with 3/2 control scenarios before/after modelling condition [2] Adult modelling food choices [3] Fictional stories of ‘heroes’ food likes Outcome measure: Choice Long term follow up: See (Marinho, 1942)	English nursery children aged 2-5	<ul style="list-style-type: none"> • Children’s food choices influenced by peers and fictional heroes but not adults. • Effects of story last for 6-15 days
Peer modelling (Marinho, 1942)	3 week pre-assessment of choices. Control group plus 3 experimental groups with strong/ variable/no preference for target food Exposure: Multiple Outcome measure: Choice Long term follow up: 1 year	66 Brazilian children aged 4-6	<ul style="list-style-type: none"> • Changes in choice persist for 1 year where child had no strong preference initially
Peer modelling (Birch, 1980)	All participants pre-assessed for liking of 9 veg Target and model have opposite likes/dislikes, model chooses food first Target:Model ratio 1:3 or 4 17 target/model groups assessed Exposure: 1 Post assessment: 1-8 weeks Outcome measures: Consumption, choice, liking Long term follow up: None	39 American children, middle-class, aged 2-11 years of mixed ethnicity	<ul style="list-style-type: none"> • Compared with peers, target children exhibited: <ul style="list-style-type: none"> • Increased choice (p <0.001) • Higher consumption (p <0.07) • Increased liking (p<0.05)

STUDY	EXPERIMENTAL CONDITIONS	PARTICIPANTS	KEY FINDINGS
Peer modelling (Brody & Stoneman, 1981)	Models point to pictures of their 'favourite' food during a modelling session [1] Subject:model ratio 1:1 [2] Subject:model ratio 2:1 Outcome measure: Choice Exposure: 1 Long term follow up: None	[1] 6 children aged 4-8 in same sex pairs [2] 9 boys aged 5-9 Caucasian (US)	<ul style="list-style-type: none"> • Effective peer models should be older or the same age as the target child
Peer modelling (Hendy, 2002)	Verbal peer modelling, 3 novel foods assigned to no model, boy model, girl model; conditions Subject:model ratio: 1:1 or 2 Outcome measures: Consumption, choice Exposure: 5 in 1 wk (3 control, 2 modelled) Long term follow up: 1 month liking assessment of models and subjects	94 children for whom targeted foods were novel, mean age 54.8 months, American, mostly Caucasian	<ul style="list-style-type: none"> • Girl models more effective at increasing food acceptance than boys. • Effects extinct after 1 month • Consumption effects persisted in the models who had received toy reinforcers during training
Peer modelling (Greenhalgh, et al., 2009)	[1] Negative verbal modelling [2] Positive verbal modelling [3] No modelling (control) Control group, negative verbal modelling and positive verbal modelling groups Subject:model ratio: 1:4 Outcome measure: Consumption Exposure: 4 in 3 hrs (2 modelled, 2 not) Long term follow up: None	Study was conducted twice: <ul style="list-style-type: none"> • 35 children aged 5-7 years • 44 children aged 3-4 UK (Wales)	<ul style="list-style-type: none"> • Negative peer modelling inhibits novel food consumption and is resistant to extinction

STUDY	EXPERIMENTAL CONDITIONS	PARTICIPANTS	KEY FINDINGS
Modelling by fictional heroes (together with rewards) (Horne, et al., 1995)	Target food and control food, both disliked Food Dudes cartoon heroes enthusiastically consuming target food e.g., guava. Rewards (e.g. t-shirt) or promise of a reward (outing). Conducted in subjects' homes Outcome measure: Consumption Exposures: 6-10 over 5days - 1 st baseline 1 - 1 st intervention 3 daily - 2 nd baseline 1 per wk for 7 wks - 2 nd intervention Long term follow up: 2 months, 6 months	4 children aged 5-7 years UK	<ul style="list-style-type: none"> • Modelling coupled with rewards increases consumption • Effects sustained for fruit (but not vegetables or pulses) <p>See Section 0 for a discussion on the findings with respect to the use of rewards</p>
Modelling by fictional heroes (together with rewards) (Lowe, et al., 1998)	As above but Food Dudes refer to food groups (e.g. vegetables) rather than specific foods. 12 target foods used per child Outcome measure: Consumption Exposures: 3 of 4 foods - 1 st baseline various - 1 st intervention 5 of 4 foods - 2 nd baseline 30 - 2 nd intervention Long term follow up: 2 months, 6 months	4 children aged 5-7 years UK	<ul style="list-style-type: none"> • Increases in consumption achieved with modelling coupled with rewards generalises across food groups
Adult modelling (Jansen & Tenney, 2001)	A parent/caregiver enthusiastically consuming the same yoghurt as the child Subject:model ratio: 1:1 Outcome measure: Liking Exposures: 9 (over 1-2 weeks) Long term follow up: None	39 children aged 4-7 years (Netherlands)	<ul style="list-style-type: none"> • Adults modelling food consumption increases liking for that food • Modelling effects are food specific i.e. more effective for a high-energy yoghurt than a low-energy yoghurt.

STUDY	EXPERIMENTAL CONDITIONS	PARTICIPANTS	KEY FINDINGS
Adult modelling (Adnessi, et al., 2005)	[1] Adult silently eating same food as child [2] Adult silently eating different food [3] Adult presence (control) Exposure: 1 Outcome measure: Consumption Long term follow up: None	27 Children, middle- class, aged 2-5 years of mixed ethnicity (American)	<ul style="list-style-type: none"> • Silent modelling same food is more effective than no modelling or silent modelling of a different food ($p < 0.05$). • No significant difference between no modelling / silently modelling a different food
Teacher modelling, peer modelling (Hendy & Raudenbush, 2000)	[1] Silent teacher eating familiar food [2] Silent teacher eating novel food [3] Teacher eating one novel food with enthusiastic verbalisations [4] Teacher eating one model food, peer eating another, both with enthusiastic verbalisations Controls: [1,2] 1 group, no modelling [3,4] Control food on table Subject:model ratio: 1:3-5 Exposure: [1,2] 3 over 1 week [3,4] 5 over 1 week Outcome measure: Consumption	[1] 34 children mean age 56.7 months [2] 23 children mean age 52.9 months [3] 26 children mean age 52.7 months [4] 14 children mean age 51.4 months American, mostly Caucasian	<ul style="list-style-type: none"> • Silent teacher modelling is ineffective for both novel and familiar foods • Enthusiastic teacher modelling is effective • Peers are more effective models than teachers

NOTES:

The subject:model ratio indicates the relationship between the number of participants (children) and the number of models.

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Given the number of peers likely to be present in school dining halls and the possibility for natural acts of modelling to occur, these two findings are concerning. Amongst peer models, girls have been shown to be more effective than boys, and same age or older models more effective than younger models (Brody & Stoneman, 1981).

The behaviours that modelling has been shown to influence in children include consumption, choice and liking (Birch, 1980). The effects may be confined to the specific food that was the target of the strategy rather than generalising to other (or all) foods (Adnessi, et al., 2005). A study by Jansen and Tenney (2001) also found modelling consumption to be more effective for a high-energy yoghurt than a low-energy yoghurt. Another conducted by Hendy and Raudenbush (2000) suggested that the characteristics of the modelled act may be important. For example, silent modelling was not effective, whereas modelling accompanied by enthusiastic verbalisations ('Mmm! I love mangos!') was found to be effective for novel foods.

The methodological design of studies into modelling feeding strategies reveal some important factors that could influence the successful translation of the evidence base into practice within a school setting. These include the sample characteristics, subject:model ratio, the exposure frequency and presence of long term follow ups. Sample sizes have generally included less than fifty participants with a limited ethnic mix which may limit generalisation to, for example, a typical primary school population. Overall, the participants ranged in age from 2-11 years, although most studies focussed on younger children aged 4-5 (e.g., Jansen & Tenney, 2001). In school terms, this suggests that the evidence base is more robust for children at Key Stage 1 than Key Stage 2. However, modelling effects have also been observed amongst University students with respect to food choices (Hobden & Pliner, 1995). Some studies used scenarios with a one-to-one ratio between model and child (e.g., Brody & Stoneman, 1981; Jansen & Tenney, 2001), others used scenarios where the models outnumbered the participants (e.g., Birch, 1980) and vice versa (e.g., Hendy & Raudenbush, 2000). There is no definitive evidence as to the optimum ratio and in practical terms, the subject:model ratio is likely to vary by context and may be different in the primary school dining hall than in the experimental situations. Primary school sizes in Wales range from less than 25 to over 601 with 56% of schools having

between 101-300 pupils (Welsh Assembly Government, 2008d). The typical dining hall staff:child ratio is unknown, but could be influenced by school size. Previous studies either exposed the children to just one instance of modelling (e.g., Addessi, et al., 2005; Brody & Stoneman, 1981) or to multiple instances over a short time frame (e.g., Hendy & Raudenbush, 2000) (see Table 8). Reinforcement schedules are often required to guard against extinction of newly learned behaviours. There is limited information at the present time to inform decisions regarding timing of, or necessity for such schedules since none of the studies adopted longitudinal designs. Through re-collecting data after a follow up period, Duncker (1938) showed that the modelling effects resulting from storytelling persisted for 6-15 days. Marinho (1942) found that changes in the food choices of children that resulted from peer modelling persisted one year later, provided the child had no strong preferences for the food initially, although Hendy (2002) found that changes in food choice did not persist beyond one month. There is no evidence at present to suggest the number of modelling exposures or reinforcement schedules that may be required, or practical, in a dining hall setting.

In summary, the evidence base shows that consumption, choice and liking in primary school-aged children can be influenced by peers, adults (including teachers) and fictional hero characters acting as behavioural models. The 'practical and symbolic' benefit of the presence of school staff in dining halls is recognised within school meal transformation policy (Scottish Executive, 2002, p63). However, no practical or theoretical insights into how, or why, this should be achieved are made clear. Since school food transformation programmes aim to provide healthier menus, theory suggests that modelling feeding strategies may be important health improvement leverage points at the inter-personal level that could synergise with ongoing policy initiatives. In addition, modelling the consumption of school meals may influence primary schoolchildren's existing preferences to consume packed lunches (Nelson, et al., 2010). However, in terms of the applicability of these strategies in the school setting, it is unclear what subject:model ratios, exposure frequencies and reinforcement schedules might be required or practical. Further research is also needed to establish whether modelling is (or could be) a feature of the inter-personal relationships between staff and children in school dining halls.

3.2.3 The influence of repeated taste exposure on eating behaviour

Strategies based on repeatedly exposing foods to children are theoretically underpinned by Zajonc's mere-exposure hypothesis (1968). Table 9 summarises the studies which have examined the influence of RTE on children's eating behaviour. The first study to establish that the mere-exposure hypothesis (Zajonc, 1968) was applicable to children in the food domain was conducted by Birch and Marlin (1982) who showed that when two-year old children were asked to choose between two initially novel foods, the food that was chosen was typically the one to which the child had been most frequently exposed. A later study showed that, in the case of food stimuli, tasting the food, rather than just looking at it, is required for exposure effects to occur (Birch, McPhee, Shoba, Pirok, & Steinberg, 1987). In infants and pre-school children, RTE has been shown to increase food consumption (Birch, et al., 1998; Sullivan & Birch, 1994) food choices (Birch & Marlin, 1982; Birch, et al., 1987), and food likes (Sullivan & Birch, 1990). Increases in consumption have been shown to transfer to foods in the same food group but not to different food groups (Birch, et al., 1998). In infants, exposure effects transfer to similarly flavoured (i.e., sweet or salty) foods (Sullivan & Birch, 1994) although similar effects have not been found in pre-school children (Sullivan & Birch, 1990).

Evidence relating to the *number* of exposures required to influence eating behaviour is arguably the most important, and disputed, finding from these studies. The figure most popularly quoted is that 8-15 exposures are required which stems from a recommendation made by Sullivan and Birch (1990). However, even this study showed that the control group was willing to consume more of an unfamiliar vegetable on a second exposure even though their verbally expressed liking did not increase and Birch and colleagues later showed that the most marked increase in consumption began after the first exposure (1998). Since none of these studies adopted a longitudinal design or included a follow-up period, little is known about the need for reinforcement schedules. However, school dining halls may naturally facilitate more frequent exposures to foods over longer time than incorporated into the experimental settings but further research would be needed to establish this.

Table 9 Studies into the effects of repeated taste exposure on eating behaviour

STUDY	EXPERIMENTAL CONDITIONS	PARTICIPANTS	KEY FINDINGS
(Birch & Marlin, 1982)	<p>[1] 5 unfamiliar cheeses presented during 2,5,10,15,20 exposures</p> <p>[2] 5 unfamiliar fruits presented during 0,5,10,15,20 exposures</p> <p>Exposure frequency: 1 per day over 6 weeks</p> <p>Outcome measure: Choice</p> <p>Long term follow up: None</p>	<p>[1] 6 children aged 2 years</p> <p>[2] 8 children aged 2-3 years (American)</p>	<ul style="list-style-type: none"> • Foods chosen by children are those to which they are more frequently exposed • First test on children in food domain
(Birch, et al., 1987)	<p>7 novel foods presented to each child:</p> <ul style="list-style-type: none"> - 3 for tasting 5, 10, 15 times respectively - 3 to look at for 10 seconds 5,10, and 15 times - 1 merely present. <p>Outcome measure: Choice</p> <p>Exposure frequency: 1 per day over 30 days</p> <p>Long term follow up: None</p>	<p>Children assigned to 3 age groups:</p> <p>[1] 4 with mean age 26 mths</p> <p>[2] 15 with mean age 38 mths</p> <p>[3] 11 with mean age 64 mths (American)</p>	<ul style="list-style-type: none"> • Taste exposures are more important than visual exposures in children aged 2-5 years
(Sullivan & Birch, 1990)	<p>Liking of <i>all</i> experimental foods assessed during pre- and post- exposure periods. 3 exposure groups:</p> <p>[1] Novel food</p> <p>[2] Novel food with sugar added</p> <p>[3] Novel food with salt added</p> <p>Outcome measure: Liking</p> <p>No of exposures: 2-15 (twice weekly over 9 wks)</p> <p>Long term follow up: None</p>	<p>39 children aged 3-5 years (American)</p>	<ul style="list-style-type: none"> • Exposure increases liking in pre-school children • 8-15 exposures required to see an effect • Liking for other flavoured versions of the same food decreases • Liking <i>does not</i> generalise to other foods similarly flavoured, i.e. there is no evidence in support of a 'sweet' or 'salty' tooth (see below *)

STUDY	EXPERIMENTAL CONDITIONS	PARTICIPANTS	KEY FINDINGS
(Sullivan & Birch, 1994)	<p>During pre- and post- exposure periods, consumption measured of salted and unsalted target food and one control food. 4 exposure groups:</p> <ul style="list-style-type: none"> [1] Salted peas [2] Unsalted peas [3] Salted beans [4] Unsalted beans <p>Outcome measure: Consumption Target food presented 10 times during exposure period Exposure frequency: 1 per day over 10 days Long term follow up: None</p>	<p>36 infants aged 4-6 months (American)</p>	<ul style="list-style-type: none"> • Exposure increases consumption in infants • In infants, increased consumption <i>does</i> generalise to other foods similarly flavoured (see above *)
(Birch, et al., 1998)	<p>During pre- and post- exposure periods, consumption measured of :</p> <ul style="list-style-type: none"> - <i>target</i> novel food - <i>same</i> food (different manufacturer) - <i>similar</i> food from same food group - <i>different</i> food from another food group <p>Target food presented 10 times during exposure period Exposure frequency: 1 per day over 10 days Outcome measure: Consumption Long term follow up: None</p>	<p>39 infants aged 4-7 months (American)</p>	<ul style="list-style-type: none"> • Taste exposures increase consumption in infants • Effects begin after 1 exposure • Effects transfer to similar foods • Effects do not transfer to foods other food groups

From the methodological standpoint, all the studies adopted an experimental design and included infant and child participants up to 5 years of age. Thus, the evidence establishes a causal relationship between exposure and eating behaviour in the population at the lower end of the age range of interest to this study. However, all the studies, by definition, exposed the children to the target foods during the pre- and post- experimental measurements which impacts upon the evidence relating to the number of exposures required to induce an effect. For example Birch et al. (1998) found that exposure effects were beginning to appear after the first pre-experimental session. Furthermore, any study into feeding strategies inherently incorporates exposure in its design alongside the target strategy. For example, in the study conducted by Hendy (2002) into peer modelling, RTE would have been in operation within the control group and the two study groups making it unclear which strategy is at work. On the other hand, it also suggests that RTE may be a naturally occurring phenomenon that could be sustainably harnessed in settings such as schools. For example, current school meal transformation programmes aim to improve the nutritional standards of the food provided (C. E. L. Evans & Harper, 2009) thereby putting in place the mechanism whereby the causal relationship between exposure and eating behaviour is triggered. Further research would be needed to establish how RTE functions in the interfaces between the child and wider contexts, such as schools.

3.2.4 The influence of restrictive feeding practices on eating behaviour

Eating behaviour is contingent upon the food that is available (Rozin, 1989). Children are generally *exposed* to foods made available by others. Conversely, children may be purposefully *denied* access to foods. Such restrictive feeding practices have only been investigated experimentally in one study. Fisher & Birch (1999b) found that 3-5 year old children's consumption, selection of and behavioural responses to the restricted food (e.g. clapping when it appeared) increased *during the period of availability*, compared to a similar, freely available food. These behaviours did not persist once the food became freely available again. However, a number of methodological issues arguably question the findings. Firstly, the restricted and free access foods were similar (fruity bars), possibly too similar to produce an effect that persisted beyond the experimental period. Secondly, 'restriction' was simulated by only making the target food available for a few minutes half-way through a 15-20 minute session, which is

arguably not a natural simulation of restrictive practices in the home. Beyond this, much of what is known about restrictive feeding practices has been derived from correlational studies.

Rather than simulating restriction, the correlational studies summarised in Table 10 assessed the extent to which restriction was used by parents and then examined its relationship to other variables, such as consumption. An initial investigation undertaken by Fisher & Birch (1999a) showed that restrictive maternal feeding practices were predictive of higher intake of a freely available snack food, but only in 3-5 year old girls. The nature of this mother/daughter relationship is suggested as bi-directional since the daughter's weight status may elicit the restrictive practices rather than vice versa (Birch & Fisher, 2000) emphasising the potential complexity of such inter-personal relationships. A longitudinal study using a cohort of girls, showed that increased consumption associated with mothers' use of restrictive practices was a stable behaviour between the ages of 5 years (J. O. Fisher & Birch, 2000); 7 years (J. O. Fisher & Birch, 2002); and 9 years (Birch, Fisher, & Davison, 2003).

Methodologically, most of the studies adopted a correlational design so there is a paucity of cause and effect evidence with respect to restrictive strategies - although it must be emphasised that restriction would be difficult to simulate experimentally both practically and ethically. The samples used in these correlational studies were larger than those in the experimental studies into any of the feeding strategies identified within the literature. The cohort used in the longitudinal studies comprised of 197 girls (primarily white, non-hispanic) and their families involved in a study into the development of eating behaviours across middle childhood (Birch & Fisher, 2000; Birch, et al., 2003; J. O. Fisher, Mitchell, Smiciklas-Wright, & Birch, 2002; Francis & Birch, 2005). Although this longitudinal design demonstrated a long-term association between restriction and consumption, the strength of the knowledge base is compromised by its reliance on this single cohort of limited diversity with respect to age, ethnicity and SES. However, a similar relationship between restriction and self-reported snack intake has been found in older children (9-13 years), including boys (R. Brown & Ogden, 2004). Seth et al. (2007) have suggested ethnicity

Table 10 Studies showing associations between restrictive feeding practices and eating behaviour

STUDY	DESIGN	PARTICIPANTS	KEY FINDINGS
(J. O. Fisher & Birch, 1999a)	<ul style="list-style-type: none"> • Parent's restriction of 10 snack foods assessed via questionnaire • Child's perception of maternal restriction assessed by interview • Same foods made available during a play session to children self-assessed as not hungry - known as the 'free access procedure' <p>Relationships studied: Consumption (EAH)¹ Maternal restrictive practices Child's perception of maternal restriction</p>	71 children, aged 3-5 years and their parents. Mainly Caucasian. (American)	<ul style="list-style-type: none"> • Restrictive feeding practices were predictive of higher consumption, but only in girls
(Birch & Fisher, 2000) ²	<ul style="list-style-type: none"> • Mother's restrictive practices; dietary restraint and perception of child's weight status assessed via questionnaires • Free access procedure as above <p>Relationships studied: Consumption (EAH)¹ Maternal restrictive practices Maternal restraint Maternal perception of child's risk of overweight</p>	197 girls aged 5 years and their mothers. White, non-Hispanic (American)	<ul style="list-style-type: none"> • Daughter's weight predicted mother's use of restrictive practices • Restrictive feeding practices predict higher consumption in girls
(J. O. Fisher & Birch, 2000) ²	<ul style="list-style-type: none"> • Mother's restrictive practices • Child's perception of maternal restriction and negative feelings about eating assessed by interview • Free access procedure as above <p>Relationships studied: Consumption (EAH)¹ Maternal restrictive practices Daughter's negative feelings about eating</p>	As above	Restrictive feeding practices: <ul style="list-style-type: none"> • predict higher consumption in girls • generate negative feelings about eating restricted food
(J. O. Fisher & Birch, 2002) ²	<ul style="list-style-type: none"> • Mother's restrictive practices • Child's weight • Free access procedure as above <p>Relationships studied: Consumption (EAH)¹ Maternal restrictive practices Daughter's weight</p>	As above, 192 girls, now aged 7	<ul style="list-style-type: none"> • EAH is a stable behaviour between 5-7 years of age

STUDY	DESIGN	PARTICIPANTS	KEY FINDINGS
(Birch, et al., 2003) ²	As above	As above, 184 girls, now aged 9	<ul style="list-style-type: none"> • EAH is a stable behaviour between 5-9 years of age
(Francis & Birch, 2005) ²	As above but the sample is split based on the mother's weight status (91 overweight, 80 normal weight)	As above	<ul style="list-style-type: none"> • Restrictive feeding practices have more adverse effects when the mother is overweight

NOTES:

¹ A specific variant of consumption was used known as eating in the absence of hunger (EAH);

² These studies were carried out on a single cohort

may not be a determining factor in parental feeding practices which may be more influenced by the level of acculturation of non-native parents i.e. the degree to which they forsake the behaviours of their native country in favour of the host country. The same may not be true of SES which may influence the use of practices such as restriction in low-income families if food prices are an issue (A. L. May et al., 2007).

In summary, relationships exist between restrictive food practices and increased consumption of restricted (undesirable) foods in children. Although it is known that parents employ such practices in the home (S. N. Moore, Tapper, & Murphy, 2007) little is known about their use, or effects, in other settings such as school dining halls. School meal transformation programmes in the UK are currently in the process of revising the nutritional standards for school meals (C. E. L. Evans & Harper, 2009). Furthermore, England's 'Turning the Tables' programme advocates 'choice control' whereby food availability is manipulated to promote healthy options but restrict unhealthy ones (School Meals Review Panel, 2005). Although this is seen as a means of introducing and reinforcing habits that would promote child health, associations between restriction and increased consumption of restricted foods suggests that choice control may have unintended consequences. Further research would be needed to establish if (or how), food restriction is practiced in schools and whether (or how) it is perceived by the children.

3.2.5 The influence of pressuring feeding strategies on eating behaviour

Even low levels of pressure (i.e. mild requests to finish your food) have been shown to have a negative effect on consumption (Galloway, Fiorito, Francis, & Birch, 2006). Two groups of 3-5 year old children were exposed to unfamiliar flavours of a soup for eleven weeks. One group was subjected to mild pressure to eat, the other received no such pressure. During a post-experiment assessment, although intake of the soup increased in both groups, the extent of the increase was significantly less in the group that had been pressured to eat. Furthermore, this group made more negative comments about the pressure/food than the control group suggesting that pressure induces negative affect as well as reduced intake. This study also incorporated a correlational investigation which showed that the children who ate less overall were those whose

parents reported applying pressure to eat at home. Indeed, most of the literature on pressuring children to eat is based on correlational studies.

Applying pressure to eat has been shown to be negatively associated with F/V intake in 5 year old girls (J. O. Fisher, et al., 2002). Furthermore, pressurising 7 year old girls to eat was found to be predictive of lower F/V intake at age 9 (Galloway, Fiorito, Lee, & Birch, 2005). Both studies used the same cohort as each other, and as the studies into restriction shown in Table 10. They were also able to show that the parents' own F/V intake was more predictive of their daughter's intake and less predictive of their use of pressure, suggesting that modelling strategies are more effective than pressuring strategies. This negative association between F/V intake and pressure to eat was both replicated and extended to boys by Wardle, Carnell and Cooke (2005).

A retrospective study of pressuring children to eat focussed on 19 year old college students who were asked to recall situations when they were forced to consume something against their will (Batsell Jnr, et al., 2002). Such 'forced consumption' episodes were recalled by 69% of the students and on 75% of occasions involved an adult authority figure. The effects of such episodes were long lasting with 72% of the respondents reporting that aversions to the foods concerned remained. The types of force reported involved threats, punishments and inducing guilt. Of note, some of the feeding strategies described found in the literature were perceived as 'force', for example, adults modelling consumption with verbal encouragements, suggesting that children may perceive strategies differently to adults.

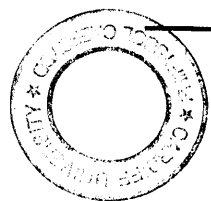
As with restrictive feeding practices, much of the knowledge base has been derived from correlational studies rather than experimental studies. Furthermore, studies by Birch and colleagues relied upon a convenience sample of girls attending day care programmes at the Pennsylvania State University Child Development laboratory (Fisher et al., 2002; Galloway et al., 2006; Galloway et al., 2005). Although the ages of the children (5-9 years) align with the primary school age-group, little is known about the use (or effects) of pressuring feeding strategies in schools.

A specific type of pressuring strategy is the use of rewards to coerce children to do something they might otherwise not choose to do. Food can be used in a number of ways in these coercive reward scenarios. It can be used instrumentally such that eating is instrumental in obtaining a reward – this is known as ‘instrumental eating’ (Birch, Birch, Marlin, & Kramer, 1982). For example, going out to play may be contingent upon eating a food, in which case, food only features in the instrumental part of the scenario. Alternately, eating a vegetable may be required in order to get dessert. In these ‘food-food reward scenarios’, both the reward and the instrumental act are foods, i.e. food acts as both the means and the end in the scenario. Finally, food may only feature in the scenario as the reward, i.e., receiving the food is contingent upon another non-food related act. This act is the means by which the end (the food) is earned.

Studies into the effects of rewards used in coercive scenarios (see Table 11) have shown that using food as a reward for good behaviour increases liking for that food (Birch, et al., 1980). As snack foods are often used as ‘currency’ in the interactions between parent and child (R. Brown & Ogden, 2004) and, culturally, it is sweet or nutritionally undesirable foods that are used in this way (Birch, et al., 1980), the implications are that parents may be unintentionally increasing their child’s liking for unhealthy foods. Making a non-food reward contingent upon consumption, meanwhile, decreases liking for the food concerned (Birch, et al., 1982; Birch, et al., 1984). When food is used as both the reward and the contingency, a divergence in liking occurs such that the reward food is liked more (Mikula, 1989), although this phenomenon is not effective to increase liking for disliked foods used as rewards. Newman and Taylor (1992) also showed that the decrease in liking for a food eaten contingently was not observed when a temporal order was specified rather than an offer of a reward i.e. where the children were asked to ‘eat *food A* then *food B*’ rather than told ‘if you eat *food A* you can have *food B*’. They suggest that it may be possible for carers to establish priorities for food consumption (e.g. vegetables before dessert) without overtly emphasising the presence of a contingency. The strength of the studies summarised in Table 11 is the consistency with which they have shown that using food as a reward makes it more desirable, but using it as a contingency makes it less desirable.

Table 11 Studies into the effects of rewards used in coercive scenarios on eating behaviour

STUDY	EXPERIMENTAL CONDITIONS	PARTICIPANTS	KEY FINDINGS
Food as a reward (Birch, et al., 1980)	[1] Reward is a food neither strongly liked/disliked. Child rewarded whenever good behaviour was observed. [2] Food freely available in child's locker [3] Food presented as a snack (control) Outcome measure: Liking Exposure: 42 (21 x 2/day over 6 wks) Long term follow up: 6 weeks	64 children aged 3-5 years (American)	<ul style="list-style-type: none"> • Presenting food as a reward increases liking for that food • Effects present 6 weeks • Implications are that such foods may not be 'desirable' in real-life conditions e.g. sweets
Food used instrumentally ¹ (Birch, et al., 1982)	Contingency: play activity neither strongly liked/disliked Reward: drink neither strongly liked/disliked Reward condition: "Drink this juice and you can play". Other play activities are available. Outcome measure: Liking Exposure: 6 over 3 weeks Long term follow up: None	12 children aged 3-4 years (American)	<ul style="list-style-type: none"> • Where consumption of a food is required for permission to engage in another activity, liking for that food decreases
Food used instrumentally ¹ (Birch, et al., 1984)	Contingency: Movie ticket Reward: Drink neither strongly liked/disliked. Reward conditions: [1] Drink <i>some</i> juice to get a movie ticket [2] Drink <i>some more</i> juice to get a movie ticket [3] Control groups (2), snack then movie or movie then snack presented unconditionally Outcome measure: Liking Exposure: 8 (4 x 2/week over 4 weeks) Long term follow up: None	45 children aged 3-5 years (American)	<ul style="list-style-type: none"> • Where consumption of a food is required for permission to engage in another activity, liking for that food decreases (as above) • Effect NOT dependant on requiring the child to drink more than they want to



STUDY	EXPERIMENTAL CONDITIONS	PARTICIPANTS	KEY FINDINGS
Food-food reward scenarios ² (Mikula, 1989)	[1] "If you eat <i>food A</i> , you can have <i>food B</i> ". Foods are neither strongly liked/disliked. 3 exposures. Control – both foods presented [2] "If you eat <i>food A</i> , you can have <i>food B</i> ". Food A is neither strongly liked/disliked. B is disliked. 3 exposures. Control – both foods presented [3] As [1] but only 1 exposure after which children asked to choose between the two Outcome measure: Liking, choice Exposure frequency: 2-4 days apart Long term follow up: 5-6 weeks	[1] 42 children aged 4-7 years [2] 50 children aged 3-6 years [3] 56 children aged 3-6 years (American)	<ul style="list-style-type: none"> • When food A,B are neither strongly liked or disliked, liking for <i>food B</i> increases and persists for at least 6 weeks but liking for <i>food A</i> is impaired but only temporarily • Using disliked foods as rewards does not work as a technique to increase liking for them • Divergence in liking choice occurs after a single exposure
Food-food reward scenarios ² (Newman & Taylor, 1992)	Foods neither strongly/like disliked [1] If you eat <i>food A</i> , you can have <i>food B</i> [2] Eat <i>food A</i> then <i>food B</i> [3] Both foods made available (control) Outcome measure: Liking Exposure: 1 Long term follow up: None	86 children aged 4-6 years, mostly white, middle class (American)	<ul style="list-style-type: none"> • When two foods are presented together, divergence in liking ONLY occurs in a reward scenario

NOTES:

¹ Eating is required in order to receive the reward.

² Food used as a reward for eating i.e 'If you eat *food A*, you can have *food B*'

General limitations of the literature base relating to pressuring feeding strategies are that the age group studied has mostly been pre-school children, and that many of the participants have been children attending day-care programmes at the Pennsylvania State University Child Development laboratory with limited ethnic and socio-economic diversity. Furthermore, whereas it is known that pressure to eat, including the coercive use of rewards, is employed by parents in the home (S. N. Moore, et al., 2007), there are no studies which have investigated whether, or how, the inter-relationships between staff and children in the school dining hall context involve pressure to eat. Given the emphasis that policy places on 'marketing' school food (see School Food Trust, 2009a), further research is recommended to ensure that current dining hall practices avoid the risks identified within the literature relating to pressuring feeding strategies.

Rewards also feature prominently in another category of feeding strategies which involve encouraging the child to eat in social contexts that are positive as opposed to coercive.

3.2.6 The influence of encouraging feeding practices on eating behaviour

Birch et al. (1984) conducted a study where one of the experimental conditions was a coercive reward scenario wherein the consumption of a drink was the means by which 3-5 year old children could earn a movie ticket. This study included two further experimental conditions wherein the rewards were used as indicators of achievement in that the children were praised verbally after; a) emptying their cup or b) drinking more from a cup that had been drunk and then refilled. As had been found with the movie ticket scenario, the study found that liking for these drinks decreased. On the other hand, verbal praise and rewards in the form of stickers were found to be effective in encouraging 3-6 year old children to consume healthy, rather than unhealthy, snacks (Stark, et al., 1986). However, the results were not sustained and it was acknowledged that ongoing reinforcement may be needed. At the end of the 1980s, therefore, the evidence relating to the use of rewards was inconclusive. Consequently, Horne and colleagues set out to investigate the effectiveness of coupling rewards with videos of cartoon characters modelling food consumption (Horne, et al., 1995). The rewards included t-shirts, caps, and stickers that were

collected to earn a place on a forthcoming outing. Findings showed that the use of peer modelling and rewards increased consumption, although the study was not able to assess the relative contributions of the two feeding strategies. A later study concluded that the combined effects of rewards and peer modelling were more effective than either strategy in isolation (Lowe, et al., 1998). These studies established the importance of the symbolic context of the reward, i.e. as a positive experience that establishes eating as a high-value activity. Current advisory guidelines published in support of the school food transformation guidelines recommends that rewards are used to establish rules and targets with respect to healthy eating behaviour (School Food Trust, 2009b). Given the subtleties identified within the literature regarding whether or not rewards in the food domain produce positive or negative outcomes, questions remain as to whether policy in its current form will foster positive relationships between rewards and eating behaviour.

It is clear from the literature, therefore, that relationships exist between the inter- and intra-personal levels in the form of feeding strategies that influence eating behaviour. A number of interventions have used the associated theory to inform their methodological design with respect to the behavioural change mechanisms employed.

3.2.7 Interventions based on feeding strategy theory

Interventions that have used feeding strategy theory as their theoretical basis fall into three categories – interventions used clinically with children with severe feeding problems; home-based interventions; and, school-based interventions. Behavioural interventions are often used for children with chronic feeding problems, such as extreme selectivity or food refusal, provided there is no physical impediment to feeding (e.g. an inability to swallow or chew). Peer modelling (Greer, Dorow, Williams, McCorkle, & Asnes, 1991), verbal praise, and tangible rewards such as foods that are liked, playing with toys or watching television (Bernal, 1972; Riordan, Iwata, Finney, Wohl, & Stanley, 1984; Williams, Paul, Pizzo, & Riegel, 2008) have all been found to effective in producing sustainable increases in consumption in such children (see Table 12). Although not all of these studies referenced the feeding strategy literature base, indeed some of them pre-date it, the techniques used align

Table 12 Interventions using feeding strategy theory to influence children's eating behaviour

STUDY	INTERVENTION DESIGN	PARTICIPANTS	KEY FINDINGS
Behavioural treatment – home setting (Bernal, 1972)	In consultation with a clinician, mother trained to introduce the following over 32 weeks : <ul style="list-style-type: none"> • Give social attention whenever child swallowed but at no other time during meal • Make a preferred food available whenever the child ate a non-preferred food • Allow TV viewing when novel food was eaten Outcome measure: Consumption	4 year old girl with a protracted history of refusal to feed	<ul style="list-style-type: none"> • Child's eating behaviour was shaped gradually through a series of reinforcement sessions
Behavioural treatment – medical setting (Riordan, et al., 1984)	Verbal praise and spoonfuls of non-preferred food or access to a toy to play with delivered for each spoonful of preferred food. Parent trained in procedures after hospital discharge Outcome measure: Consumption Exposure: 40-80 feeding sessions Long term follow up: 7-30 months	4 handicapped children aged 16-40 months children with no feeding skills	<ul style="list-style-type: none"> • Consumption increased and independent feeding established
Behavioural treatment – home / preschool setting (Greer, et al., 1991)	Peer (sibling or school friend) is rewarded verbally or with a token for eating Outcome measure: Consumption Exposure: 18, 50 feeding sessions Long term follow up: 1 month (Child 1)	2 children aged 18 and 29 months refusing to feed	<ul style="list-style-type: none"> • Peer mediation is successful in increasing consumption in children with severe feeding problems not attributable to physical problems
Behavioural treatment – medical setting (Williams, et al., 2008)	Verbal praise or access to play granted for taking a bite of a novel food. Once food was 'mastered' (willingly/quickly eaten), another novel food was introduced to the diet Outcome measure: Consumption Exposure: 1-35 presentations per food	5 children aged 3-11 years with extreme food selectivity and/or refusal., 3 of whom were autistic. (United States)	<ul style="list-style-type: none"> • Confirmed past research suggesting that 10-15+ exposures may be needed to introduce novel foods • Number of exposures decreases as more foods are added to the diet

<p>School based RCT (Wardle, Herrera, Cooke, & Gibson, 2003)</p>	<p>3 groups: [1] Exposure – food offered [2] Reward – food and a reward sticker offered [3] Control – no intervention Outcome measure: Consumption, Liking Exposure Frequency: 1 per day over 8 days Long term follow up: None</p>	<p>49 children aged 5-7 years from 3 primary schools (England)</p>	<ul style="list-style-type: none"> • Taste exposure increases consumption and liking • Rewards produce a rapid increase in consumption but a slow increase in liking • Rewards may inhibit the effectiveness of exposure • Consumption increased in control group (after 1 exposure)
<p>Parent-led, home based RCT (Wardle et al., 2003)</p>	<p>3 groups: [1] Exposure [2] Nutritional advice [3] Control Outcome measure: Consumption, Liking Exposure Frequency: 1 per day over 14 days Long term follow up: 6 weeks (interview)</p>	<p>156 parents of 2-6 year old children. Mainly while Caucasian (England)</p>	<ul style="list-style-type: none"> • Taste exposure increases consumption and liking in home setting • Duration difficult for parents to sustain
<p>School based (Food Dudes) (Lowe, et al., 2004)</p>	<p>Modelling via Food Dudes video, Food Dudes rewards, encouraging Food Dudes letters, home information packs, F/V available Outcome measure: Consumption, Liking Duration: 16 days Long term follow up: None</p>	<p>402 children aged 4-11 years from 3 schools. Mainly Caucasian, high or low social deprivation (England and Wales)</p>	<ul style="list-style-type: none"> • Peer modelling and rewards based intervention capable of increasing F/V consumption and liking
<p>School based RCT (Food Dudes) (Horne, et al., 2004)</p>	<p>[1] Experimental school – Modelling via Food Dudes video, Food Dudes rewards, encouraging Food Dudes letters, home information packs, F/V available [2] Control school – F/V available Outcome measure: Consumption Duration: 16 days Long term follow up: 4 months</p>	<p>749 children aged 5-11 years from 2 schools. Mixed ethnicity, high social deprivation (England)</p>	<ul style="list-style-type: none"> • Food Dudes intervention successful in increasing F/V consumption • Effects present at 4 month follow-up (although weaker)

<p>School meal service (M. B. Schwartz, 2007)</p>	<p>[1] Experimental school – verbal prompt ('Would you like fruit or juice?')</p> <p>[2] Control school – fruit and juice available but no verbal prompt</p> <p>Outcome measure: Choice, Consumption</p> <p>Duration: 3 months</p> <p>Long term follow up: None</p>	<p>2 primary schools, mainly Caucasian, low FSM eligibility, high academic achievement</p> <p>(United States)</p>	<ul style="list-style-type: none"> • Verbal prompts delivered by food service staff significantly increase likelihood of children choosing and eating food
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exactly. These interventions illustrated that feeding strategies used outside the experimental setting could establish independent feeding behaviours and prevent short-term health problems. They were, however, intensive one-to-one clinical treatments rather than larger scale, settings based interventions.

Wardle, Herrera et al. (2003) conducted a study in a school setting underpinned by the theories relating to rewards, exposure and food neophobia. The intervention was found to increase consumption of, and liking for a novel or comparatively disliked vegetable (red pepper). However, the authors noted that exposure is a feature of all feeding scenarios; indeed, even their experimental control groups received two exposures to the target foods. They also suggested that the rewards used may have limited the effects of exposure alone. These findings laid the foundation for Wardle, Cooke et al.'s trial of parent-led exposure in the home (2003). Although successful in increasing consumption of a disliked vegetable, 28% of the participants failed to achieve the target of ten taste exposures, and 70% of the parents later interviewed said they found ten exposures hard to achieve which raised questions as to whether exposure based interventions in the home were impractical. In the school setting, no studies have investigated the effectiveness of RTE. However, a later longitudinal study in a clinical sample of 6 children aged 3.5-11 years with feeding difficulties showed that the required number of exposures decreased over time as more foods were introduced into the food repertoire (Williams, et al., 2008).

The Food Dudes intervention was based on studies conducted by Horne and colleagues at the University of Wales, Bangor (Horne, et al., 1995; Lowe, et al., 1998). The studies established the importance of the symbolic context of rewards in the food domain, i.e. as a positive experience that establishes eating as a high-value activity. They also established that modelling and rewards were more effective in combination than in isolation. The Food Dudes intervention was evaluated via two studies using larger samples of several hundred pupils aged 4-11 years of mixed ethnicity and social status (Horne et al., 2004; Lowe et al., 2004). The increases in consumption that were achieved remained at a four month follow up, albeit reduced in strength. Another school-based study conducted in an elementary school dining hall in the United States concluded that children were more likely to select fruit when the

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server delivered a verbal prompt ('Would you like?') than when the server remained silent (M. B. Schwartz, 2007). The children were also found to consume the fruit they had selected rather than waste it.

In summary, from a SE perspective, eating behaviours and their modification via social interactions are conceptually located at the intra- and inter-personal levels. Behaviours such as consumption, choice and liking are learned in early childhood through the child's experiences with foods involving learning mechanisms such as social learning, classical and operant conditioning. Feeding strategies involving modelling, RTE, pressure to eat, food restriction and encouragement have been shown to influence children's eating behaviours, particularly up to 7 years of age. The literature, as well as published reviews of it (e.g., D. Benton, 2004; Savage, Fisher, & Birch, 2007), gives the impression that these feeding strategies primarily fall within the remit of parents in the home. Even though comparatively few studies have been school based, there is no evidence that the psychosocial interactions inherent in the strategies are context dependant either with respect to who might utilise them or how effective they might be. The current school meal transformation programmes make reference to the importance of the role of catering staff and lunchtime supervisors emphasising the need for appropriate training (School Meals Review Panel, 2005; Scottish Executive, 2002; Welsh Assembly Government, 2008a). However, training generally relates to cooking skills and healthy eating rather than behavioural modification techniques, and most commonly applies to catering staff rather than lunchtime supervisors. To examine the extent to which current policy initiatives trigger those inter-personal process that have been reliably shown to positively influence eating behaviour, further research would be needed to establish whether and/or how feeding strategies are used by staff in the school meal dining hall.

A bottom-up analysis of the SE processes associated with nutritional behaviour also reveals influences at the organisational level.

3.3 Organisational processes associated with eating behaviour

The top-down analysis of the SE processes associated with nutritional policy showed how processes within and between organisations associated with school meal delivery influence such policies. It is also clear from the literature that other processes associated with the organisational level (specifically a phenomenon known as ecologies of practice as well as the attributes of the context itself) influence nutritional *behaviour*, the modification of which features so prominently in such policy.

3.3.1 Ecologies of practice and their influence on eating behaviour

Settings based health promotion recognises that *contexts* influence individual behaviour. To this end, the school meal service is an integral part of the HPS (Health Education Board for Scotland, et al., 1996) which has the potential to make available approximately one-third of a child's daily intake during term-time (Gregory, 2000) during the stage in a child's life when their eating behaviour is most malleable (Kelder, et al., 1994) (in the case of primary schools). School meals in the UK are currently the subject of national policies whose aim is to transform the service, particularly the nutritional content of the meals themselves (C. E. L. Evans & Harper, 2009). However, early findings are that children may be reluctant to consume the healthier foods on offer (Gatenby, 2007) suggesting that current SE pathways from policy, via the school to the child, although necessary, may not be sufficient to have the desired effect on dietary behaviour.

SE health improvement approaches recognise the influence of individuals and groups acting at various levels (Stokols, 1992). It follows that individuals and groups who may not be the ultimate target of a policy may be involved in its implementation. The multi-layered processes whereby individual experiences and beliefs influence local policies and/or practices are referred to as 'ecologies of practice' (Stronach, Corbin, McNamara, Stark, & Warne, 2002). Once policy and delivery are uncoupled, tensions may exist between management groups and individuals regarding the details of the resultant working practices (Backett-Milburn & Wilson, 2000). For example, performance targets may not reflect the practical complexity of effecting change within communities or individuals (P. Fisher & Owen, 2008). Furthermore, ecologies of practice also involve a commitment to ideologies or adaptations of best practice

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which can lead to a preferred style of working, or judgements of how best to engage with particular individuals or contexts that may be at odds with policy (Stronach, et al., 2002). For example, teachers may become familiar with class groups and individual pupils and tailor the pace and style of their teaching accordingly.

Ecologies of practice suggest that the behaviour of individuals within organisations associated with the school meal service may be as critical to the success of the school meal policy as factors such as school meal uptake or the cost of food provision. In the case of school meal staff, this is over and above their influence within the social eating context which has been shown to contribute to the development of food associations (Birch, 1998). For example, mild levels of coercion can lead to reduced consumption of the food concerned (Galloway, et al., 2006) whereas food presented in a supportive context can increase liking for that food (Birch, et al., 1980). However, no research has been undertaken to understand how the practices of individuals engaged in the delivery of school food policies impacts on either policy implementation or the eating behaviour of the children themselves.

A further category of organisational influences on nutritional behaviour identified within the literature relate to the characteristics of the environment itself.

3.3.2 Environmental influences on eating behaviour

SE theory acknowledges that physical attributes, such as noise, space or lighting, contribute to the complexity of a context (Stokols, 1992) suggesting that these attributes may variously detract from, or contribute to the effectiveness of health improvement programmes. In a seminal text on observational research, Spradley defines a framework which suggests that any environment can be understood in terms of its physical (places, objects), temporal (time periods, events) and social (actors, activities, goals, feelings) dimensions (Spradley, 1980). With respect to the physical dimensions of the school eating environment, the UK's school meal transformation programmes recognise the importance of appropriate kitchen facilities, dining spaces and equipment as well as the nutritional content of the food (School Meals Review Panel, 2005; Scottish Executive, 2002; Welsh Assembly Government, 2008a). In comparison, these are often secondary objectives within strategic school rebuilding

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programmes, particularly in primary schools (Department for Education and Skills, 2006; Scottish Executive, 2003; Welsh Assembly Government, 2002) which also have to address issues such as mapping changing populations onto educational provision using long-term demographic projections. In England during 2005-6, 72% of schools could prepare food, 5% could regenerate previously cooked foods and 20% could do neither (Nelson & Nicholas, 2006). By 2007-8, 73.8% of schools had preparation facilities, 6.2% had regeneration facilities, and amongst the remainder, 17% transported meals in from elsewhere (Nicholas, et al., 2008). In Wales, a full audit of kitchen and dining facilities forms a part of the ongoing A4L programme (Welsh Assembly Government, 2008a). However, school inspection reports from the 2005-7 period showed that around 20% of schools inspected had no on-site cooking facilities (Estyn, 2008). The delay in transporting food from the site where it is cooked was reported as making the food less appealing to children.

The physical eating environment includes numerous non-food related stimuli such as temperature, lighting and colour that are known to influence eating behaviours (Stroebele & De Castro, 2004). However, many of the environmental characteristics of school dining halls are intended to improve management issues, such as maximising throughput (School Food Trust, 2009b), rather than eating behaviours. Dining halls often include regimented tables and minimal open spaces which detract from the social eating experience (Pike, 2008). In England, 57% of LEAs felt that improvements to dining facilities in primary schools were essential to maintain, or increase, uptake levels (Nicholas, et al., 2008). Similarly, school inspections in Wales have revealed that children are more likely to opt to take schools meals when: the dining room is attractive, warm and clean, rather than overcrowded and noisy; food is served on traditional plates rather than all-in-one trays; and, when small tables and chairs are used rather than long tables with integral seats (Estyn, 2008). Although there is emerging evidence that improvements to the physical dining environment coupled with revised, nutritional balanced menus improve children's learning behaviours in the classroom (School Food Trust, 2009c), research has overlooked the influence of the physical environment on eating behaviour.

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One temporal characteristic that impinges upon the school meal eating environment is the length of the lunchtime (School Food Trust, 2007). During this time, the children need to: collect their food, which possibly involves time spent queuing; eat and digest this food; and, re-charge their concentration levels prior to afternoon teaching sessions, typically by engaging in playtime. In the late 1990s, although the length of lunchtime varied between schools, most infants (ages 4-6 years) had more than 65 minutes for lunch (including playtime) and most juniors (ages 7-11 years) had more than 60 minutes (Blatchford & Sumpner, 1998). The tendency at this time was to reduce the lunchtime due to concerns over playground behaviour and demands on teaching time. There was no indication that reducing lunchtimes were associated with the move to compulsory competitive tendering for school meals that began in the 1980s. By 2005, lunchtimes in primary schools in England ranged from 30-105 minutes, including playtime (median = 60 minutes) (Nelson et al., 2006). The corresponding figures for Wales (2005-2007) are 65 minutes for infants and 59 minutes for juniors (Estyn, 2008). By way of comparison, children in France are allocated 2 hours for lunch (Madison, 2007) and US children, take between 13-35 minutes, excluding playtime (Conklin & Lambert, 2001).

A preliminary study conducted on kindergarten and elementary school children in the United States (ages 5-10 years) suggested that the limited time available for school lunch may dissuade children from selecting or consuming foods they perceive as difficult to eat (Swanson, Branscum, & Nakayima, 2009). This study found that children were more likely to select oranges that were sliced rather than served whole, but that this did not apply to apples where slicing did not significantly affect selection. However, it should be noted that the authors only *inferred* that time was a factor in this finding since the effects were stronger in the younger age groups who were assumed to be less dextrous than older children and, therefore, less skilled at peeling oranges quickly. The children were not asked why they did not choose oranges on the days they were served whole. Nevertheless, the study does suggest that temporal factors may have a direct influence on eating behaviour. Further research would be needed to understand how temporal factors contribute to the socio-ecological context of school dining halls in the UK.

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The literature suggests a number of social dimensions of the school eating environment that influence children's eating behaviour over and above the feeding techniques used within social interactions. These include the perceived eating experience, school climate and the social actors. In the UK, children place great importance on the school eating experience (Maxwell, 2000). However, they differentiate between the home and school eating experiences in that school is associated with allowing them more choice over what they can eat (Warren, et al., 2008). In addition, school meals in the UK have become synonymous with nutrition and its health consequences rather than being valued as a social experience (Pike, 2008), a distinction which may reflect cultural attitudes towards foods (Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999).

The school climate consists of those aspects of the social and psychological environment that distinguish one school from another (Gittelsohn et al., 2003). It is a complex construct that is dynamic and which may be perceived differently by different people. Indeed, it is defined and used inconsistently in the literature, as are the related concepts of 'ethos' and 'culture'. By way of clarification, Glover and Coleman (2005) suggest that: a) 'climate' refers to those aspects of the school context that can be measured, e.g. leadership or pupil behaviour; b) 'ethos' refers to the values that underpin school policies to influence social interactions; and c) 'culture' is the manifestation of the integrated whole of the school organisation, experience and environment. Attempts to mould school climate can be made by the establishment of codes of conduct via school policy setting (Jones, Fisher, Greene, Hertz, & Pritzl, 2007). Such policies may be construed as part of what McLaughlin (2005) describes as the 'intended' ethos of the school which may differ from the 'experienced' ethos. In addition, some elements of school climate may influence the success of programmes of change, for example, the willingness of staff to become involved or the support they receive (Gittelsohn, et al., 2003).

School meal staff are a category of social actors associated with the school dining hall. Of twenty-six UK occupations that were assessed on factors such as physical health, working conditions, time pressure, perception of role, opportunity for career development, work relationships and inclusion in decision making, school lunchtime

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supervisors were among the least stressed and most satisfied (Johnson et al., 2005). This is a positive finding since staff morale is known to be a contributory factor to the success of programmes of change (Gittelsohn, et al., 2003; Jones, et al., 2007). However, even though each of the school food transformation programmes in the UK refers to the need to train catering staff, particularly with respect to their cooking skills, references to lunchtime supervisors are minimal (School Meals Review Panel, 2005; Scottish Executive, 2002; Welsh Assembly Government, 2008a). This is a concern since research suggests that less than 40% of supervisors in primary schools in Wales are effective at encouraging children to make healthy choices or try new foods (Estyn, 2008). Training courses for midday supervisors which incorporate the encouragement of healthy eating are a comparatively new initiative (e.g., School FEAST, 2009). Although the literature suggests social factors such as the eating experience, school climate and attributes of the social actors may impinge upon eating behaviour, little research has examined whether these factors could contribute to effective school-based nutritional interventions.

The dining hall environment, therefore, potentially exhibits a range of social, physical and temporal characteristics that influence eating behaviour. However, the relationship between school meal policy and these processes operating between the organisational and intra-personal level may be deficient such that opportunities to improve eating behaviour may have been overlooked. It is also feasible that inadequate dining hall environments may be undermining policy objectives to improve eating behaviour. Further exploratory research is suggested to understand how the dining hall environment influences eating behaviour in schools.

3.4 Prospective socio-ecological influences on school nutrition

Evaluating eating behaviour from a SE perspective reveals both issues and opportunities associated with processes operating within and between higher SE levels suggesting the need for a deeper understanding of how these processes could be harnessed within nutritional policy.

At the intra-personal level, eating behaviours such as consumption, choice and liking are learned from infancy onwards through mechanisms such as social learning,

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classical conditioning and operant conditioning. These learning mechanisms can be triggered by processes operating at the inter-personal level in the form of feeding strategies employed within social eating relationships. Early indications are that relationships between these inter-personal processes and the policy level in the form of interventions based on the use of feeding strategies have the potential to achieve positive behavioural outcomes. Similar relationships and outcomes may be feasible within current school meal transformation initiatives, for example, actively encouraging children to select and consume school meals, or the modelling of school meal consumption. However, further research would be needed to explore the feasibility of utilising the social eating relationships between school based caregivers and pupils to facilitate policy objectives associated with improving nutritional behaviour.

At the organisational level, it is clear from the literature that numerous social, physical and temporal characteristics associated with eating environments influence eating behaviour. Theory suggests that characteristics of school dining halls such as the length of lunchtime, dining accommodation and school meal staff might be expected to influence children's behaviour. Thus, a SE relationship exists between the organisational and intra-personal levels. On the other hand, there is little evidence that school meal policy places sufficient emphasis on these SE processes such that there is an imperfect relationship between policy and eating behaviour at the organisational level. In addition, further SE relationships between the organisational, intra-personal and policy levels are evident in the phenomenon of ecologies of practice whereby attributes of individuals within organisations engaged in policy implementation influence its translation into practice. Evidence from other policy domains, such as education, suggests that these processes may undermine school-based nutritional policy were they to be present and not addressed. However, little is known about ecologies of practice in school dining halls. Further exploratory research is suggested to understand the inherent risks and opportunities of processes associated with the organisational level and school-based nutritional policy.

3.5 Summary

The weight of evidence with respect to links between health and dietary behaviours (Campos, Saguy, Ernsberger, Oliver, & Gaesser, 2006) together with the rising level of obesity, which is difficult to treat (Bosch, et al., 2004), are suggestive of preventive health improvement measures based upon behavioural modification. Furthermore, associations between health behaviour in childhood and health and behaviour in adulthood suggest that childhood is an important period within the lifespan to target. Explanations of health and behaviour exhibit a SE organisation which is also evident within health improvement policies, including those relating to HPSs which are specifically organised around SE principles in support of health improvement objectives. A HPS adopts a whole school approach wherein the child's learning within the classroom is complemented by their experiences in the wider school context. A number of SE frameworks have facilitated the implementation of measures to address the SE challenges inherent within health improvement policy. The framework that most comprehensively encapsulates the objectives of health improvement policy, the HPS, and the theories that underpin them is the McLeroy model which defines potential health improvement leverage or analysis points at five SE levels: a) the policy level; b) the community level; c) the organisational level; d) the inter-personal level; and, e) the intra-personal level. By evaluating previous school-based nutritional interventions against this model, a number of issues and opportunities that merit further exploratory research are suggested.

Policy initiatives that have attempted to influence children's eating behaviour have consistently been undermined by processes operating at other SE levels. For example, formal nutritional education has been shown to increase children's knowledge but not their behaviour. In addition, the school meal context has featured prominently in policy since the turn of the 20th century, and, at the turn of the 21st century, is being transformed by a number of national policies, one objective of which is to revise the nutritional standards for school meals. However, early indications are that children remain reluctant to eat the healthier meals that are served to them. In anticipation of such issues, reciprocal relationships between the policy and intra-personal levels have been put in place in the form of pupil engagement mechanisms, such as SNAGS. However, SNAGS involve structured formats, power relations and high cognitive

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demands which may be inappropriate for younger children. Whereas pre-existing school councils may be less subject to power relations, further research is needed to assess their suitability as an engagement mechanism where healthy eating is concerned. In addition, the literature demonstrates how policy implementation is enmeshed within numerous processes at the organisational level. This includes inter-organisational processes between hierarchical layers of government and also between commercial school meal providers. It also includes intra-organisational factors such as resources available and required, and less tangible attributes such as school climate and ethos. Little is known about how these organisational processes influence policy level objectives.

When school-based nutritional interventions are examined with respect to their intra-personal design attributes, a number of limitations emerge which are borne out by their disappointing results. Firstly, the identification of outcome measures has tended to be based on epidemiological data suggesting that F/V consumption falls below recommended values rather than behavioural theory. Furthermore, SCT has commonly been used as the behavioural change mechanism, even though its robustness as a framework for explaining dietary behaviour in young children has been questioned. On the other hand, a number of school-based interventions have utilised the social interactions between school meal staff and children and reported promising results. This suggests that ways of achieving synergy between policies and lower level SE processes associated with eating are an important direction for future exploratory research.

At the inter- and intra-personal levels of the McLeroy model, psychological perspectives on eating emphasise the importance of psycho-social, developmental, cognitive and psycho-physiological processes. Eating behaviours such as consumption, choice and liking are learned from infancy onwards through mechanisms such as social learning, classical conditioning and operant conditioning. Such learning mechanisms are associated with feeding strategies which are techniques invoked within social interactions that influence eating behaviour. Strategies involving modelling, RTE, restriction, pressure and encouragement are known to influence consumption, choice and liking and have been widely studied in children

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aged between 3-5 years. Such techniques may be more suited to the developmental stage of primary schoolchildren since SCT based nutritional interventions that involve planning and decision making require conscious thought processes which are underdeveloped in this age group. However, the evidence base is largely drawn from experimental or correlational studies, together with a limited number of intervention studies. As a result, little is known about the eating behaviours that school based caregivers seek to achieve, and whether and/or how feeding strategies are used in the course of social interactions in the primary school meal dining hall, or their compatibility with school nutritional policy.

A number of organisational level processes also impinge upon nutritional behaviour. Research involving practitioners within education and healthcare has revealed how ecologies of practice affect policy implementation. This is a phenomenon whereby the ideologies, attitudes and experiences of those involved in policy delivery are incorporated into actual working practices, possibly conflicting with policy objectives. However, no research has been undertaken to understand how the practices of individuals engaged in the delivery of school food policies impacts on their implementation, thence the eating behaviour of the children themselves. In addition, environments have physical, temporal and social dimensions wherein factors such as lighting, noise, space, length of lunchtime, school climate, staff skill sets and the perceived eating experience impinge upon eating behaviour. However, no in-depth research has examined the school dining hall environment to understand its role within school nutritional policy.

It is clear from the literature, therefore, that diet, health, policy and health improvement are both associated with each other and SE organised. This SE organisation suggests a number of opportunities that merit further exploratory research.

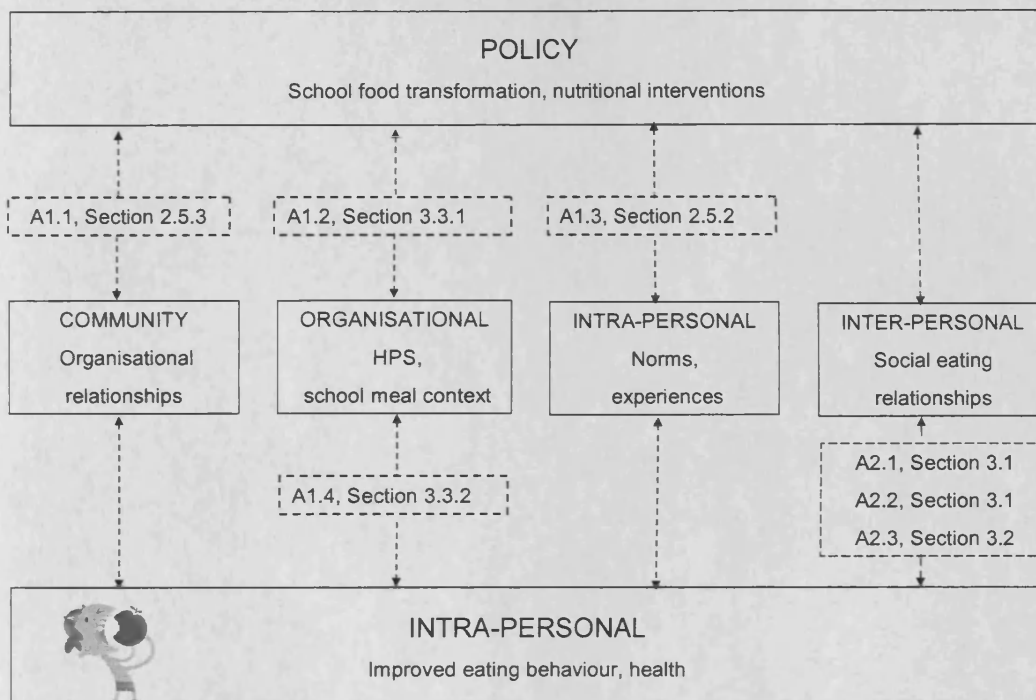
3.5.1 Research aims and objectives

The research aims and objectives are derived by superimposing the top-down SE analysis of school nutritional policy and the bottom-up analysis of children's nutritional behaviour. Figure 5 illustrates the SE organisation of the research

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objectives with respect to the ultimate goal of strengthening the relationship between nutritional policy and behavioural/health improvement. This goal is represented by the dotted arrows in Figure 5 which, were the associated SE processes more fully understood, would address the shortcomings suggested by the literature. Although Figure 5 applies to both primary and secondary schools, the research focuses on primary schools since they cover a developmental period wherein eating behaviour is more malleable, and an age group that more closely aligns with the evidence base which informs the study.

Figure 5 Socio-ecological organisation of the research aims and objectives and their relationship to school nutritional policy



Drawn with reference to (McLeroy, et al., 1988)

NOTES. Research objectives within dashed boxes are shown alongside literature review section where the associated literature is first introduced

Research aim 1 focuses on processes at the community, organisational and intra-personal levels and their relationship with nutritional policy and is:

To understand the school meal context and its implications for nutritional policy and primary schoolchildren's (age 4-11 years) eating behaviour.

Its objectives are as follows:

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- A1.1 To explore the pragmatic influences on formal or informal LEA and primary school policies which affect the food available during school mealtimes.
- A1.2 To explore the professional practices of school catering staff which influence the food made available and served at lunch time.
- A1.3 To assess the implications of using school councils for food related pupil consultation.
- A1.4 To investigate the social, physical and temporal characteristics of primary school dining halls and their implications for eating behaviours.

Research aim 2 focuses on processes at the inter-personal level and their relationship with nutritional policy and nutritional behaviour and is:

To understand the techniques used by school meal staff during social interactions within the primary school meal setting which directly or indirectly impact the children's eating behaviours.

Its objectives are as follows:

- A2.1 To identify the responses to healthy eating displayed by pupils, and perceived by the school meal staff.
- A2.2 To identify what feeding outcomes are sought by school managers and school meal staff, how these are achieved and the dynamics that upon them.
- A2.3 To identify the types of feeding strategies used by school meal staff and how they are implemented.

The terms used in the aims and objectives are operationalised as follows:

1. a 'response to healthy eating' is considered to be any behaviour or characteristic of the child that acts as a barrier to a healthy eating
2. an 'outcome' is the target of a feeding strategy whose intention is to directly or indirectly influence eating behaviour
3. a 'feeding strategy' is any technique adopted by school meal staff whose objective is to directly or indirectly modify an eating behaviour
4. an 'eating behaviour' is an action or reaction associated with the ingestion of food or drink (e.g., consumption , choice, liking)
5. an eating behaviour may be 'indirectly' modified by acting upon a factor which mediates it (e.g., food likes, values, attitudes or norms)

Chapter 4 Methodological design

4.1 Methodological paradigm

A methodological paradigm is a triad that consists of the researcher's ontological, epistemological and methodological positions (Denzin & Lincoln, 2000). The objective of the introductory section of this chapter is to present the positions assumed by this thesis as a precursor to discussing those methods which the SE framework used to inform the study suggests are appropriate to address the research questions.

Ontology is a branch of Philosophy which addresses the question 'What kinds of things really exist in the world?' (Hughes & Sharrock, 1997). The ontological position assumed by the thesis most closely aligned to 'critical realism'. The term 'critical realism' is derived from a fusion of the terms 'transcendental realism' and 'critical naturalism', both born out of the refinements of the writings of Roy Bhaskar since the 1970's (Bhaskar, 1998). Realism holds that an external reality exists which is independent of our knowledge, beliefs or understanding about that reality (Snape & Spencer, 2003) and one of its fundamental tenets is that there is a gap between the world as it is and the world as we believe it to be (Hughes & Sharrock, 1997). The 'critical' element of 'critical realism' acknowledges that the acquisition of knowledge has the potential to change unsatisfactory realities (T. Benton & Craib, 2001).

Having established a view of what there is to be known about, a related concern is to assess the effectiveness of any practices which claim to create knowledge – such concerns define a researcher's epistemological position. Epistemology addresses the question 'How is it possible, if it is, for us to gain knowledge of the world?' (Hughes & Sharrock, 1997). Two broad approaches exist – interpretivism and positivism (Snape & Spencer, 2003). The term 'positivism' was defined by Auguste Comte as the acquisition of knowledge through the rational evaluation of empirical evidence and its application to control the social world (Halfpenny, 2001). Positivism is often associated with realism since the knowledge it generates relates to an external reality which is separate from understandings of it (Flick, 2004). The positivist approach was not suited to the aims of this study since the objectives were to gain in-depth

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understanding of meaning and agency from the participants' perspectives. The mediation of the social world via meaning and human agency, as opposed to law-like regularities, is a fundamental principle of interpretivism (Snape & Spencer, 2003). Social constructionism recognises that knowledge is actively constructed such that models are continually made, tested and modified, based on experience, against a backdrop of shared understandings (Schwandt, 2000). Consequently, the epistemological position adopted reflects social constructivist principles.

The study's aims were to explore the processes and relationships within and between the SE levels associated with the school meal context and their interpretation by those within it. This emphasis on meanings and experience rather than cause-effect relationships suggests a qualitative methodology (Willig, 2001). In an early seminal debate into qualitative methods, participant observation was hailed as the most 'complete' form of sociological data, providing a 'yardstick' against which to measure the completeness of data gathered in other ways (Becker & Geer, 1970a, p133). In response, Trow (1970) rejected any idea of participant observation being the gold-standard qualitative data collection tool, stating that the problem under investigation should dictate the method. Consequently, Becker and Geer clarified their position by saying that participant observation is preferred where *events* are *observable* (1970b). However, a straightforward methodological distinction between observation and interviewing, i.e. between observing in context and in real time, or capturing decontextualised, retrospective descriptions that may contain subjective distortions oversimplifies the issue (Atkinson, Coffey, & Delamont, 2003). Social actions are both performed and talked about and the meanings they elicit should be superimposed not juxtaposed, as tends to happen if observation and interviewing are viewed as alternate methods. For example, the interpretation of a context by its participants would not be accessible by observation but could be via interview narratives constructed in terms of their socially shared frames of reference. Observation and interviewing, therefore, complement each other as qualitative methods and both methods were considered appropriate to address the research questions.

4.2 Observation

Observational techniques are recommended when the topic of interest is associated with a physical location (Lofland & Lofland, 1995). As the contextual factors that influence school meal dining halls were highly pertinent to the SE approach adopted by this study, observation was suggested as a methodological technique. Observation involves collecting data about the physical and social world directly, as it unfolds, using the senses (Foster, 1996). In so doing, the researcher may adopt one of several roles. For this study, an observation undertaken with the researcher adopting the 'observer-as-participant' role was considered appropriate (Gold, 1958), i.e., participants would be aware they were being observed by someone acting in the role of researcher. The researcher would take a 'passive' role (Spradley, 1980), participating in the scene only in the course of any discourses which they or the participants initiated. Equally as important as the role adopted by the researcher are the methods used to record the data (Pole & Lampard, 2002). To address the research objectives, the data were primarily required to explore the SE relationships and processes influencing a natural setting. To a lesser degree, some comparison or quantification was desirable based on characteristics such as school size or types of feeding strategies used. Therefore, a semi-structured observation was suggested to reflect the level of detail required by these differing objectives (Pole & Lampard, 2002). The observations needed to be focussed (Spradley, 1980), guided by the literature reviewed, and, as the study progressed by the emerging data analysis, in order to understand *all* of the SE influences upon eating behaviours in the primary school meal context. To achieve this, an observation schedule containing specific features to attend to but allowing free-format note taking would be required. On the other hand, where comparison or quantification was envisaged, more structured sections would be required in the observation schedule. The observations were complemented by interviews enhance the richness of the data and mitigate against data validity being compromised by the researcher misunderstanding what is observed and (Gold, 1958).

4.3 Interviews

An interview is a socially constructed event which produces a collection of information about particular social phenomena involving particular people in a

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particular time and place (Pole & Lampard, 2002). Interviews fall within a continuum ranging from structured to semi-structured through to unstructured (T. May, 2001). Structured interviews use a fixed question set and gather responses that can be compared, analysed and generalised and are more suited to a quantitative methodology. One of the research questions (A1.3) sought to explore the role of children within pupil consultation sessions. As unstructured interviews allow the interviewee to talk on the research subject within their own frame of reference, an unstructured approach was considered appropriate (T. May, 2001). The remaining research questions had a clearly defined focus which suggested a semi-structured interview approach (Bryman, 2001). Semi-structured interviews consist of a series of suggested discussion topics but the interviewer is free to probe by asking further questions in order to elaborate the responses (T. May, 2001)

Consideration was also given to whether the interviews should be conducted singly or in groups. This was resolved by considering who was to be interviewed and what the interview purpose was. In group interviews, each member is asked the same question in turn (T. May, 2001) whereas focus groups are a specific kind of group interview where the interviewer acts as a facilitator, using questions to prompt the participants to share their views and experiences (Cronin, 2001). Moments when a participant is not talking can be used as periods of reflection, allowing them to qualify or correct what is previously said (Lofland & Lofland, 1995). Group dynamics are a feature of this kind of approach. Problems stem from factors such as gender, age, ethnicity, personality, and status (Fern, 2001), although group dynamics can often serve to open up discussions where group interest levels are low (D. L. Morgan, 2001). During the methodological design, it was decided to adopt a group approach with school meal staff immediately after the observation. This was a practical decision since one objective of these interviews was to gather data to confirm and supplement what had been observed. A dialogue with all those involved in the scene at the same time was considered to be efficient time-wise and prudent to aid recall. However, this approach was abandoned as the study progressed in favour of individual interviews. In all other cases, one-to-one semi-structured interviews were considered to be the most appropriate since the primary objective would be to gather contextual data that was not related to the dining hall observation.

One particular element of the methodological design was purposefully given minimal consideration to avoid introducing bias. This related to research question A1.3 which aimed to assess the implications of using school councils as pupil consultation mechanisms with respect to school meals¹⁵.

4.4 Raw Data

A number of decisions were made regarding the form to be taken by the raw data. Observational fieldnotes took the form of free-format notes, diagrams of the contexts and notes written on the observation schedule. Observation notes written at the time were brief and highly codified and were elaborated into full text fieldnotes, held electronically as soon as possible afterwards (Lofland & Lofland, 1995; Pole & Lampard, 2002). Notes taken at the time are highly valuable (Spradley, 1980) and are anticipated to reduce the effects of memory loss in the face of potentially large amounts of data needing to be captured. The discipline of creating full notes from jottings can also aid the recall of events. This elaboration process was assisted by using Spradley's 'Descriptive Question Matrix' (1980, p82-83) as a checklist of pertinent aspects to record about a typical social scene (Spradley, 1980). The matrix is a two-dimensional representation of nine aspects of a social scene (space, object, act, activity, event, time, actor, goal, feeling). This prompts the observer to consider each aspect in isolation (e.g., describe all objects, all places etc) and in interaction with each other (e.g., how is the space organised by the objects?).

With the interviewees' consent, interviews were recorded as it was felt that the disadvantages of intrusiveness and transcription time were outweighed by the advantages of having a full and accurate record of the verbal component of the interview, and allowing the interviewer to fully commit to the interview conversation (Sanger, 1996).

Documentary evidence was also used where required to establish the contextual background to the study. This included the lunchtime menus, government and LEA

¹⁵ The approach adopted by each school is presented in Section 6.3.1 and discussed in Section 8.3.2

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policy documentation which were available online together with paper copies of, for example, job descriptions for school meal staff.

A reflexivity journal was maintained containing diarised entries of experiences, mistakes, confusions, problems, feelings and reactions to or from informants (Spradley, 1980).

4.5 Ethical Considerations

The research adhered to the guidelines laid down by the British Psychological Society (BPS) (British Psychological Society, 2006); the British Sociological Association (British Sociological Association, 2002); the British Educational Research Association (British Educational Research Association, 2004); and, Cardiff University School of Social Sciences (SOCSE). Ethical approval was obtained from the SOCSE ethical committee in June 2007 and Criminal Record Bureau checks were carried out with respect to the researcher. The main ethical issue was how to obtain informed consent from the children who were to be observed in the dining hall.

The BPS guidelines (2006) state that, without informed consent, observational research should be restricted to public behaviour in situations where individuals would reasonably expect to be observed by strangers. However, in law, a school is *not* considered to be a public place other than on occasions it is opened to the public for a special purpose (e.g., a school fete). The implication of this was that informed consent would be required from all participants which was anticipated to be problematic with respect to the child participants involved in the dining hall observation. The feasibility of carrying out the research without the children was rejected since the inter-personal relationships between the school meal staff and the children were critical from a SE perspective. Consequently, a non-participant observation with the researcher overtly visible was planned and a range of consent protocols were considered with respect to involving the children. The consent protocol adopted involved seeking consent from gatekeepers *in loco parentis* supplemented by parental 'opt out' consent obtained via pupil-post¹⁶.

¹⁶ Letters sent home to parents via the pupils

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Opt-out (or passive) consent involves informing both parent and child about the study and then asking parents to sign and return a consent form if they *do not* wish the child to participate (Severson & Biglan, 1989). Where the specific nature of the research precludes obtaining consent directly from the participants, approval from their duly authorised representatives is acceptable (British Psychological Society, 2006). In schools, approval from gatekeepers acting *in loco parentis* is suggested (Foster, 1996). Precedents have been set for ethical approval boards to waive the requirement to obtain signed informed consent from the parent/guardian of each schoolchild in favour of a 'passive' consent procedure (R. Brown & Ogden, 2004; Peterson Jr, Mann, Kealey, & Marek, 2000; Starkey et al., 2005). The argument in favour of passive consent is that it mitigates problems associated with reduced participant numbers and the resultant sampling bias (Severson & Biglan, 1989). For example, Brown and Ogden (2004) found that their potential sample size was reduced by 50% after seeking active parental consent from parents of 9-13 year old for a study into the effects of modelling and parental control on eating behaviours. Conversely, Carroll-Lind, Chapman, Gregory & Maxwell (2006) found that a passive consent protocol increased representativeness by achieving 93% participation. The major risk envisaged with this approach was considered to be the reliability of pupil-post as a communication mechanism. However, this was considered to be mitigated by having supplementary consent granted *in loco parentis*. In this case, the gatekeepers were the Director of Education, Head Teacher, Governing Body, Parent/Teacher Associations and any other parties requested by the Head Teacher. A number of additional issues, based on those identified by Severson and Biglan (1989), were considered in the course of defining the detail of consent protocol.

To ensure confidentiality, names of individuals, schools or the LEA would be excluded from any fieldnotes, analysis or published reports. The data were expected to be both non-personal and non-sensitive and the use of pupil-post eliminated the need to hold names and addresses of the child participants. The overall risk of harm or distress to the children was considered to be low and greatly outweighed by the potential benefits of the study with respect to improving the health of children. No assessment or testing of participants was being undertaken, and children would only be observed engaging in normal eating behaviours during the school meal break. This

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behaviour was not considered high risk, controversial or that which, in other circumstances, would not be freely carried out in a public place, e.g., a restaurant. The provision of post-hoc information to participants is typically considered to be the disclosure of any unanticipated side effects revealed by the research. In the event this applied to any of the observed behaviours, it would be made known to the appropriate authority, e.g. the headteacher.

As the study aimed to observe behaviours in a primary school dining room, other ethical and practical issues were envisaged with respect to the handling of children whose participation was withheld. The school could be excluded from the study should any parent withhold consent. However, this would have exacerbated recruitment and sampling issues and render the sample too small for a viable study. Alternately, a means could be found whereby non-participating children could consume their school lunch away from the main body of children and lunch time supervisors. However, Health and Safety implications were envisaged with alternate eating venues or supervision arrangements. In addition, this could potentially stigmatise the child and be an inconvenience for the school, the school meal provider and parents (should the alternative be for the child to eat at home). Therefore, the protocol adopted was to exclude the school from the study should a large proportion of parents withhold consent. Otherwise, school staff were asked to identify non-participating children so that the observation did not attend to them. Identifying the children by the wearing of badges was rejected due to the risk to data validity of drawing the children's attention to the fact that something unusual is occurring.

The non-sensitive personal data that was gathered during recruitment as part of the process of gaining informed consent to participate in the study was handled in accordance with the requirements of the Data Protection Act 1998 and the Freedom of Information Act 2000.

4.6 Project planning

A pilot study¹⁷ was conducted to refine the research protocol and materials based on real world experience and to rehearse the data collection in situ. A principal output of the pilot study was an analysis of the effort expended on each task, together with the elapsed time. These data were used to draw up a plan for the main study. The effort expended on the pilot study was 50.25 hours. Allowing for 10% contingency, 56 hours was allotted per school for the main study, typically spread over two weeks, if time obtaining parental consent was excluded. Therefore, the main study plan was initially constructed of a series repeating ten-working-day periods, roughly adhering to the format shown in Figure 6.

Figure 6 Repeating ten day structure for main study plan

'WEEK' 1	'WEEK' 2
<ul style="list-style-type: none"><li data-bbox="119 994 391 1025">• Recruit School B<li data-bbox="119 1066 502 1097">• Collect data for School A	<ul style="list-style-type: none"><li data-bbox="699 994 1093 1025">• Analyse Data for School A

A decision was made to recruit three schools before data collection began. This would ensure that recruitment remained in advance of data collection and that at least three weeks were available for each parental consent process. This time lapse between consent and observation was also expected to help reduce participants' anticipation of being observed making their behaviour more natural. The 'weeks' within the project plan were chunks of 5 working days, not necessarily consecutive to allow for school holidays/inset days and also to ensure that all five weekdays with their different menus were observed.

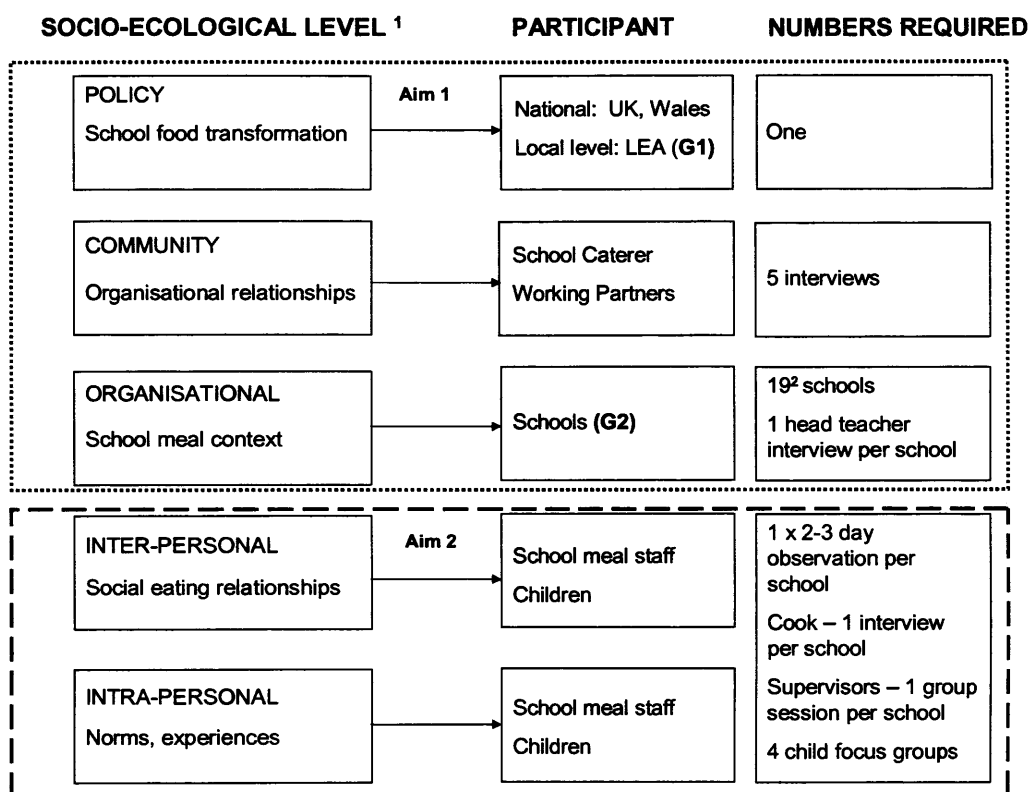
¹⁷ Full details of the pilot study and the methodological revisions that were made as a result are included in Appendix C.

Chapter 5 Method

5.1 Sampling and recruitment

The recruitment strategy was informed by considering the study's aims and objectives within the context of the McLeroy model. As shown in Figure 7, this required recruitment at each of the five SE levels.

Figure 7 Recruitment strategy



NOTES:

¹ SE level as defined within the McLeroy model (McLeroy, et al., 1988)

² Based on the number of schools that could be incorporated within one academic year

G1 - primary gatekeeper controlling access to schools and the school catering organisation

G2 - secondary gatekeepers controlling access to school meal staff and children

The principal driver behind the recruitment strategy was national policy with respect to the school meal programmes (C. E. L. Evans & Harper, 2009). As recommended by Grzywacz (2000), the SE scope of the study was simplified to facilitate a more detailed exploration of the remaining SE entities. This was achieved by limiting the

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study to the UK, thence to Wales, to ensure uniformity of context with respect to national policies. Thereafter, recruitment was limited to a single Local Education Authority (LEA) in Wales to ensure uniformity of context with respect to local policies within the LEA. In this way, SE relationships involving the policy level were less diverse. In Wales, school catering is undertaken by the LEAs rather than being contracted out, therefore, a single gatekeeper (indicated by G1 within Figure 7) had the authority to grant access to both the schools and the school meal caterer.

A pragmatic decision was taken to ensure that data collection was limited to one academic year. This was largely based upon the expected duration a PhD. Based upon the effort that had been expended during the pilot study (see Appendix C2.4), the project plan could accommodate a maximum of 19 schools within this timeframe. The minimum number of schools to be recruited was defined as 8 (2 per socio-economic quartile). Within these limits, the recruitment plan was to control the final sample size by theoretical sampling to allow the emerging theory to control the data collection when saturation of concepts was achieved (Bryman, 2001). Within each school, data collection was anticipated to involve one observation over 2-3 lunchtimes; one headteacher interview; one interview with the cook-in-charge; and, one group interview with midday supervisors (see Figure 7). The number of child focus groups required (in this case, school council sessions) was set at 1 per socio-economic quartile.

5.1.1 Recruitment at the organisational level

Wales is sub-divided into six Unitary Authorities and a pragmatic decision was taken to select an LEA from the Unitary Authority in which the researcher resided. The number of schools and percentage Free School Meal (FSM) entitlement of the LEAs in this Unitary Authority are shown in Table 13. FSM entitlement was used as a proxy measure to render the sample representative of the socio-economic spread within Wales. It is commonly used as an indicator of socio-economic status (SES) within education such that it forms the basis of school funding and reporting of performance figures (Local Government Data Unit Wales, 2006a), even though it has been reported as an imperfect proxy in this regard (Croxford, 2000; Hobbs & Vignoles, 2010). Nevertheless, it has been used as a proxy measure for SES in

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previous food related studies (K. H. Hart, et al., 2002). Within Wales, mean FSM entitlement per LEA was 13.77% (range 8.1% - 21.23%).

Table 13 Number of schools and FSM entitlement of LEAs within the target Unitary Authority

Number of schools	FSM entitlement
126	17.72%
104	16.89%
76	16.69%
53	16.78%
47	10.08%
39	16.25%
38	8.10%
30	20.22%
27	21.23%
Mean = 16%	

NOTES:

Figures obtained from the National Pupil Database in February 2007 (Local Government Data Unit Wales, 2006b)¹⁸.

The LEA used in the study is indicated in bold.

During the pilot study, the researcher was contacted by a parent who had received an information leaflet from the pilot school. The parent was a catering manager within an LEA who was undertaking a quantitative benchmarking exercise in preparation for the Appetite for Life roll out and who expressed an interest in collaborating with the study. As the LEA concerned consisted of a large number of schools from which to sample, had a FSM entitlement close to the mean for the unitary authority and also covered the pilot school, its Chief Schools Officer was approached first. Consent from

¹⁸ The data on this site was taken from the Pupil Level Annual School Census (PLASC). At the time of sampling, the data related to January 2006. The website has since been removed and the 2006 data is no longer available

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this LEA was obtained in August 2007 and no others were approached. In line with Foster (1996) and with the wishes of the Chief Schools Officer, each school's entry to the final sample was subject to willingness of its local gatekeepers to grant access and to sufficient number of participants willing to take part (see Appendix D2 for the consent form used for the LEA).

To support the recruitment of schools, a list was obtained from the 'Numbers on Roll April 2007' report published on the website of the target LEA. Primary schools were considered to be those attended by children across the 4-11 year age range, as opposed to infants schools or junior schools which are only attended by 4-7 or 7-11 year olds respectively. This was to further ensure a degree of SE uniformity across schools by eliminating the possibility that school policies contained age-specific considerations at odds with schools responsible for wider age ranges. Ten infants schools and eleven junior schools were excluded on this basis leaving 83 in the sampling frame. A stratified sample was created consisting of quartiles based on FSM entitlement. As shown in Figure 8, schools in each quartile were arranged in ascending order of school size to ensure the sample was also representative of any logistical problems that pupil numbers might create for school meal provision.

Figure 8 Extract from the Sampling Frame

Q1			Q2			Q3			Q4			
1	FSM	School	Size	FSM	School	Size	FSM	School	Size	FSM	School	Size
2	0	74	29	12.1	60	107	33.3	52	78	42.4	1	160
3	6.3	3	159	20.0	68	118	24.8	25	122	72.3	58	166

School sizes ranged from 29 to 542 pupils with the modal value being in the range 101-200 pupils (Welsh Assembly Government, 2006b) There were 21 schools in Q1, Q2 and Q4 and 20 schools in Q3. The pilot school fell into Q1. The recruitment order within each quartile (Q1 thru Q4) was determined using a random number generator provided by Research Randomizer (Urbaniak & Plous, 2007). Four sets of unsorted random numbers between 2 and 22 were simultaneously generated (see Figure 9).

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These represented the line numbers in the leftmost column of the sampling frame shown in Figure 8.

Figure 9 Extract from the randomly generated recruitment order

Set 1	Set 2	Set 3	Set 4
7	7	16	16
3	19	6	15
19	6	9	14
22	8	7	2
14	17	2	20
8	11	3	21
9	4	11	10
17	13	17	7

Schools were approached for recruitment by identifying the next school in the recruitment order within Q1, then Q2, then Q3, then Q4, then Q1 and so on to ensure a balanced spread of SES across the participating schools. The third school recruited in Q3 used the same dining hall as another school on the same site which fell lower down the recruitment order in Q2. A pragmatic decision was taken to approach the headteacher of the Q2 school, even though this introduced a degree of imbalance between the four quartiles.

Sample size was controlled by theoretical sampling which allows the emerging theory to control the data collection which ends when saturation of concepts occurs (Bryman, 2001). Although saturation began to occur during data analysis for the ninth school, Q1 and Q4 remained under-represented at that time. Therefore, it was decided to recruit at least one more school from each to obtain a more balanced split across the four quartiles, and re-assess whether theoretical saturation had occurred. However, recruitment from Q4 continued to present more difficulties than the other quartiles. Therefore, another Q4 school was recruited via a more targeted approach based on high FSM entitlement and its location within a city centre. This strategy was informed

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by the emerging data which had suggested that health promotion activity also found it hard to access Q4 schools, particularly in what was described as the ‘southern arc’ of the city. It was considered important to assess whether such a school would yield previously undiscovered concepts. As it did not, data collection ended at this point.

Table 14 shows a profile of the numbers of schools that declined participation across the four quartiles, together with those that remained in the sampling frame after theoretical saturation. Five schools were classified as declining after repeated attempts to contact the headteacher via telephone and/or e-mail were unsuccessful. Delaying recruitment due to further attempts to establish contact was regarded as too risky for the recruitment pipeline. The first three schools were recruited in September 2007 and a pipeline of 2-3 schools undergoing the consent procedures was maintained throughout.

Table 14 Numbers of schools declining or not approached

No of Schools	Q1	Q2	Q3	Q4	TOTAL
Declining	4 ^a	3	2 ^a	8	17
• Head teacher not contactable	1	0	0	4	5
• Impending/ongoing school inspection	1	1	1	1	4
• Research burden too heavy	1	2	0	1	4
• No provision for school meals	1	0	0	0	1
• Other	0	0	1	2	3
Not approached	15	14	17	10	55

^a One headteacher in each of these quartiles consented for information obtained during recruitment to be included

The final sample included eleven schools whose characteristics are shown in Table 15.

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Table 15 Characteristics of schools in sample shown by socio-economic quartile

Quartile 1 FSM range 0 – 6.3			Quartile 2 FSM range 7.0 – 18.2			Quartile 3 FSM range 20.8 – 33.9			Quartile 4 FSM range 35.0 – 77.9		
FSM	Size ^a	Uptake ^b	FSM	Size ^a	Uptake ^b	FSM	Size ^a	Uptake ^b	FSM	Size ^a	Uptake ^b
1.5	325*	52%	8.1	370	61%	27.0	267	46%	38.4	284	44%
1.1	208	48%	15.7	230	48%	22.0	104	45%	43.6	183	50%
			7.0	168*	60%	35.2	170*	56%			
			10.3	107	70%						

NOTES

FSM = percentage free school meal entitlement used as a proxy for socio-economic status

Schools marked * were not members of the Welsh Network of Healthy Schools Scheme

^a Pupils on roll

^b Percentage uptake of school meals (paid and free)

5.1.2 Recruitment at the intra- and inter-personal levels

The principal gatekeepers in the study were the Chief Schools Officer within the LEA, thence the headteachers of the schools. Once consent was obtained from the gatekeepers, the individuals who would be involved in the study were recruited separately. These were: a) staff within the catering organisation; b) representatives from their working partnerships with respect to healthy eating; and c), school-based participants, i.e., school meal staff and children.

Within each school, the access and consent protocol as tested by the pilot study and detailed in Appendix D1 was followed. This protocol was used as a checklist to ensure that all actions were carried out during the course of any telephone calls/visits made during the recruitment phase. Once the headteacher agreed to participate in principle, information packs were delivered to the school containing the items listed in Table 16.

Table 16 Within school recruitment materials

ITEM	See Appendix:
School cover sheet	D3
Parents' information booklet	
• Adult information sheet	D4
• Child information sheet	D5
• Parental opt-out sheet	D6
Adult consent form	D7
Post participation note	D8

The school cover sheet was prepared as guidance for the school administration staff who were asked to distribute and collect back the various forms. It showed how many of each type of form were delivered to the school, to whom they should be delivered, and gave indications of when a follow up call to assess consent levels and the observation itself was likely to take place. Following a request from a headteacher during the fourth recruitment visit, copies of the ethical approval, LEA consent and CRB approval were given to all subsequent headteachers. This was as an assurance to the parent/governor body that the headteacher had taken all reasonable steps to check the credentials of the researcher and the research. The post participation note was sent to the school following the data collection.

All information leaflets and consent forms had been translated into Welsh after the pilot study modifications. Bilingual information booklets for parents consisted of the participant and child information sheets together with a parental opt-out form. The children's information sheets were written in child-appropriate language and referred to the researcher by their forename to reduce the effects of power relations (Mauthner, 1997). Potential adult participants i.e., anyone likely to be in the dining hall at lunchtime, received bilingual information sheets and consent forms. In the event that the cook was available at the time of the initial visit, contact was made to allow her to distribute forms directly to her own staff.

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Table 17 Numbers of children excluded by their parents and lunchtime supervisors declining interviews per school

Quartile	School	Number of children excluded by parents	Number of Supervisors declining interview	Number of Supervisors consenting to interview
Q1	1	5	7	0 ¹
Q1	2	1	0	5
Q2	3	2	2	2 ²
Q2	4	0	1	4
Q2	5	1	2	2
Q2	6	0	2	0
Q3	7	9	8	0
Q3	8	0	0	2
Q3	9	1	6	2 ²
Q4	10	3	6	2 ³
Q4	11	1	2	4 ⁴
TOTAL:		23	36	23

NOTES:

¹ Senior supervisor declined interviews on behalf of the whole supervisory team

² One interview was not conducted due to sickness

³ The two consenting supervisors were interviewed together

⁴ Despite consenting, one supervisor could not be reached on the telephone number provided

Twenty-three children were excluded from the study by their parents. This ranged from 0-9 per school (mode = 1) with three schools having full participation (see Table 17). Amongst the adult participants, the only instances of participation being declined related to midday supervisors being interviewed – all of the midday supervisors consented to being observed. Only 39% of supervisors agreed to be formally interviewed with three schools receiving no representation at all (see Table 17). In one school, the senior supervisor refused on behalf of all the supervisors, some of whom intimated during the observation session that they would have consented had this not occurred. Of the twenty three supervisors who consented to be interviewed, two either sick on the days of the study and one could not be reached on the telephone number given.

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With respect to the school council sessions that were an integral part of research question A1.3, none of the school council members were been excluded from the study by their parents. The age and gender of the participants is shown in Table 18. The groups were observably of mixed ethnicity but the children were not canvassed for their ethnic origin.

Table 18 Characteristics of focus groups

	School 1	School 2	School 3	School 4	TOTAL
	FSM = 2%	FSM = 16%	FSM = 27%	FSM = 44%	
Males	13, 6-10(8)	7, 6-11(9)	5, 8-11(9)	6, 9-11(10)	31, 6-11(9)
Females	6, 9-11(10)	7, 6-11(10)	6, 7-10(9)	6, 8-11 (10)	25, 6-11(9)
TOTAL	19, 6-11(9)	14, 6-11(9)	11, 7-11(9)	12, 8-11(10)	56, 6-11(9)

NOTES:

Format of cells = number, age range in years (average age in years)

5.2 Data capture procedures

The data sources used during the study are shown in Table 19 together with the foreshadowed SE levels and research questions that they were intended to explore. Data collection took place between June 2007 and April 2008. The Appetite for Life Action Plan was launched in November 2007 (Welsh Assembly Government, 2008a), midway through data collection.

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Table 19 Data sources used and their relationship to the research objectives and SE levels

Data Type	Number	SE level(s) explored	Research Objective ¹	Average Duration
Dining Hall Observation	11	Organisational	A1.2	2-3 lunchtimes
		Inter-personal	A1.4	
		Intra-personal	A2 (all)	
Kitchen staff Interviews ²	10	Inter-personal	A1.2	20 minutes
		Intra-personal	A2 (all)	
		Policy		
Supervisor Interviews ³	19	Inter-personal	A2 (all)	10-20 minutes
		Intra-personal		
		Policy		
Headteacher Interviews	11	Policy	A1.1	30-45 minutes
		Community	A1.4	
LEA/partner Interviews	6	Policy	A1.1	60 minutes
		Community		
Focus Groups ⁴	4	Inter-personal	A1.3	30 minutes
		Intra-personal		
		Policy		

NOTES:

¹ Research aims and objectives are included in Section 3.5.1

² One cook catered for 2 participating schools. Kitchen assistants contributed to the interviews where workloads permitted

³ Some supervisors declined to be formally interviewed (See Table 17). Additional, informal discussions were recorded in observation fieldnotes. For 3 schools, this was the only data available from supervisors.

⁴ One per socio-economic quartile. This included the pilot school and three others

5.2.1 Dining hall observation procedure

During the telephone call to the school to assess consent levels, convenient days were arranged for the observation sessions ensuring that each day would be as typical as possible, e.g. that no year groups/classes were out of school or that no special activity was ongoing. This was generally done with the headteacher but occasionally via the

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school secretary if the headteacher was unavailable. In any particular school, the observation occurred 2-6 weeks after the initial distribution of leaflets dependant on term dates and the robustness of the recruitment pipeline. Over the course of the study, observations were done on each week day to ensure that all idiosyncratic variations were captured, e.g. 'cooked dinner' days fell on Thursdays.

A written observation protocol was taken to each observation session to ensure that each adhered to uniform procedures (see Appendix D14). On the first observation day, arrival at the school was approximately half an hour before the start of the lunchtime to allow time for the consent and opt out forms to be collected and checked, and for a list of the opted out children to be drawn up. Convenient times for the school based interviews were determined as and when contact with potential interviewees was made. The kitchen staff were mostly on duty at this (extremely busy) time and a courtesy visit was made to them by means of introduction and to put them at ease. A schematic representation of the empty dining hall was made before lunch began. Interviews notwithstanding, arrival on subsequent days was later and on day 2, with the permission of the headteacher, photographs of the dining hall set up and equipment were taken in some cases, e.g. during the early observations and in schools where an 'unusual' feature was observed.

During the lunchtime, notes were taken on the observation schedule (see Appendix D15) using the published menu of the day as reference. One schedule was used per school except in cases where two dining halls were in use, in which case, separate schedules were used. Towards the end of the school based data capture, the structure of the schedule became a hindrance as its contents were well known and the constant attempts to locate the 'correct' page became counter-productive.

School staff were asked to discretely identify any children excluded from the study by their parents - although in three schools, there were none (see Table 17). No notes were taken regarding any activity involving such children. However, it was occasionally the case that intense activity levels and confined spaces rendered identification impossible. In this case, the observation was done from a greater distance away from the mass of children, e.g. from the edge of the hall rather from

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amongst the tables or next to the servery. It was common for the dining halls to be crowded and for activity levels to be high. In these cases, observation was also done from a distance at peak times which had the advantage of allowing it to be less perceptible to the subjects.

Staff on duty during the observation were usually intensely busy. During the early observations when accessing supervisors for interviews was problematic, opportunities to engage them in conversations about their work were taken where possible. Later on, this was only done if something immediately noteworthy or that was not clear was done e.g., the use of stickers.

Observations generally took place over two (usually consecutive) days although three days were required in one case where children were split between two dining halls. Written notes were typed into fieldnotes after the final observation session and were generally fleshed out with reflective notes and wider recollections from memory prompted by the sometimes brief notes taken at the time, e.g., the physical structure of the hall based on the schematic as drawn. To facilitate a consistent approach during analysis, a fieldnote template was used (see Appendix D16) whose structure was based upon the observation schedule. This greatly assisted subsequent analysis and recall over and above the written notes.

5.2.2 Interview procedures

Interviews were conducted with headteachers, school meal staff, and representatives of the LEA and its healthy eating partners, some of whom were suggested by other interviewees. All interviews followed a standard protocol outlined in Appendix D9. Before the interview, the consent form (see Appendix D7) was completed. The LEA/partner interviews followed a semi-structured interview schedule (see Appendix D10) which was designed to explore the school meal context with respect to policies, guidelines, issues etc. that affected school meal provision. Each interview used additional questions to elicit the specific expertise of the interviewee where appropriate. The interviews were recorded, typically lasting an hour, and transcribed as soon as practical afterwards.

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The post-observation interviews adhered to a protocol drawn up for the study as included in Appendix D12. and involved the kitchen staff and the midday supervisors. The cooks were generally willing to take part in a post observation session which was usually done after the second observation, occasionally requiring a separate visit to the school to accommodate the cook's work schedule. Although kitchen staff were invited to take part as a group, the cook usually did the interview alone as the kitchen assistants were busy. This was not a major issue since some questions were not those you would expect kitchen assistants to answer, e.g., on procurement or uptake issues, and cooks would occasionally shout across the kitchen for input from colleagues. The post observation interview schedule was followed as included in Appendix D13. This included questions intended to clarify activity that had been observed but warranted fleshing out verbally as annotated on the observation schedule. For example, due to problems with not being able to get close to the servery and not wishing to intrude on (and distort) the interactions, it became usual to ask how (and if) the servers would offer the food choices and encourage the children to take the food. The schedule was also adjusted as data capture progressed to gather data on emerging themes not envisaged at the outset, e.g., on how and why they would alter menus from the LEA published menu. Interviews were recorded, typically lasting 10-20 minutes and transcribed as soon as practical afterwards.

Midday supervisors were generally unwilling to take part in a post observation session. To try and compensate for this, attempts were made to engage with them with them during the observation where the emphasis was to expand on or clarify events or acts that had been observed, e.g. an interaction with a particular child. This focussed, outcome-oriented approach to capturing participants' experiences whilst they are within the environment of interest borrows from the principles of the 'go-along' method which is a fusion of observation and interviewing (Carpiano, 2009; Kusenbach, 2003). Those approached were always willing to answer such questions regardless of whether they had consented to the post-observation interview. If it felt appropriate, such supervisors would be asked if they were willing to share their reasons for not wanting to be interviewed as it became apparent that these were useful for the study to understand.

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Another difficulty encountered with supervisors that were willing to take part in the post observation interview was scheduling time to do it since supervisors generally only attended the school for a brief period of time, were extremely busy during that time and generally keen to leave promptly after their shift. However, it became apparent that the interviews would not last longer than 5-10 minutes, therefore, towards the middle stages of the data collection, the interviews were conducted individually by telephone at a time convenient for the supervisor. This increased the number of interviews possible. A special, concise telephone interview schedule was drawn up which was closely adhered to (see Appendix D13). The responses received were also very similar such that theoretical saturation from this type of data was reached very quickly suggesting that early recruitment difficulties had minimal impact on overall data quality. Each telephone interview started off by assuring the confidentiality of the supervisor and school and asking permission to record the telephone call. Only one supervisor refused to be recorded and so notes were taken at the time. Interviews were recorded, typically lasting 5-10 minutes, and transcribed as soon as practical afterwards.

The school management interview took place with the headteacher, usually after the final observation, subject to the headteacher's diary commitments. The standard interview protocol was used (see Appendix D9) together with the school management interview schedule as revised after the pilot study (see Appendix D11). Specific questions suggested by the observation were also used, e.g., 'Could you explain how the reward system as it relates to the dining hall works?' In all but two cases, interviews were recorded, typically lasting 20-40 minutes, and transcribed as soon as practical afterwards. In one case, the recorder was turned off during the interview for a time whilst a sensitive issue was discussed. Notes were taken by hand at the time where a voice recorder was not used.

5.2.3 School council data collection procedure

To mitigate against researcher preconceptions and promote greater understanding of participants' views, less structured techniques are recommended allowing research questions to be answered within the participants' frame of reference (T. May, 2001). As it was considered important to elicit a child-centric interpretation of school meals

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and promoting healthy eating, the questions presented to the children used child-friendly language. 'Promotion of healthy eating' was operationalised as 'being encouraged to eat school dinners'. This phrasing was informed by the pilot study (see Appendix C) where the headteacher reported that their school council wished to discuss ways of encouraging the infants (ages 4-6) to eat their school meals. Three broad discussion questions were posed:

Q1: "Do you think some children need more encouragement to eat their school dinners?"

Q2: "Why don't children want to eat their school dinner?"

Q3: "Do you have any ideas about how to encourage children to eat their dinners?"

No further procedural instructions were given since one objective for this part of the data collection was to explore how the schools conducted the school council session¹⁹.

5.3 Method of analysis

Data collection and analysis were carried out in tandem (Foster, 1996). For the majority of the data collection period, analysis was assisted using ATLAS.ti v5.2. This allowed the data to be organised so that they could be stored and retrieved efficiently during the interpretative analysis and broken down into conceptual categories, grounded in the data.

Using the features of ATLAS, data files (primary documents) were loaded and organised into 'families'. Codes were added at the 'manifest' level of what was said or observed and at the 'latent' level where meaning was inferred from the words spoken or actions perceived (Mason, 2002). Codes were assigned to selected quotations and hyperlinks were inserted between quotations to link, for example, interview extracts that exemplified notes taken during the observation. This phase of the analysis allowed an assessment to be made of when theoretical saturation was being reached. At that time, the more advanced features of ATLAS were explored with the primary objective of summarising that data for a supervisory meeting. However, as ATLAS is not able to organise data into more than a two-tier hierarchy (via its concept of code

¹⁹ The approach adopted by each school is presented in Section 6.3.1 and discussed in Section 8.3.2

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families) nor is it able to diagrammatically represent anything other than networks of freestanding codes, its continued use was questioned. After exploring the capability of NVivo as an analysis tool, it was decided to switch to NVivo Version 2.0.163. This followed discussions with other active researchers who felt that NVivo2's modelling capabilities were superior than those in NVivo7, and the fact that an NVivo2 project can be upgraded to NVivo7 but not vice versa.

The codes set up in ATLAS were converted into free or tree nodes as appropriate in NVivo2 and linked to the same areas of text in the interview, focus group and fieldnote documents. Although this had to be done manually, it provided an opportunity to remove any duplicate codes and also to revisit early documents and add any codes that had been created during the later stages of the original ATLAS analysis. This was a worthwhile exercise in its own right. Emerging themes were built up within NVivo using memos linked to codes using an 'expanding drop file' approach (Wolcott, 1990, p38). Examples of these emerging themes include 'length of lunch time', 'staff attitudes', 'SE systems' and 'choice'.

Chapter 6 Organisational level implications for policy and eating behaviour

Research aim 1 sought to understand the school meal context and its implications for nutritional policy and primary school-children’s eating behaviour. It was supported by four research objectives:

- A1.1 To explore the pragmatic influences on formal or informal LEA and primary school policies which affect the food available during school mealtimes.
- A1.2 To explore the professional practices of school catering staff which influence the food made available and served at lunch time.
- A1.3 To assess the implications of using school councils for food related pupil consultation.
- A1.4 To investigate the social, physical and temporal characteristics of primary school dining halls and their implications for eating behaviours.

The findings relating to each objective are presented separately. Quotations from interview transcripts are included throughout this chapter, supplemented by direct extracts from observation fieldnotes where applicable. The study participant to whom the quotation is attributed is indicated in parentheses immediately after the quotation using the structure indicated in Table 20.

Table 20 Participant IDs assigned to data sources

Format of Participant ID	Data Source
Qx-nn-C01	Kitchen staff Interviews
Qx-nn-F01	Fieldnotes
Qx-nn-Syy	Supervisor Interviews
Qx-nn-SM1	Headteacher Interviews
LEA-01 thru LEA-03	LEA/partner Interviews
CONT-01 thru CONT-03	
FG1 thru FG4	Focus Groups

NOTES:

Qx = Quartile in which the school was located

nn = School identifier within quartile

yy = sequential numbers assigned to supervisors within each school

6.1 Pragmatic influences on policies affecting the food available during school mealtimes

Comparing documented policies at national level with interview data obtained from LEA catering managers and headteachers suggests that policies influencing the food available during primary school mealtimes were influenced by managerial decisions within and between separate entities at the organisational level (national government, the LEA, the school and the kitchen). These decisions reflected differing priorities salient to each organisation which included: a) the need to protect school meal uptake; b) issues surrounding food choices; and, c) child-centred considerations such as ensuring children do not go hungry.

6.1.1 National priorities

The national policy relevant to the study was the Appetite for Life consultation document and the associated action plan (Welsh Assembly Government, 2006a, 2008a). Its key points relating to food availability (as opposed to other objectives such as sustainable procurement) are outlined in Figure 10.

Figure 10 Key points from the Appetite for Life Action Plan

The Appetite for Life programme defines the strategic direction and actions required to improve the nutritional standards of food and drink provided in schools in Wales. It uses as its basis the UN convention on the rights of the child and was devised following a consultation exercise that included children's views.

Its key points *relating to food availability during school meals* are:

- Revised and stringent minimum nutrient standards for school meals
- Improved uptake, particularly of free school meals
- Monitoring of the effect of revised nutrient standards on uptake
- To provide caterers with the skills to prepare and promote healthy food choices
- To ensure consumption of the healthier meals offered by working with children
- To encourage schools to draw up school food policies

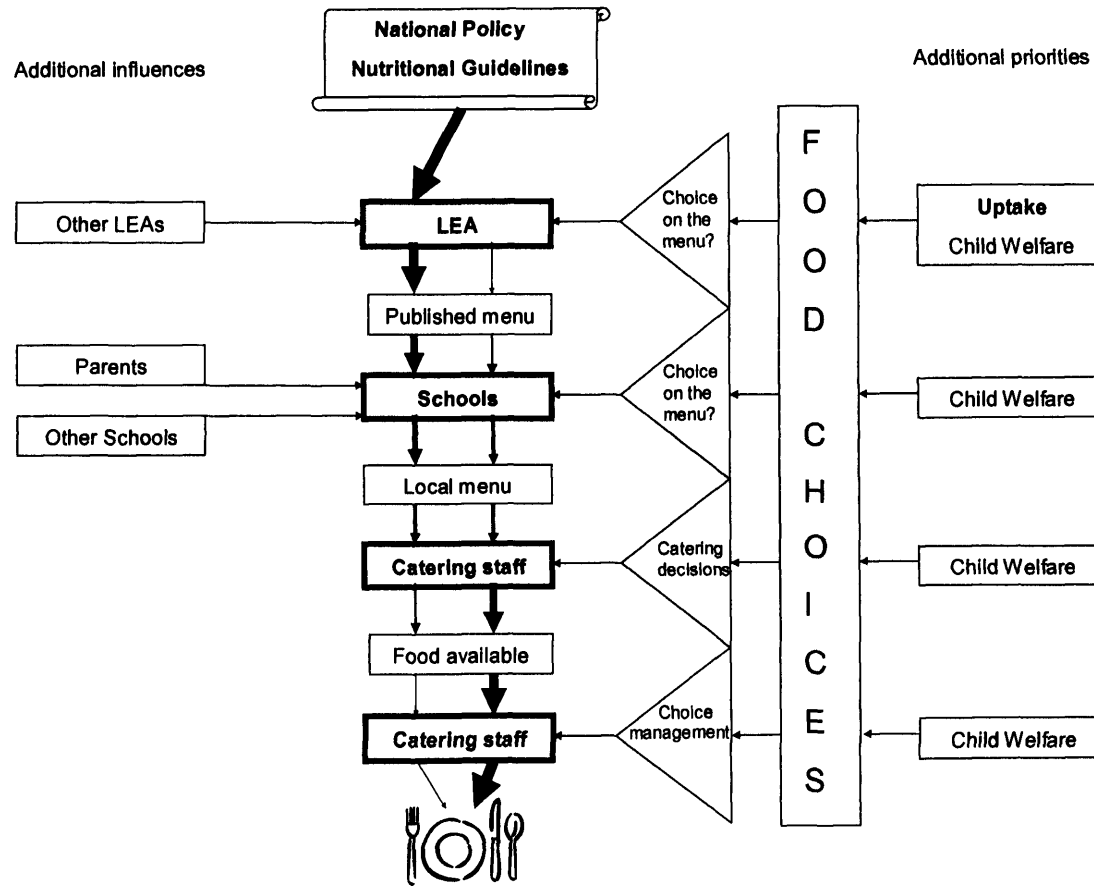
Source: Welsh Assembly Government (2007)

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Improving the nutritional standards of food and drink provided in schools in Wales was the principal strategic objective of the national policy. A lesser objective was the need to improve school meal uptake, primarily with respect to those eligible for free school meals as a means of tackling child poverty. Although the policy targeted diet as a means of improving child welfare, explicit references to child-centred eating behaviours were confined to the need to ensure children consumed nutritional food.

There were then three levels of influence through which the national policy passed en-route to becoming practice. The first was the LEA catering service, which was located within the education department and from which all the primary schools that offered school meals received their food. Thereafter, at school level, school meal policies could be formal or implicit by virtue of practices in place in the school. Although the Appetite for Life action plan was working towards formal Food and Fitness policies in schools, this was not a requirement at the time of the study. The third level of influence was the catering staff, comprised of the cook-in charge and kitchen assistants who were responsible for food preparation and service. The national policy evolved as it passed through these socio-ecological levels as each included priorities salient at that level (see Figure 11). Some of these priorities reflected the influence of additional sources (e.g. parents not wishing children to be offered cold lunches).

Figure 11 Transformation of the food availability policy



6.1.2 LEA priorities

The LEA school food policy relevant to the study period (June 2007 – April 2008) was published on the authority’s web pages, as were the primary school menus (see Figure 12). At this SE level, and in order of priority, consideration was given to nutritional balance and uptake; inclusion of choices within menus; and, consideration for the welfare of the children.

Figure 12 Key points from the Local Authority primary school meal policy

Key points from the Local Authority primary school meal policy

- To follow the national guidelines for nutritional standards
- To provide a piece of extra fruit, salad and bread daily
- To provide a cold meal option

Sample from the published hot meal menu:

Chicken wrap	Vegetable choice	Iced ginger cake
Pasta Napolitan (vegetarian)		Fresh fruit
Oven baked herby potatoes		Low fat Yoghurt

Sample from the published cold meal menu:

Filled Rolls	Crisps	Fruit
Sandwiches	Juice drink carton	Dessert
Baguettes	Bottled flavoured water	
Salad Bowls		

Source: Local Authority web pages during July 2007-April 2008

6.1.2.1 Nutritional balance, school meal uptake and cost

Nutritional balance remained a dominant objective within LEA policy by virtue of the emphasis placed upon it within national policy. Whereas, improving *free* school meal uptake had featured in national policy (see Figure 10), it was not mentioned by any of the participants in the study, at any level. Without exception, the narratives of LEA

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managers revealed that it was the closely related concept of *overall* school meal uptake (i.e. paid and free) that influenced LEA policy due to the economic considerations of running a school meal service:

“Nutrition and balance have to be the king pin really because that’s where the legislation is coming from, but at the same time we’ve got to focus on popularity of dishes as well. If the numbers drop because the children don’t like the food then we can’t sustain the business” (LEA-01)

Interviewee:this LEA is not in a position to fund central government’s policies in its current state. It’s not reasonable to expect any authority who are already struggling to balance the budget to suddenly take on a load more stuff from the Assembly and whilst effecting that put itself into several millions pounds worth of debt.

Interviewer: So you have got to constantly strive to keep your take-up acceptable or it’ll all self-destruct.

Interviewee: Yes and there are examples of that in England straight away. English County has closed its service and handed it down to the schools and what they are handing to the schools is a debt”

(LEA-03)

Thus, the need to maintain the school catering service as a viable business ensured that uptake had to be considered at the outset, *before* implementation. This contrasts with the national level where the emphasis was to look at the effects of the policy on uptake *after* implementation (see Figure 10). One means of determining ways to protect uptake was to monitor the experiences of other LEAs in England as well as Wales:

“Some authorities have tried [removing choice from the menu] yes and it’s a very big gamble. [One authority] tried it last year and their meal numbers went through the floor”. (LEA-01)

Two LEA managers also reported that a further implication of maintaining the school catering service as a viable business was the need to control costs:

“We all have to make sure that costs are kept down and whereas perhaps there was additional monies and budgets to meet the health agenda in those days all

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that's been stripped out so we're actually running on food and labour and that's about it. The authorities have very, very tight budgets" (LEA-02)

"we know on a 3 weekly [menu] cycle ... that we'll meet our costs, we covered all the nutrition, the balance is all there, everything is safe and so forth." (LEA-02)

"we have to control everything. If you think of the volumes we do, if we overspend a penny every day, it soon mounts up. You're talking about before the end of the year you've got £100s of thousands of pounds lost" (LEA-03)

6.1.2.2 Choice on the menu

The lunchtime menu published by the LEA was the end result of its policies with respect to food availability. A three-weekly repeating cycle of meals was offered with two choices of entrée, side dishes and desserts, plus vegetarian and special dietary options (see Figure 12). In addition, fresh salad, extra bread and a piece of fruit were made available. The inclusion of a choice of entrée on the menu was a policy decision made at LEA level that all viewed as a facilitator towards the achievement of the LEA's strategic goal (i.e. to provide a nutritionally balanced meal whilst maintaining uptake and ensure that children ate something midday):

Interviewer: Do you try and tackle dips in take up?

Interviewee: We have to. That's the whole thing with the choice really. With the choice menu, you have to put on a balance of foods. We know that children aren't used to having beef cobbler so it's got to be a popular dish with them. If it wasn't a popular dish we wouldn't get anybody in that day, they'd all bring sandwiches or they wouldn't eat anything...if you think well I'll put beef cobbler on or nothing else and they're going to have to have it, well yes, they might get used to it, but do you want to take the risk of them either going away and not having eaten anything or they'll decide next time they'll bring sandwiches." (LEA-01)

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Interviewer: In terms of the structure of the menu [LEA] offers the children a choice and I was reading your menu on the wall and that works off a choice. Is that typical across Wales or are some no choice?

Interviewee: Mixed I'd say. Most of us run a choice in the primaries. We may have some that do a single choice.

Interviewer: Do you know what would drive a decision like that?

Interviewee: Individual policy and finance. *(LEA-02)*

However, providing the children with a choice introduced the risk of restricting the children's experience of foods since they always opted for the food they liked:

"...the infants, that's the time when you do want them not to be choosing between anything because actually what you are trying to do is expose them to everything." *(LEA-03)*

LEA policy also included a cold lunch choice (see Figure 12) which functioned both as a nutritionally balanced alternative to the home-produced packed lunch and as a means of increasing school meal uptake. A reporting system that reflected the quantities of food prepared, sold and wasted was used to identify unpopular menu items which would be removed from the menu:

Interviewer: How often does a menu item like that [beef cobbler] persist before pupil power or whatever removes it?

Interviewee: That one is coming off... It was one of those that either went very well or didn't go well and you couldn't get in between. Some of the cooks were saying why are you taking it off it's popular and there was others that just couldn't get the kids to try it for love or money.

(LEA-03)

6.1.2.3 Child-centred considerations

At LEA level, a child-centred ideology was more prominent than at national level:

"..we're all on the same side here, coming from different angles at it, we might not always agree, I might not agree with policy setting, they might think I'm being bloody minded for refusing to implement but we all are here for the good of the children and if you lose sight of that focus you may as well go home". *(LEA-02)*

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This was exemplified by recognition of the role of school lunch in sustaining the child throughout the day, as opposed to its potential contribution to long term health. It was not considered acceptable to risk children going hungry as a result of them not wanting the food that was available at lunchtime. The following extract from a member of the LEA's A4L working group (which contained members from partnership organisations) illustrates the direct link between school meals and the child's nutritional welfare:

“in terms of school catering services you'll be aware that in England they really, really have been quite negatively impacted by the whole Jamie Oliver thing and certainly what we're very keen to hold on to within [LEA] is our school meals service because there may be scope for development, we can improve it, but what we don't want to happen is to lose that completely because we know that what the pupils are getting at the moment with the school meal service is actually much, much better than if they were bringing in packed lunches or having what parents would provide” *(CONT-01)*

The extract is interesting in that it alludes to the influence of the Jamie Oliver media coverage on the school meal service. The 'Jamie Oliver effect' was spontaneously mentioned by all categories of participants except midday supervisors. At LEA level, views were divided as to whether this influence was negative or positive:

“The Jamie Oliver programmes knee jerked a lot of people into unnecessary action. Certainly their production company spent 6 months going to find the worst example that they could and then presented it as the norm on TV which shook the foundations of the service and sadly people believe what they see and read and the media is a great informer. Certainly in Wales, I don't think there was any need to worry at all about the quality of the service.” *(LEA-03)*

“I would say that this improvement has been happening perhaps in the last 10 years more or less because when Jamie Oliver came out with his programme a few years ago, not many years ago, perhaps 5 years ago, which revealed how school meals were run down and the poor quality of food in Wales that has been very negative because although work was needed and is still needed, it's a very complex area what happened was that his programme made a perception that we all had, tangible. So we all thought school meals were no good but

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nothing happened but then from that programme on every one loudly said ‘school meals are rubbish’ without knowing that actually in quite a few areas they were trying to improve the service.” (CONT-02)

6.1.3 School priorities

School meal provision did not fall within the direct responsibility of the headteachers interviewed. In contrast to the findings at national and LEA level, although some headteachers mentioned the requirements for school meals to be nutritionally balanced, school meal uptake was not mentioned by any of them. At school level, child-centred considerations, such as the development of their nutritional behaviours, the need to ensure they did not go hungry during the day, were the dominant influence on school meal policy, most particularly with respect to whether or not the school offered choices within the lunchtime menus. As had been found at LEA level, schools were subject to other SE influences emanating from, for example, the home, the media and the children themselves.

6.1.3.1 Inclusion of choice

Whether or not to include choices on the menu had become a priority decision at LEA level and continued to be so at school level. Indeed, the final decision as to whether the menu that was actually offered to the children included choices rested with the school. However, unlike at LEA level, it was not a decision that was made to preserve uptake, it was made by considering the needs and abilities of the children as this extract from a catering manager illustrates:

“... it’s determined by the school and the governing body. If they don’t feel that the little ones can cope, or they are such a large school that they just haven’t got time to let them choose, we will listen to them. We are very happy to have a non-choice menu for infants, absolutely happy.” (LEA-03)

Indeed, one school in the study did not offer choices to its reception class. Similarly, the final decision regarding the provision of cold meals in addition to hot meals also rested with the school and variously reflected the views of either the headteacher:

“we have to have parental permission for the [cold meals]. I have to have a letter from the parents because, you know, well just because.” (Q2-01-SM1)

or, more commonly, the cook:

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“the waste is good now because they understand that if they don’t want hot lunch they can have a grab bag so they’re given the option there” (P01-C01)

Interviewer: Do you offer the grab bags?

Cook: We’ve had those. In fact, we used to do 3 choices here for juniors but we’ve now found it was getting too much and the cost of the grab bag if you are doing baguettes and things, it’s quite expensive. (Q1-02-C01)

or the parents:

Interviewer: Do you do the [cold meals]?

Cook: No.

Interviewer: Why is that?

Cook: A couple of the parents don’t like them. The children do (Q3-03-C01)

“The children are not allowed to have a grab bag unless their parents request it. They don’t have them as a choice or anything, this is just the parents have said they can do it” (Q2-01-C01)

On the days of observations, three schools offered grab bags to all children and one offered them to juniors only.

The dual themes that influenced decisions regarding choice on the menu (i.e., the children’s needs and abilities and the existence of external influences) were also evident in school meal policies²⁰ regarding desirable eating behaviour.

6.1.3.2 Children’s eating behaviour and school policy

Whereas the child-centred considerations in national policy were in the context of addressing child poverty, many headteachers made explicit references to eating behaviour when talking of their school meal policies. Typical considerations concerned the correct use of cutlery and, more commonly, the order in which children ate their food:

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“They understand that they have to eat with a fork, preferably knife and fork, and that they are only allowed to use a spoon when there’s pasta. We have to set rules and regulations” (Q2-01-SM1)

Headteacher: It’s just really to get them into the practice of eating their main meal before they go on to their sweet.

Interviewee: Do you find that they accept that?

Headteacher: Yes it becomes practice for them. The only downside of that is that a child may have their hand up for quite a while before somebody notices because there’s so much hustle and bustle there so there can be a down side and I think older infants, we could, you get to know the children, and they could go on straight away to sweet then because there could be a delay. It’s not a hard and fast rule but is *to ensure that children actually eat their meals* and eat the meals in the correct order. (P01-SM1)

The italicised section of this extract also illustrates how the headteacher expresses a concern that the children receive some nourishment at lunchtime. A later extract from the same interview illustrates how the perceived importance of this was influenced by the school’s socio-economic status such that, if the school considered itself as being in an affluent area, there was often an assumption that the children would be well fed at home:

“We’ve got to remember as well that there are a minority of children here that may not fit into that category. We do have children that we have concerns about so it would be wrong to assume that all the children have breakfast for example. Although I’ve said it isn’t a huge priority because we feel that they do but it would be wrong of us to naturally assume that all of the children have a nourishing meal at home. Although that is in the main” (P01-SM1)

A similar view is illustrated by this extract from a headteacher in Q2 (the second highest socio-economic quartile):

²⁰ Schools in Wales are now required to have a formal Food and Fitness Policy. This was not the case at the time of the data collection.

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“They are well fed at home, most of the children, well all of the children here. So you know that this is not their only meal and they do get breakfast and they do get food afterwards” *(Q2-02-SM1)*

This extract also illustrates how school policy and concerns over children’s eating behaviour in school were influenced by the home.

6.1.3.3 Additional SE influences on school policy

School policy was influenced by additional SE entities which were primarily the home and to a lesser extent, the media and the children themselves. Conflicts of responsibility and influence between home and school with respect to the children’s eating behaviour were evident in many narratives across all socio-economic quartiles:

“you’ve got parents who are very conscious of healthy eating and you see it in their children when they go, they are conscious of having vegetables. There are other parents who obviously give in a bit and you see that then when the children don’t take vegetables and things” *(Q2-02-SM1)*

“when you get to something, and I’m going to use the word complicated, as eating habits, it varies from home to home and it’s very difficult for us, 5 days a week for a fraction of the year to encourage the children to eat something that they haven’t been encouraged to eat at home” *(Q2-03-SM1)*

“Some of the parents have tried ‘But they don’t eat fruit’. I say ‘Oh that’s a shame, can they bring in...’ and they say ‘No’. I say they cannot bring in pretzels or whatever. ‘Oh he won’t eat milk’, ‘Oh well there’s water there’. ‘Well can he bring in flavoured water’, I say ‘No, no, there’s water there’, water is available. It’s the parents who push you see” *(Q2-01-SM1)*

“children are getting harder. There’s no doubt whatsoever in terms of eating habits especially. What they are used to doing at home, how they eat. Very few children eat at tables nowadays” *(Q3-01-SM1)*

“It’s different types of food that they’re not in the habit of eating at home and that’s the dilemma” *(Q4-01-SM1)*

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To a lesser extent, the influence of the media on school food policy was evident. As at LEA level, this related to the influence of Jamie Oliver which was perceived as the catalyst for improving the food on offer and a subsequent dip in uptake:

“There is a great drive at the moment, some say led by Jamie Oliver but that’s debateable, towards healthy eating and the food produced by Cardiff has improved tremendously” *(P01-SM1)*

“It did used to be more dinners than sandwiches and Jamie Oliver had a lot to do with it but that didn’t happen here at the time of his programme it was about a year, 2 years afterwards we lost a lot of children” *(Q1-02-C01)*

All schools had school-councils through which the children could air their views (which was a legal requirement). Each headteacher was actively questioned about the extent to which children used their councils to influence school food policy. Only one council had actively raised school meals as a topic for discussion.

“every school has to have a school council and we’re fortunate enough to have a school council here for quite a time now and they actually do suggest the kind of thingsone of the decisions, if I can just, some of the decisions they’ve come up with recently with drinking fountains for children, one of them was a concern that infants were not eating their meals and to look at strategies for getting infants to eat their meals” *(P01-SM1)*

“the school council look at things like lunchtime. They were doing it the other day, they went around doing a learning walk for behaviour at lunch time. All the things they picked up on and then the next meeting is about what can we do about these behaviours” *(Q1-02-SM1)*

“I don’t think there’s anything particularly set up for the school council to address regarding school dinners at the moment but it’s something we could look at because certainly they are asked to comment on all aspects of school life” *(Q3-02-SM1)*

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6.1.4 Priorities of kitchen managers

All school kitchens had a 'cook-in-charge' whose responsibility was the management of the kitchen itself. The dominant considerations at this level were concerns for the welfare of the children, most particularly that they received some nourishment at lunchtime. As had been found at school level, consideration of nutritional balance and school meal uptake were afforded a lower priority.

6.1.4.1 Child welfare and kitchen practices

A strong child-centred ideology was evident in the narratives of all the cooks-in-charge that demonstrated a concern for the welfare of individual children, similar to that seen at school level, but in contrast to the more generic concerns found at national and LEA level. This could influence the food offered to the child and most commonly occurred when the child could not be persuaded to take an adequate meal. The priority would then switch from the serving of a balanced meal to ensuring that the child did not go hungry and at least ate something:

"I'll say well 'if you really don't want this will you have a ham or a cheese or a whatever roll' and they'll probably say 'OK' and then that's the problem solved and then I'll tell them they can go and have salad and they can have a pudding of their choice as well. So at least you know they are having something to eat."
(P01-C01)

"A couple of the girls yesterday, all they took was chips and I said 'well that's not going to fill you up all day is it?' They're high to fill and then what we give them is really low so we try to give them extra bread and things like that"
(Q3-03-C01)

"Obviously we need to make sure they eat something, we don't let them go out with nothing at all"
(Q4-02-S03)

6.1.4.2 Nutritional balance, school meal uptake and cost

The need to actively consider nutritional balance within school meals at the level of kitchen managers was not common as it was so heavily entrenched within the policy making that preceded the development of the published menu.

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“They’re so strict now with the menus. You can’t add one it doesn’t say. Like I can’t add, just say for instance the apple and blackberry crumble was a little bit sour, I’m not allowed to add sugar because the dietician has done all that so that everything a child needs is in that menu” *(Q3-02-C01)*

However, if a menu item was really unpopular or not available due to supply problems, it could be substituted for another of equal nutritional value.

“I [headteacher] was talking to her [cook-in-charge] the other week when the Appetite for Life co-ordinator was here actually and she was saying that the options that day were sausages and that was all it was because it was either ordinary sausages or vegetarian sausages and she said ‘Well some children don’t like sausages’ so then they’ve had it so she was cooking something extra to go with it so that there was more of an option. So she does plan ahead like that and she knows what’s not going to go down so well and tries to have a back up so that’s great.” *(Q3-02-SM1)*

“Wednesday when the stuff came in they didn’t deliver any of the potatoes that we needed which would have been the jacket potatoes for today, because I would have done so many, which would have been the vegetable and the chicken curry yesterday so they hadn’t delivered any of it so they just had the fish stars yesterday.” *(Q2-01-C01)*

Some cooks would actively seek ratification from LEA area management before changing the menu:

“usually, if I phone the office and say ‘Look, they really don’t like this meal, what can I do?’ and they’ll tell me then” *(Q4-02-C01)*

although it was more common to rely on published guidelines:

Cook: “I’ll alter the menu to what I know they like within the nutritional thing you are allowed to do. You do know what they’ll eat.”

Interviewer: “Can you do that of your own volition?”

Cook: “No you haven’t got to check, well I don’t check. No you haven’t got to check but it’s just within as long as it’s the right things on there.” *(Q2-01-C01)*

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Whereas school meal uptake was a dominant concern at national and LEA, preservation of school meal uptake was only mentioned by one cook-in-charge.

“I do think we’ve got a responsibility because being a cook, we do the best with the food before it goes out so obviously we want the children to enjoy it and we want to keep children having school meals” *(P01-C01)*

The findings, therefore, suggest that national school meal policy was further influenced by managerial decisions within three other entities at the organisational level – the LEA, the school and the kitchen. Following on from these policy iterations, the data also highlighted a number of instances where it befell individuals to make practical real-time decisions which further influenced policy implementation.

6.2 Professional practices of catering staff and their influence on food availability

The interview data gathered from catering staff illustrates how real-time practices further influenced the food that ended up on the child’s plate over and above national, local and school level policies. These included a range of practical catering decisions made on a daily basis; and, the techniques used by serving staff to actively manage the children’s food choices.

6.2.1 Practical catering decisions

The menu that was actually offered in a particular school on a particular day not only reflected the various policy decisions that preceded it (see Figure 11) but also a range of practical decisions made by the cook-in-charge. These included the quantities of food prepared and served; local menu variations; and, strategies for the display and service of salad items.

6.2.1.1 Quantities of food prepared and served

The decision to offer a choice of menu options would introduce an additional level of complexity regarding the quantities of food to be prepared. This was at the absolute discretion of the cook who would be influenced by factors such as the need to reduce waste; control costs; knowledge of how popular each dish was; and, the desirability of ensuring that the last children to be served had the full range of choices:

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“What I’m doing is one shepherd’s pie which will be enough for 24 and the rest fish fingers in case they won’t take it” *(Q3-01-C01)*

“It’s just knowing by ear that they don’t eat the cobbler. You might serve 10 children with cobbler so you obviously prepare more of the more popular choice which is fish fingers. Otherwise it would be a nightmare and obviously cost wise, we couldn’t prepare the same amount of each in case they all wanted cobbler that day. But once you’ve been in a kitchen a long time, you normally get to gauge what your children like.” *(P01-C01)*

“if they want more, I can anticipate what some children will like a bit more so I put extra on” *(Q2-02-C01)*

“What we do now is, when I’ve got the menu, each day I mark down how much I’ve served, how many children were in and then I’ll write down whether it ran out or tick if it was a perfect amount. All last week we’ve had a resounding success with the choice right down to the last child. It’s very rarely we run out of choice because we’re getting the balance a bit right”

(Q3-03-C01)

“Well today, pepperami pasta cooks for 30 so I sort of split that half each. If I see the pepperami going to all the infants because I have about 16 infants, I’ll sort of stop a little bit, put it away and bring something else out so the choice then for the last class that comes in there is still a choice” *(Q3-02-C01)*

In order to determine catering amounts, a few cooks required the children to pre-order their food:

“In a lot of schools you’ll get the choices out on the hatch at the same time and as they come up they just decide what they want. But I send a list round the day before so that those that have chosen will get what they’ve chosen”

(Q1-02-C01)

“What happens is that everyday our children sign a form to say what they are going have so every day they come in, find what they’re going to have on the menu and then they come to me and I check their name off and then if it’s a

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packed lunch then I give them packed lunch, if it's a hot meal then they go to the servery" *(Q4-01-C01)*

Strict health and safety guidelines stipulated which foods could be refrigerated and re-served on another day.

"There's things that can be used with our guidelines, that can be cooled and used the next day. Normally the meat protein has got to go, we can't reuse that but when it comes to beans and spaghetti, if they're on the menu the next day, you can chill them and they can be warmed and reheated thoroughly and given again" *(P01-C01)*

Although portion sizes were stipulated in LEA guidelines, service staff would use their discretion regarding how much to serve the children. To avoid waste, portions could sometimes be smaller than what was stipulated. Children's requests for larger portions would often be refused to ensure that sufficient food remained available for all.

"We are governed by, we've got potato portioners. Most of the products are sized anyway and we're given a list from our head office saying 'it's 2 new potatoes, a scoop of chips, a spoonful of peas, a ladle which is measured so certain things are... Salads - we normally say 'just fill your little bowl up with whatever you want" *(P01-C01)*

"You know ones that like certain things and, particularly with the puddings, you know who's going to have fruit and who's and it does become, I suppose it's a habit. And you do get to know children who will eat everything so in that respect, if you know they will eat it, you can give them a bit more and then you know, even though there are children asking for everything that they are not going to eat it. *(Q1-02-C01)*

6.2.1.2 Local menu variations

On days where the formal LEA menu stipulated items such as 'vegetable choice' or 'seasonal potatoes', the cook-in-charge would use their discretion as to what was made available.

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“The vegetable choice is left to us so you try to balance it out with what you are giving them so in that respect the choice would either be peas, sweetcorn or sometimes mixed veg” (Q1-02-C01)

Occasionally, seasonal or market variations in price or availability would result in the LEA making a recommendation.

“we’ve got a cost issue so if new potatoes go extortionate which I’m sure potatoes are going to with the weather, then we’ll have a letter from our head office saying this is the better option price wise. You can still put them on but not as often” (P01-C01)

Alternately, some cooks would use their knowledge of the children’s preferences:

“The vegetable selection is peas and sweetcorn. I like to do more sweetcorn than peas because a lot of the kids like sweetcorn and they take it. Some will take peas and sweetcorn.” (Q3-01-C01)

“Well, it all depends what the children like. They do like roast potatoes, they do like new boiled potatoes, they like mash. You know, you just, it all depends what goes with it. If it’s fish cake then the kids will tend to go with mashed potato with baked beans or a choice of vegetables. They don’t like sprouts which I don’t blame them if they don’t like it. They like broccoli, cauliflower, carrots, peas. We do mixed veg, sweetcorn on its own, courgette. There’s all sorts. Like today it’s mixed veg” (Q3-02-C01)

In one case, the cook extended this flexibility with respect to vegetables to ensure they were available every day:

“We can actually choose what vegetable. If you look at the menu [*she gets down the current menu off the wall*]. On Monday there it says sweetcorn and green beans. You’ve got days when there is salad on, there is vegetables on. The next day though, there isn’t veg, there’s salad but there’s no veg, but I put them on. Even though they’re not on the menu I still put them on because if I missed one day of vegetables in this school, I would never have any of them eating vegetables.” (Q3-01-C01)

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6.2.1.3 Salad service and availability

The cook's experience of the children also influenced the strategies used for displaying and serving the additional salad, bread and fruit that LEA policy stipulated. Alternatives included service by cooks and, to a lesser extent, self-service by the children or service by midday supervisors:

“A lot of schools have a trolley out in the hall and the children can go and help themselves, well I personally think it's better on your counter and if you look at a child's meal and it doesn't look very much you can say to them ‘Come on have some salad”
(Q3-02-C01)

Interviewer: Do you always have the three little containers of salad?

Cook: They could be cucumber, tomato, lettuce, carrots. That's there every day”
(Q2-03-C01)

In a few schools, although the free salad was unpopular, it was still made available:

“they'll take the bread but the lettuce and the mixed salad, very little
Sometimes we don't even take the cling film off.”
(Q1-02-C01)

“I do salad, they don't take it”
(Q3-01-C01)

On the other hand, in two of the schools, salad was very popular such that an extensive range of salad items was offered every day which exceeded the amount or variety that the menu intended, sometimes resulting in tensions between the school, the cooks and the LEA:

“We're lucky here in that we've got a salad table. Some schools don't have the opportunity, they only have salads on certain days”
(P01-C01)

“There is conflict very often between county catering and the kitchen in that they say ‘You mustn't serve vegetables and salad'. I've said, ‘Well I'm not happy with this, this might be the only vegetables or the only salad that these children get’.
(Q2-01-SM1)

6.2.2 Active management of food choices

Whilst serving the food, the catering staff (i.e. the cook-in-charge and kitchen assistants who served the food) would adopt a strategy to manage the children's

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choices across food groups/menu categories. Three different approaches emerged from the findings:

a) to assist the child to make their choice whilst leaving the final decision with the child:

“So we’ll try and let them choose what they want but try and get them to take more than one thing. And they are getting better.” (Q3-03-C01)

“when all the rest of them come up, I ask them and some have it and some don’t” (Q3-01-C01)

b) to allow the child freedom of choice:

“A lot of children here don’t eat. Although they are getting what they asked for, they still don’t eat it. There’s quite a lot of waste here.” (Q1-02-C01)

c) to constrain the freedom of choice by mandating what was served:

“...we actually put a portion of everything that’s there on their plate because if we asked them ‘Do you want this?’ they’d all say no and if one said no, they’d all copy, so here we put a bit of everything on” (Q1-02-C01)

Selection of an approach could be influenced by individual child differences, or the popularity of the food group/menu item balanced with its nutritional significance.

“Roast days are not the most popular choice because we do tend to put the vegetables on the plate.... You should try and encourage them to take the whole meal which is a balanced meal that’s been worked out but then, if a child says to you ‘I don’t like the veg and I don’t like the potato but can I have two of the main products’ you can’t do it” (P01-C01)

“On Tuesday.....we will actually give the salad out to the infants because on that particular day, there is no vegetable so by us giving the salad out, each child gets a bit of everything, otherwise they have nothing on their plate”.

(Q1-02-C01)

“Sometimes especially with the roast dinners when they’re having meat and potatoes, you make them have one. They’ve got to have at least 2 items on their tray. We always try to get them to have a little bit of vegetables, even if

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it's only a spoonful of beans or a little bit of beans. Sometimes they eat it, sometimes they don't" (Q4-02-C01)

Preferred approaches tended to reflect the personal styles, beliefs and experiences of the catering staff rather than being specified in any formal policy or disseminated by formal training programmes.

"I get told that my service might be a wee bit slow, I don't care. I've got an hour and ten minutes, to feed 120 children. If I can give them a little bit of conversation, a little bit of encouragement, I don't care if it takes me an hour and twenty minutes" (Q2-03-C01)

"So we've also found that the more we ask them 'do you want it' they actually take it. I'd rather spend a bit longer serving it if they are going to take it" (Q3-03-C01)

"I don't think there is enough interaction. We haven't got the time, it boils down to from that point of view, because we cook for 2 other schools as well, there's not always the time to be able to do those things that maybe you know you should do" (Q4-01-C01)

Thus, in addition to the pragmatic decisions made by organisational managers, school meal policy was also influenced by practical decisions made by catering staff on a daily basis. From a SE perspective, these decisions illustrate the effect upon policy of influences originating at the intra- and inter-personal levels over and above those at the organisational level. A further level of SE influence that emanates from individuals is the reciprocal relationship with the policy level created through pupil consultation.

6.3 Incorporating pupil consultation into healthy eating policy

Pupil consultation in the form of school council sessions was explored to understand its potential as means on strengthening the reciprocal relationship between the policy and intra-personal levels. An unstructured approach was purposefully adopted for this aspect of the study in order to explore *how* the schools conducted the sessions as well as *what* the children chose to discuss.

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6.3.1 Structure of school council sessions

As illustrated in Table 21, all four school councils adopted a different approach to obtain the children's views.

Table 21 Structure of school council sessions

School 1	<p>Council members solicited peers' views prior to session</p> <p>Session lasted 30 minutes and took place during the lunch hour</p> <p>One teacher was present but did not interact with the children</p> <p>Researcher chaired session as a semi-structured group interview</p> <p>Speakers selected by the raising of hands</p>
School 2	<p>Children devised a questionnaire from the original questions</p> <p>Council members completed questionnaires during mini focus-group sessions, one per class, made up of children selected by their teacher</p> <p>Session lasted 30 minutes and took place during teaching time</p> <p>One teacher was present but did not interact with the children</p> <p>Child acted as chairperson to obtain responses to each question in the questionnaire by inviting class representatives to speak</p> <p>Researcher interjected probe questions</p>
School 3	<p>Staff devised a questionnaire from the original questions</p> <p>Council members gathered data during class sessions</p> <p>Session lasted 30 minutes and took place during teaching time</p> <p>The headteacher and deputy were present, commenting on the responses and posing additional questions to the children</p> <p>Child acted as chairperson to obtain responses to each question in the questionnaire by inviting class representatives to speak</p> <p>Researcher interjected probe questions</p>
School 4	<p>Session lasted 30 minutes and took place during the lunch hour</p> <p>One teacher was present but did not interact with the children</p> <p>Researcher chaired session as a semi-structured group interview based on the 3 original discussion questions and additional probe questions</p> <p>Speakers selected by the raising of hands</p>

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Variations included the use of structured questionnaires designed by either the staff (n=1) or the children (n=1); the use of children to canvass views from their peers prior to the session (n=1); and a semi-structure group interview led by the researcher (n=1). All of the formal council sessions and any preparatory sessions where children solicited the views of their peers were talk-centred rather than activity-centred and all adopted a standard meeting format (i.e. using a chairperson and, in one case, the taking of minutes). Three out of the four schools encouraged the council members to canvass, and represent the views of, the wider school. The questions devised by the two schools that elected to use questionnaires are listed in Figure 13.

Figure 13 Questionnaires designed by schools for school council use

School 2 – Questions designed by pupils	School 3 – Questions designed by staff
Do you enjoy school dinners?	Do you enjoy school dinners?
Would you like the vegetables to be crispier/crunchier?	What are your favourite meals?
Do you think that there should be more or less options for school dinners?	Do you think you are given enough choice?
Do you need to be encouraged to eat more of your healthy school dinners? If yes, please explain why.	Do you eat all of your dinner/sandwiches? If you don't, are there reasons for this?
What types of meals do you like?	Do you think it is right to waste food?
Do you think it would be a good idea for healthy dinners?	Have you any ideas that would help children to eat all of their food at dinner time?
Do you think that there should be more or less healthy school dinners?	
What healthy food would you like to have?	
Do you think there should be fewer chips?	
Do you think there should be more vegetables?	
Do you like desserts(afters) or would you want something else instead? What would you suggest?	

6.3.2 Discussion topics selected by children

Having only been given broad questions to consider prior to the council session, the children's self selected discussion areas centred on their perceptions of healthy eating; food availability; and, the food interactions that took place at lunch time.

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6.3.2.1 Perceptions of healthy eating

The dominant themes that emerged regarding the children's perceptions of healthy eating concerned its relationship to the child's physical wellbeing; the desirability of healthy food being available during the school meal; and, beliefs about what constituted healthy food. The children demonstrated an awareness that food was required for their physical wellbeing by using concepts such as 'fitness', 'health', 'energy', 'hunger':

Child: Sometimes I don't think the dinners are healthy enough (FG1)

Child: [Squash] is not as healthy as water. (FG3)

Interviewer: Why is it important that you eat all of your dinner?

Child: You get energy.

Child: To be fit.

Child: You won't be starving when you get out. (FG1)

Child: They aren't getting enough energy and things like that

Interviewer: Why do you think that's important getting energy?

Child: Because you get tired in the day (FG4)

The desirability of school meals being 'healthy' featured in three of the eleven questions that the children in FG2 incorporated into their questionnaire (see Figure 13). Responses indicated that 97% of the children thought healthy schools meals were a good idea but only 55% wanted healthier food at lunchtime. Similarly, over the course of the session, FG4 reached a consensus that children should eat healthy food and that eating 'bad' foods was 'wrong' but their preference was to carry on eating what they currently ate. In contrast, FG2 felt that healthy food was something they would accept in moderation alongside food they liked:

"Instead of just changing like the meals completely, some people don't like all the healthy things, you can have little bits of bad food and little bits of healthy food" (FG2)

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A child in one school, who was quite outspoken throughout the session, clearly disliked healthy food and blamed Jamie Oliver for what she perceived was a decline in the food on offer. Some, but not all, children agreed with her view:

Child 1: It's too healthy stuff. Before Jamie Oliver we used to have nice stuff.

Children: *general laughter*

Interviewer: What food did you have before Jamie Oliver that was nice that you don't get now?

Child 2: It's the same.

Child 3; Beefburgers, chicken chunks, chocolates.

Child 1: We have chicken chunks and potatoes - ugh!

Child 4: We never had salmon.

Child 1: They do potatoes with everything.

Child 5: We've always got the choice of salad or vegetables.

Child 6: Rice with vegetables.

Child 1: It always used to be chips or beans or peas. (FG4)

Dimensions of healthy/unhealthy eating included food groups (e.g., fruit and vegetables), cooking method (e.g., frying), food additives (e.g., colourings in fruit squash drinks) and moral issues (e.g., not wasting food or the money and effort associated with preparing it).

Interviewer: Why do you think tomatoes are healthy?

Child: Because they are in salad and if you have salad you see tomatoes (FG2)

Child 1: Chips are not good for you. Chips have lots of fat.

Child 2: They're actually potato wedges which are a bit healthier than chips.

Interviewer: Why are they healthier than chips do you think?

Child 2: Potato wedges because they cook chips in lots of fat and with potato wedges all you have to do is cut them and cook them (FG2)

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“In the squash there might be additives or colours” (FG3)

“It’s basically the cooker’s, the chef’s job to make something and they’ve made all the effort but you just chuck it away” (FG4)

Some misconceptions about healthy eating were also expressed by some children during two of the school council sessions:

“Fruit is not healthy if you keep on eating the same one because fruit has got sugar in as well.” (FG4)

Interviewer: Some of your friends thought that ice cream and cheese was healthy

Child: Ice cream and fruit and cheese and chips (FG2)

6.3.2.2 Food availability during school meals

Food availability dominated the discussions of each school council. The major themes that emerged were: a) the range of choices available; b) suggestions for additional foods required; and c) perceived issues regarding food availability.

The range of choices available

The children spoke about school meal ‘choices’, using the word as a noun, rather than a verb, and generally agreed that school menus should include more ‘choices’ to ensure greater alignment with individual likes and dislikes:

“You should have a bit more choices because some people are fussy and they don’t like the food that they have” (FG4)

Class Rep1: They’d like 3 options as well because we’ve got 2.

Class Rep2: Children in our class don’t think there is enough choice.

Class Rep3: Have more choices.

Class Rep4: Do you think that you are given enough choice? They all said no

Class Rep5: They haven’t got enough choice. (FG3)

In contrast, too much choice was also an issue for some:

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Interviewer: When you have dinners at home, does your Mum give you a choice?

Group: No

Interviewer: But when you come to school you have to choose. Is that easy or hard?

Child: It's hard because if you have, I like creamy chicken pasta and you have something else I really like it's hard to choose, it can be, it's hard to choose them both (FG1)

In one school (FG1) the lack of choice for vegetarians was raised as an issue several times during the course of the session. However, this was primarily the view of one outspoken child and her peer group rather than a group consensus:

Child: "I'm a vegetarian and most of the time I get the vegetable bake and I don't like it so I end up having the potato and then they say have some salad and then I have salad but then all I've had is tomato and the potato."

Researcher: "So what is wrong with that do you think?"

Child: "Well I asked some of my friends and they all said there wasn't enough vegetarian options." (FG1)

Suggestions for additional foods required

There was less agreement regarding what additional food should be available. Suggestions included healthy food, foreign food, pasta, chips, vegetables, chocolate cake and coloured custard:

"One of the classes said we should have more variety like from different countries" (FG1)

Interviewer: What healthy food would you like to have?

Child 1: Salad, potato, pasta.

Child 2: Carrots, salad and jacket potato.

Child 3: Salad, lettuce, carrots, tomato, cucumber

Interviewer: So your friends really like salad and they want more and more of it.

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- Child 4: Most of them they want more healthy stuff so they said noodles, carrots, pasta, chicken
- Child 5: Salad, melon and cucumber.
- Child 6: Jacket potato, salad, cheese on toast, fruit salad, jacket potato, fruit, ice cream.
- Interviewer: That's a huge list and that's for healthy food. Some of your friends thought that ice cream and cheese was healthy.
- Child 6: Ice cream and fruit and cheese and chips. (FG2)
- Child 1: I think we should have different coloured custard.
- Interviewer: Why do you think that would make a difference?
- Child 1: Maybe it would make people want it a bit more.
- Child 2: Because some people don't like custard. (FG1)

Three groups suggested that additional flavourings could be made available (ketchup, mayonnaise, salt, salad dressing):

- Child: "To have ketchup and mayonnaise and stuff because people don't get ketchup with their fish fingers and chips." (FG1)
- Child 1: "Some said brown sauce and mayonnaise. Salad cream instead of just having like the same thing."
- Child 2: "Some people said salt and vinegar and pepper." (FG3)
- Interviewer: "Some of you are saying salad and pulling a little face. What's the problem with salad?"
- Child 1: "It's the tomatoes."
- Child 2: "They put no dressing on it or nothing."
- Child 3: "I don't like any salad. It's too dry."
- Child 4: "Yeah dry." (FG4)

Perceived issues with food availability

A number of themes emerged regarding the children's issues with the food available. These included their reasons for not selecting the food; food running out during service; and, alterations from the published menu. Reasons for not selecting the food

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on offer included unfamiliarity, appearance, lack of alignment with their food preferences and food quality:

“Children sometimes don’t eat it because they don’t really have real food, they have different food and they’re not used to the food at school” (FG4)

“They’re eating with their eyes. They just like looking at it. You never know when you taste it, it might even look better” (FG4)

“Because sometimes it’s like nothing they want there and they don’t eat it because they don’t like it” (FG1)

Two groups expressed concerns over food quality such as mashed potato being reconstituted from powder²¹, hairs in food, green lumps in custard and undercooked chips.

Child: Some people say they mash it but it’s made from powder and water

Interviewer: Is it!

Child: Some people say it is.

Interviewer: Would that not be nice then.

Child: No

Interviewer: What should it be made from do you think?

Child: I think it should be real mash. (FG1)

“Well, my sisters, when they used to be in this school, they went into dinners to try it but they both came home saying that the food wasn’t cooked properly and they didn’t like it, they thought that were going to be sick but my Mum said that they said that, I think they had chips and vegetables then, that the chips wasn’t like fried properly” (FG3)

Children’s views about the quality of the food influenced the popular perception of the school meal and, indirectly, uptake or consumption:

²¹ Subsequent interviews with cooks confirmed that this was the case

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“Some people around the school go round telling people that the school dinners are made from stuff that they’re not and it kind of puts people off”

(FG1)

Even if the children selected the food that was available, sensory attributes such as taste, smell or texture could then discourage its consumption:

“It doesn’t taste nice”

(FG1)

“They’re cooked for too long I think because sometimes, especially the sprouts, they’re all soggy.”

(FG2)

“The food is dry and the gravy is watery”

(FG3)

Some issues that were raised regarding with food availability were more associated with the service itself than menu content. These included food running out which meant that the last children to be served only received a limited choice:

“A lot of the time the infants, there’s something on the menu - we choose a day from school dinners to have it and then the infants get it and it’s run out when we get there”

(FG1)

Interviewer: “Those of you that come in last for school dinners, do you get a choice then?”

Group reply: “Noooooo”.

Child: “No, and it’s cold as well.”

Child: “You get not a very good choice and it’s cold.”

(FG2)

“Some people would have wanted that thing and then it would have all gone to waste and then it’s on other people’s plates and they haven’t ate it”

(FG3)

Suggested solutions included not allowing infants menu choices so that they couldn’t ask for food they then wasted, thereby making it available for older children, and, pre-ordering food:

“When the prefects bring the dinner register round, when you open it, there should be like a sheet, like what the cooks are making today. If they have like salad or fruit they should say what’s in the fruit and if they’re oranges, say whether they are satsumas”

(FG3)

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The availability of desserts was particularly controversial in that some children were aggrieved by the advertised menu being changed and others by highly-valued but non-advertised items such as cookies or yoghurts not being available to all:

“Sometimes on dessert there’s not a lot of things you can choose from so I end up just having like fruits” (FG1)

“In year 6 they said when they’re serving desserts with your food, they should all be put out at the same time because sometimes you’ll go in for your dinner and it would only be like one type of cookie there and another class would come in, they would get different types of food and cookies” (FG3)

The substitution of fruit squash drinks by water was resented, as was the mandating of portion sizes (too much/too little) and fixed menu combinations (e.g., not being able to have pasta and potato):

“You have to have 3 fish fingers not just one which is too much when you are learning to like fish” (FG1)

Interviewer: “Does anybody know why perhaps you might not be given too much squash?”

Child 1: “Because it’s not as healthy as water”.

Child 2: “Some squash got sugar in it.”

Child 3: “It might cost more money.”

Child 4: “Squash, sometimes it can be unhealthy for you like.” (FG3)

6.3.2.3 Food interactions during school meals

The main dimensions that characterised the interactions that took place during the school meal were: a) midday supervisors’ use of feeding strategies and imposition of food related norms; b) the influence of peers; and, c) the influence of the environmental context.

Feeding strategies and the imposition of food related norms

The children were aware that midday supervisors would subject them to certain feeding strategies, for example, being pressurised to eat their food and that eating their food was a pre-requisite for obtaining a sticker.

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Child: They say like just have this little bit and then you can go out, just have that one bit.

Interviewer: Why don't you like it when that happens?

Child: Well sometimes, you've ate a lot and you can't eat any more.

(FG2)

Child 1: Yes they say 'try that it's lush', 'fish makes you brainy' and 'carrots make you see in the dark'.

Child 2: They just bribe you *(FG4)*

Although many older children did not want to receive stickers, some were proud to receive them and one child appreciated the autonomy of being able to decide whether to forfeit a sticker in return for being allowed to leave their food.

Interviewer: Do you get stickers a lot?

Child: I get some sometimes but not all the time.

Interviewer: Is that because sometimes you don't eat your dinner?

Child: No

Interviewer: And when you do get one, what does that make you feel like?

Child: It makes me feel happy. *(FG2)*

Child: Yes I like having stickers because it's better than them just telling you and also, they reward you for what you have eaten and they also tell you just eat some more of that.

Interviewer: So they are not trying to make you. So you've made up your own mind

Child: Yes *(FG2)*

In addition, many children had their own 'strategies' for avoiding having to eat the food:

"Sometimes people get something to try it and then they try it and they don't like and they squish it to make it look like they've eaten it" *(FG1)*

"A few of the infants throw things on the floor without them knowing to make it look like they've eaten more." *(FG1)*

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The children were also aware of various school meal norms such as eating the main course before dessert, putting hands up to receive attention and the availability of seconds:

“In the infants when I was in it you had to put your hand up before you had your pudding and then the Miss came and saw how much you’ve ate” (FG1)

Child 1: We have to ask if we can have our dessert.

Child 2: You can ask in the juniors but you don’t have to.

Child 3: You don’t have to ask in the juniors but you have to ask in the infants.

Interviewer: Who told you when you first started school you had to ask?

Child 3: The dinner ladies.

Interviewer: And is that OK?

Child 3: So you don’t eat your afters and then not eat your main meal.

(FG2)

“You’ve got to say, ‘can I have my afters now?’ and he [previous headmaster] says just have like a spoonful or a forkful more of peas. You have to do that. We don’t do that any more though”.

(FG4)

Child reported peer influences

Some children were reported as being influenced by their peers (e.g.) regarding their food choices or decisions to leave their food and go out to play:

“Some people rush their food because they want to get out and like, because if you have a best friend and they’ve finished you want to eat very quick and then you just, if you eat very quick you don’t really want anything else.” (FG1)

“Sometimes like they have a best friend and he picks a meal and sometimes you don’t really like it that much and sometimes they copy and they’ll have the same as them”

(FG2)

Interviewer: If you saw that everybody was eating banana or grapes, does that make you want to eat it even more?

Children: *Multiple yeses.*

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Child 1: If other people are eating it then you can ask them if it's nice and stuff.

Child 2: If you're hungry (FG4)

The influence of the environmental context

The children articulated differing associations with food and eating behaviour according to the context in which eating was embedded. Eating at home was associated with mothers, familiar food and freedom of choice:

Child: It's like when they do it they've got like different vegetables that people probably have at home like carrots and cucumber and here they have like broccoli and lentils and stuff.

Interviewer: What's the problem with broccoli and lentils?

Child: It's just a change for people basically. (FG4)

Interviewer: Do you find anybody that the food you have for school dinners is very different to what you get at home?

Children: *Multiple yeses.*

Interviewer: Is it better or worse?

Children: *Multiple 'worse's.*

Interviewer: So you all like your Mums' cooking.

Children: *Loud yeses.* (FG3)

In the school context, the lack of time to eat was raised on nine separate occasions by different children in one school. For example:

"Twice this happened to me because, once, we'd just gone in and it was like near the end of playtime and like soon as I got out the dinner ladies were saying come on, come on and we only had one minute to eat the rest of our dinner. So I was eating and then because I liked it and I didn't get to eat as much as I wanted to so for the rest of the day I was hungry" (FG3)

Solutions such as sending two classes in to be served at a time were suggested. In addition, the following extract from a discussion in FG4 shows how the group perceived eating in secondary school, revealing tensions and disagreements regarding preferred versus healthy foods:

Child 1: They have chips and things

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- Child 2: Yeah, nice stuff
- Child 3: They have like sandwiches. They have a sandwich bar and you can have chips and burgers and things like that
- Interviewer: Can we put hands up and have a vote. Put your hand up if you think it's better (*most hands go up*)
- Child 4: It has all pop in it and chocolate and it makes your teeth bad
- Child 5: It's worse food up there. It tastes better and its worse for you
- Interviewer: So what does everybody think, better or worse for you?
- Group reply: Worse.
- Child 2: It's better than primary school. It's healthier

The findings thus far have focussed upon how children's eating behaviour is influenced by organisational level processes associated with policy implementation. A further category of organisational level influences on eating behaviour takes the form of the environmental characteristics of the school dining hall.

6.4 Environmental characteristics of primary school dining halls

The dining hall observations supplemented by interview data revealed that the school dining halls comprised of two distinct environmental contexts that influenced different eating behaviours: the service area where children made their food choices; and, the dining area where children consumed their food. There was minimal overlap between these contexts in terms of Spradley's dimensions of the social scene and their inter-relations (1980). Consequently, each will be reported separately. A third context – the kitchen where catering staff prepared food and cleared up – falls outside the scope of this study as it had a less direct influence on the children's eating behaviours and the activities largely took place outside the lunchtime period.

6.4.1 The service area and its impact on food choices

Some of the physical, temporal and social characteristics of the service area had minimal impact upon each other. These will be reported first, followed by those characteristics that *interacted* to have a direct influence on the children's choice activities. Throughout Section 6.4, where physical/temporal/social characteristics are reported as 'interacting', these are interpretations emerging from the data analysis.

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6.4.1.1 Physical characteristics (space and objects) of the service area

The physical characteristics of the service area included the space it occupied and objects located within it – including the food that was served to the children.

Characteristics of the service area

The service area was either a service hatch which opened out onto the dining hall from an onsite kitchen (n=10) or a series of static service trolleys within the hall (n=1). Occasionally, some food (e.g., desserts or salads) was served from trolleys in the main hall in addition to food served from the hatch. Two schools had self-service salad bars. The main course and dessert were served together on plastic ‘flight trays’ which were green for infants (age 4-7 years) and yellow for juniors (age 7-11 years).

Interviewer: Do [you provide] the green and yellow flight trays?

Manager: Yes, we provide all that. Horrible things.

Interviewer: Yes, but how else are you going to serve the children?

Manager: Because they can't go up twice.

Interviewer: And also, because they are not hot the food is going cold quite quickly and they are slow little eaters

Manager: Exactly and I haven't got an alternative. *(LEA-03)*

Brightly coloured plastic cutlery was the LEA standard, but one school had retained its old stocks of metal cutlery. During formal interviews and conversations that took place during the observations, some staff reported that plastic cutlery was highly valued by the children. For example:

Interviewer: Have you ever had metal cutlery in this school?

Headteacher: A couple of years ago.

Interviewer: Plastic cutlery is.....

Headteacher: It's a county initiative really.

Interviewer: But it is very difficult to use.

Headteacher: There were some accidents with older children back a few years ago and consequently then because of the danger side of it, I know it's sad, but when you have a knife there's danger isn't there? Children mess about with them. *(Q3-01-FG01)*

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Thus, the school eating experience was potentially different from other contexts where, for example, conventional plates and cutlery may be used.

Food quality

The quality of the food leaving the servery was regarded as important by catering staff. Those directly or indirectly involved in its preparation took pride in their achievements, and sometimes tasted the food they served:

“First of all it’s the quality of the food without any doubt, the nutritional balance and all that stuff. Then, if the food is appealing and is made in a way that the child would like to try” *(CONT-02)*

“I’m not sure where this came from, a misnomer that a lot of the food used in our school meals is bought in and it isn’t. We’ve prided ourselves on maintaining recipes and the skill for people to cook those recipes” *(LEA-03)*

“We have a meal after, we have exactly the same as what the children have so I know if something tastes good. I taste these things.” *(P01-C01)*

However, not all would agree that all the food looked appealing, as the focus group data (see Section 6.3.2.2) and this extract from an interview with a headteacher illustrate:

“There are still certain things on that menu that I don’t think should be there, like that pizza. They make their own pizza which is fabulous but they also make that pizza where they use like a half a roll for the pizza base and they’re disgusting. The children don’t like them and they look at me and I say ‘Well I wouldn’t eat it either’. You can tell that to the older ones. They go ‘Miss’ and I say ‘well I wouldn’t eat it either’ and once you say that they think ‘thank god’ you know” *(Q2-01-SM1)*

Not all schools could cook fresh food due to limitations within the kitchen facilities. Some entrées, for example, curries were purchased pre-prepared and reheated. The use of tinned and frozen food was common in all kitchens. Where practical, some food was freshly prepared during service:

“You batch cook certain things, you’re always part frying the chips ...just as a wastage thing really and then everybody has something that’s, I mean you

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don't want chips that's been If you're a junior and you're coming in at the end of the lunch sitting, you don't want anything that's been sat under the hot especially chips and things like that, potato products.” *(P01-C01)*

Tasting the food was not part of the observation protocol. However, most serving hatches looked pleasingly laid out even though this was often irrelevant as the smaller children were not tall enough to see what they were selecting. The offerings generally adhered to the menu which was child-centric and akin to the child menu offered alongside adult menus in restaurants (e.g., fish fingers, cheesy wheels, chicken nuggets).

6.4.1.2 Temporal characteristics (time periods and events) of the service area

The temporal characteristics associated with the service area related to the time available to serve the children, and the strategies that were used to manage the throughput of children (e.g. the use of sittings). Food service commenced at approximately midday and lasted for 45-50 minutes. However, one school shared a dining hall with a nearby school, and was allocated 30 minutes for lunch, 15 of which were used to serve 75 children. A critical temporal feature was that a mass of children, as defined by the level of school meal uptake, required serving as close to the commencement of lunchtime as possible. Therefore, throughput strategies were needed to control the flow of children to the service hatch. In schools where only one dining hall was available (n=10), service was in two sittings, one for infants and one for juniors. The gap between sittings varied and was often imperceptible, marked only by a switch between green and yellow plates. All schools currently served infants first, although one headteacher reported that their school had served juniors first in the past. Throughput strategies were usually devised by the school:

Interviewer: If there's multiple sittings, is that designed by the Headteacher or the caterer?

Manager: The headteacher. We have some influence occasionally which will be negotiations with the cooks and the area managers that they're not getting the numbers through or they've not got the time so they'll negotiate with the headteacher but it's generally the headteacher. *(LEA-01)*

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Strategies varied by school, for example, sending children up table by table or calling them in from the playground or classroom, class by class:

“the Year 3s come straight into the hall from their class. They do not rotate the years. The cooks main concerns is that there is always a pipeline of children there to serve and the supervisors try to achieve this even if they have change the class order temporarily” *(Q1-02-S04)*

“The reception, year 1 and year 2 go in at more or less the same sort of time starting with reception and then at 12:10, year 3 and 4 come in, at 12:20 another year 4 group and year 5 come in and at 12:30 the oldest ones come in” *(Q3-02-SM1)*

“The juniors are fed into the hall in order of age (year 3,4,5,6) and the cook uses a tannoy system to call the classes in from the playground when she can see that she has no queue.” *(Q3-03-SM1)*

6.4.1.3 Social characteristics (actors and activities) of the service area

The principal actors in the service area were the children receiving school lunch and catering staff. Catering staff were mostly female, although, on the day of the study, one school had a male kitchen assistant who was a temporary agency worker covering sickness absence. Ages varied and most were mothers or grandmothers. Catering staff were employed by the LEA. Many had several years' service and it was common to have over 20 years service but, paradoxically, LEA managers reported that catering staff could be difficult to recruit. School specific staffing levels were related to the number of meals served:

“That's set by the local authority. We have a number of children. It's all based on the amount of children that we serve every day. I don't know how they work it out. There'll be so many children having lunch and then they allocate us our hours. They cut our hours if my numbers drop below a certain number then obviously labour hours have got to go as well so that's chopped and changed according to your numbers. We're very lucky here, our numbers stay quite stable all year. Lots of schools will drop right off in the summer. We

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haven't had a very good summer so if they cut hours obviously you've got less time to do anything." *(P01-C01)*

Table 22 represents a comparison between the attributes of catering staff and midday supervisors.

Table 22 Major attributes of school meal staff

COOK/KITCHEN ASSISTANT		SUPERVISOR
Full working age spectrum	AGE	Full working age spectrum
Mostly women, often mothers	GENDER	Mostly women, often mothers
As a group within a school	SENSE OF IDENTITY	As a group. Uniforms sometimes worn. Tend to associate with kitchen staff Can be marginalised from school life
With supervisors and each other	TEAMWORK	With cooks and each other
Often very long (10-20 years)	LENGTH OF SERVICE	Sometimes very long, 5-10 years not uncommon
Varies from rule bound to making informed changes for the best interest of the children	SENSE OF EMPOWERMENT	Personal ways of working common Some schools allow a high degree of autonomy
Pride in work and sense of reward	JOB REASONS	Desire to work with children, help the school Convenience based on personal circumstances Some have multiple jobs
No influence beyond the servery ^a	FRUSTRATIONS	High feelings of job satisfaction Staff shortages and time pressure main concerns
Poor eating skills from home		
Children known by name	NAMES	Children known by name
Children often address staff by forenames		Children often address staff by forenames
Individual likes/dislikes and eating behaviours	CHILD KNOWLEDGE	Individual likes/dislikes and eating behaviours
Only occasionally problematic	RESPECT FROM CHILDREN	Sometimes problematic
Low	AWARENESS OF POTENTIAL	Low

^a Some will go into the eating area to encourage the children to eat. Others have strong views that this is not their job

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The activities undertaken at the service point were specific to each category of actor. The catering staff served the food. The children queued for lunch and then selected their food. Queuing was an experience characterised by waiting, expected codes of conduct and breakdowns of discipline. Some schools also used older children to hand out drinks or cutlery; teaching staff to assist infants with their choices; or, midday supervisors to assist with serving.

“One of our dinner ladies does our sweet trolley which is a great help. We haven’t got a very big hatch. If we had a bigger hatch we could have a sweet on the end and we’d serve them that way. Most schools are the same”

(P01-C01)

“You’ll notice that quite often the class teacher will go down there as well and the teaching assistant will certainly go down there and they’ll make sure their hands are washed and everything and that they go into the hall and that they’re choosing food and they’re OK getting to the table and they’ll stay with them while they’re starting to eat”

(Q3-02-SM1)

Table 23 shows a comparison between the roles of catering staff and midday supervisors which mostly relates to the degree of formalisation/structure within the role, for example, formalised job descriptions and access to training.

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Table 23 School Meal Staff - Profile of role

CATERING STAFF		SUPERVISOR
Yes	FORMAL JOB DESCRIPTION	No Some schools draft their own Individual perceptions of what role entails
Difficult	RECRUITMENT	Exceptionally difficult Widespread shortages
Available via the LEA	TRAINING	Uncommon Mostly in behaviour/ playground management
27.5 per week (cook) variable (kitchen assistant)	HOURS	Cover the lunch 'hour'. Rotas common.
Clearly defined by the LEA	MANAGEMENT STRUCTURE	Less defined or non-existent Some meet with headteacher Unofficial playground meetings common

6.4.1.4 The influence of the service area on food choices

Food service by adults and food selection by children was an interactive event influenced by the physical, social and temporal characteristics of the situation. Each server took between 13-60 seconds to serve and interact with each child (see Table 24). In three schools, this was the maximum time allowable given the length of the lunchtime and numbers taking school meals. In the others, more time was available if required and so the service time reflected how long the servers allocated to the task. Serving staff were expected to engage in 'marketing' which was a formal term for strategies accompanying the act of serving intended to promote the food on offer. (The strategies used are detailed in Section 7.3.1). The quality of this interaction was constrained since the service hatches or mobile food trolleys were too high for the smallest children to see the food on offer and formed a physical barrier between the server and the child. Nevertheless, this period of social interaction was a naturally occurring opportunity to influence the children's choice behaviours.

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Table 24 Time spent serving children

Meals	Servers	INFANTS		JUNIORS	
		Time/server ^a	Total ^a	Time/server ^a	Total ^a
Schools where no constraints influenced the time spent serving:					
122	2	24	48	28	56
91	2	25	50	23	46
100	2	28	56	29	58
106	2	25	50	25	50
100	2	37	74	16	32
121	3	28	56	14	28
45	1	60	60	60	60
93	3	16	48	16	48
Schools where time was the maximum permitted by time/uptake constraints:					
75	3	13	39	13	39
225	3	16	48	16	48
179	3	17	51	17	51

^a The average time spent serving each child in seconds

6.4.2 The dining area and its impact on food consumption

The dining context differed from the serving context in that most of its physical, temporal and social characteristics tended to influence each other rather than existing as discrete features. On the other hand, the two contexts were similar in that the children's eating experience and their consumption behaviour were influenced by interactions between certain physical, temporal and social characteristics as was seen with the choice behaviours at the serving hatch.

6.4.2.1 Social actors within the dining area

In the dining area, 'actors' was the only category within Spradley's Descriptive Question Matrix (1980) whose characteristics were not influenced by the others. As well as the children taking lunch, the actors included midday supervisors, teaching assistants, teachers, children acting as monitors, and, in one school, the caretaker and handyman. The dining area was one that catering staff could not, or would not, seek to influence:

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“Here it’s difficult because if you haven’t got midday supervisors out with them to encourage them to eat, because we can serve and if they don’t want anything we can say ‘Oh go on, try a bit of this’ and they say yes, but unless there’s somebody out there” (Q1-02-C01)

“We’re not employed to be out in the hall as supervisors” (Q2-01-C01)

“The kitchen staff themselves find it very frustrating that they can’t have any influence beyond the servery. They are aware that meals they have cooked can just be thrown away and that a lack of basic cutting skills can make it difficult for small children”. (LEA-99)

Midday Supervisors

Midday supervisors were mostly female, although one school had a male midday supervisor who was also the caretaker. As with the catering staff, their ages varied, most described themselves as mothers or grandmothers, and many had several years’ service. Headteachers agreed that the role of midday supervisor was difficult to recruit, particularly in the higher socio-economic areas.

“It’s very difficult to get lunch time supervisors. Not only for this school but for other schools in this city but particularly here. People don’t want that kind of job. Some of them come from outside the area but it’s very difficult to get. We try and get the mothers, all of those we have at the moment are ex-mothers or current mothers. That’s how we recruit. It’s seems that we recruit by twisting arms a little bit. It’s that difficult” (P01-SM1)

“It’s a huge issue in this area. I have a constant advert out, I’ve tried local shops. I’ve tried everywhere. I’ve tried the parishes and no-one wants to do it. It’s an hour in the middle of the day. They’ve got enough money. It’s not worth them doing it and it’s a huge issue here. A huge issue. We are always running chase our tail here” (Q1-02-SM1)

A possible consequence of this is that midday supervisors were perceived by some as a powerful group:

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“The schools are frightened of a range of people who are key workers I suppose. So basically, the caretaker, the school secretary, the midday supervisors and the cleaners usually scare the pants off the schools. For some reason, I can never figure and have a real influence because when things go wrong in those quadrants it can really disturb the school day” *(LEA-03)*

“They’re there for an hour, hour and a half maximum, they need training as well which is a huge issue but you can’t force people to be trained can you when there’s such a shortage” *(Q2-01-SM1)*

A comparison between the attributes of catering staff and midday supervisors is illustrated in Table 22.

There is no legislation covering how many supervisors are required per child. An employee within the LEA recalled that the Welsh Office published guidance in 1994/96 stipulating that the supervisor:child ratio for juniors was 1:40 but could not recall what the ratio for infants was, other than that it would be lower, possibly 1:25-30. Staff levels were based on local risk assessments and concerns for health and safety rather than concerns over health from a nutrition point of view. Most schools were short staffed. For example, in one school, midday supervision was done by teaching assistants and the headteacher. Another had declined to participate since it had no supervisors and was relying on parent volunteers. A critical factor when setting staff levels was adequate supervision in the playground:

“We work on a ratio. We currently work on 6 or 7 depending on which day of the week it is. Some are part time and some are full time. There’s always an argument to have more. On a nice dry day we could get away with about 5 dinner ladies but when it’s wet play, that’s when it becomes really difficult. We need supervision within the terrapin classrooms. If I could have another dinner lady we would employ one but as I already intimated, it’s difficult getting hold of people that are prepared to do this.” *(P01-SM1)*

“We’ve got 2 play areas and we need to make sure that both of those are supervised adequately.” *(Q3-02-SM1)*

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Four schools catered for special needs children who had dedicated supervision, sometimes on a one-to-one basis.

Absenteeism exacerbated the problems resulting from recruitment issues but was largely 'tolerated' by the school management for fear of alienating staff. Nevertheless, it created problems for both headteachers and other supervisors²²:

"Eight supervisors are used at present but realistically 6 would suffice. The additional two are to increase the likelihood that on any day, 6 will turn up for work. If supervisors do not turn up they do not get paid." (Q3-03-SM1)

"There's one dinner lady that only seems to turn up when she wants to and it used to throw the rotas and things out of the window. We did another rota including everybody, like what do you want to do, what do you want to do and we did it that way, but again, when dinner ladies don't turn up, the rota goes out the window, we need to go where we are needed." (Q4-02-S03)

Midday supervisors were employed by individual schools and it was rare for them to have a written job description or training (see Table 23 for a comparison with the job profile of catering staff). Previous training related to behaviour or playground management rather than dining hall activity and was arranged and paid for by schools who felt that they could not mandate attendance. Consequently, many supervisors relied on their experience as mothers whilst encouraging the children to eat:

Supervisor: "I'm a mother as well so it's a motherly thing in me you know".

Interviewer: "Yes. Do you think that it is your instincts that lead you to do what you do when you go round [the tables]?"

Supervisor: "Yes. I'm a mother of 3 children and I work with children. You've got to make sure they eat. But if they don't like it I make sure they have a dessert or eat a bit of it.....The teachers'll say, they're quite good, they'll say 'oh you need

²² Prior to the adoption of telephone interviews, three midday supervisors who had agreed to face-to-face interviews were absent on the days of the observation.

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to cut it up' or, you know, but to me that just comes natural.” *(Q2-01-S01)*

“I think all the little ones are the same aren't they so if you can see what they're like at home. You know, as far as my little one goes, probably all his friends are the same so I would try and encourage them just to take something and try a little bit more and eat a little bit more of it”

(Q3-03-S01)

During observations, midday supervisors appeared marginalised from the main school in that they arrived and left promptly and almost unnoticed at the start and end of the lunchtime, often via rear entrances. They were also perceived as such by two of the three LEA managers that were interviewed:

“They're out on a limb really and I'm sure if you sat down with a group of supervisors, they'd probably feel out on a limb. They're not part of the school but they're not part of the kitchen” *(LEA-02)*

“They're like wraiths aren't they?” *(LEA-03)*

Some schools attempted to integrate supervisors by inviting them to attend lunchtime management meetings, special assemblies, school concerts, or possibly to sit on the school's governing body.

“We all go in the staff room or one of the other rooms and then the head and then we all sit down together and then she always asks how we are getting on, and the children and things like that. Any more ideas and yes, we all talk together, yes” *(Q1-02-S01)*

“One is the parent-governor. Actually, she is a bit different, she is also our caretaker. She's caretaker and dinner supervisor, she comes in to hear children read as well. She's very active. She's head of our PTA so she's very involved.” *(Q4-02-SM1)*

“I think before, they felt separate from the school and hopefully this involves them a bit more like for example we leave the newsletter out there for them to pick up because if they haven't got a child in the school, you

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want them to feel a part of it, and the welcome board - they didn't know what was going on in the school sometimes so we put the welcome board now which they can see which classes are out, who's in" (Q1-02-SM1)

In general, they seldom interacted with anyone but the children, except on playground duty where they often chatted to each other:

"I wouldn't go out of my way. I mean I talk to the girls in the playground but I wouldn't go out of my way to go and see the head." (Q2-02-S03)

Some schools allocated supervisors to either infants or juniors, which meant they worked different hours. The pleasure most took from engaging with the children was noticeable and many spoke of the desire to work with children as being their motivation for doing the job.

"I love being with the children. I've got to leave about half past 11 because I live in to get to work and I drive anyway so it's OK, yeah, I think it's the children. I just like being there" (Q1-02-S01)

"They're very loving and I just like being with them over there. The children are nice. I mean they all have their days but on the whole, they're pretty good" (Q2-02-S01)

Another common reason was the convenience of working patterns that suited family life, i.e. short hours and long holidays.

"It was easy for me because mine were small and were in school and I was off with them" (Q2-02-S03)

"The convenience. I've got children in school so holidays I'm home, well the majority of the holidays, there might be the odd inset day that I'm off or my little boy isn't or whatever." (Q2-02-S04)

Teaching Staff

With respect to teaching staff, some headteachers actively engaged with lunchtime activities, others did not. There was usually a duty member of staff overseeing the dining hall.

"I'm on lunchtime duty every day, sometimes it means I'm in the hall, sometimes it means I'm outside. Sometimes I'm dealing with behaviour

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issues or children that have fallen over. But I'm on lunch time duty every day”
(Q2-01-SM1)

“I have 2 members of staff that are also doing lunch time duty as a matter of course and that is just trying to keep the children safe basically”

(Q1-02-SM1)

Other than the duty member of staff, it was rare to see teachers in the dining hall unless they were collecting their own lunch, and even less common to see these teachers interacting with the children. Exceptions to this were teachers of the infants classes who would oversee their own class whilst they were being served. One school required teaching staff to supervise the children whilst they were eating.

Interviewer: If you had the maximum amount of supervisors would you still use teaching staff in the dining hall?

Headteacher: Yes

Interviewer: Do the staff accept that because they are almost sacrificing their own dinner time.

Headteacher: We tend to take reception children in ten minutes before, we lose ten minutes classroom teaching
(Q2-01-SM1)

However, these teachers tended to stand by the tables without much interaction, other than with each other. It was more common to see teaching assistants undertaking supervisory duties in the dining hall, especially in schools where there were special needs children.

“We do bump it up by using our teaching assistants as well and they support the children during lunch time as well and we do have quite a large number of children who've got special needs so if they've got a member of support staff that's designated to them obviously they're keeping an eye out on those children as well so there's a lot more informal supervision going on as well as the formal midday supervisors role which is specifically for that. But part of that obviously, you're basing that on goodwill of staff as well as a certain amount of direction “
(Q3-02-SM1)

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Children as monitors

In some schools, children were used as monitors to assist with some of the supervisory duties. Tasks assigned to monitors included handing out cutlery and drinks, helping younger children to their seats or leading them out to the playground after eating.

“They look after the cutlery. They look after drinks, they also look after supervision and also supervise the children when they are scraping the food on their plates away. As the children get to year 6 we try to give them a bit more responsibility, it’s good training for them. It generally appeals to the year 6’s. They like to do that job. I think it sends all the right messages then for those children to help their friends, their young friends in school and also for the younger children to see the year 6’s behaving responsibly and perhaps something they’d aspire to when they get to year 6” (Q4-01-SM1)

Their assistance often appeared critical to the smooth running of lunch. Occasionally, children would volunteer to help with clearing up before going out to play.

“When I first started, there were dinner ladies that were seniors in their late sixties and seventies and they used to, out of their own pockets used to pay some of the year 6 children to scrape the plates and then to help tidy up and she used to do that out of her own pocket” (Q4-02-S02)

6.4.2.2 Physical and temporal inter-relations within the dining hall

Many aspects of the space, objects and time periods in the dining hall influenced each other in that the physical accommodation, the objects within it and the length of the lunchtime were inter-dependant. The dining accommodation (i.e., the space) took many forms, the most common being a dual purpose hall which was used for teaching as well as dining, and shared by packed lunch and school meal children. One school had separate halls for infants and juniors. Another had a small, dedicated dining hall for school meals that was shared with a nearby school. Ten of the schools displayed healthy eating/school meal promotional materials in the dining area, but only five displayed the daily menus.

The type of physical accommodation influenced the time available for eating. For schools with dual purpose dining halls, the times when it became available after morning teaching sessions and when it was required for afternoon teaching sessions

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were strictly defined and placed stringent constraints on the time available for eating. For one of the two schools sharing dining accommodation, only 30 minutes were available for eating to allow the dining hall to be available for the second school. Lunchtimes (inclusive of playtime) were set by the school and varied from 70-90 minutes for infants (mean = 74.5) and 40-60 minutes for juniors (mean = 54).

“That’s set by the school so presumably it would be discussed with the governors. If the school or the headteacher felt it needed to be altered for any reason then it would have to go through the governors. Any consultation then with the parents but also through, I’m not sure which department of the Schools Service but it has to go through Schools Service, the school can’t just do it on their own. As Catering, we have a say in it then and at the moment because the trend seems to be that lunch hours are reducing more and more”. *(LEA-01)*

Some headteachers reported that they had reduced the length of lunchtime, usually to restrict the length of playtime for behavioural reasons:

“That’s mainly for behaviour reasons. It was suggested, we had a sort of whole staff meeting to discuss ideas mainly for improvement of behaviour again and one suggestion was some of the children are out there for a long time in the playground once they’ve eaten, is there any way we can cut that back and maybe take time off the end of the school day.” *(Q3-02-SM1)*

Headteacher: At the moment we joined all the other schools in the area so we’re having a shorter lunchtime and we’re finishing at 3 o’clock rather than quarter past 3 and half past 3. We used to finish at half past 3 and have an hour and a half for lunch but the children became very bitchy towards each other by the end of the lunchtime.

Interviewer: In the playground?

Headteacher: Yes. So then we shortened it and then we shortened it again and now we’re sort of in line with all the other schools in the area.

(Q4-02-SM1)

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Such reductions indirectly affected the time available for eating as there was pressure to render the dining hall available for the next teaching session. During most observations, the perception was that the children's eating experience was rushed.

By virtue of the fact that most halls were dual purpose, the objects within them temporarily organised the physical space to facilitate the events associated with the particular time period. During lunchtime, all objects associated with teaching (e.g. physical education or music equipment) were removed to the perimeter and replaced by the objects associated with eating (see Figure 14). Most schools used foldable tables on wheels with either 12 or 16 integral seats which allowed them to be quickly set up and removed after use.

Figure 14 A primary school dining hall



Only four schools had dedicated storage space for the folded tables, in others, they occupied the perimeter of the hall during the teaching period. Only two schools used conventional tables and separate chairs. All tables and chairs were child sized and could be wiped over. Some schools pre-laid the tables for the younger children with knives and forks and occasionally with drinks as well. One school used a tablecloth,

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once a week on a special table used to reward good eating behaviour. Receptacles for disposing of waste/dirty plates were variously on trolleys, tables or on the stage.

6.4.2.3 Physical and social inter-relations within the dining hall

Space and the availability of tables and chairs defined the schools' seating capacity. When considered in the context of the total number of pupils in the school, Table 25 shows that no schools could accommodate all pupils (i.e. packed and cooked lunches) in the dining hall at the same time. Only four schools had sufficient seating capacity for all children eating school meals based on current levels of uptake, and one school had insufficient seating capacity for those children taking free school meals. Seating priority was given to children taking school meals and some schools had to make alternate arrangements for packed lunch children. This included children sitting cross-legged on the stage, on benches around the perimeter of the room, and use of classrooms.

Table 25 School size, seating capacity and school meal uptake

Size (no of pupils)	FSM ^a	Seating capacity	Meals served	Seat/meals ^b	Seat/size ^c
183	58	56	91	62%	31%
325	5	112	179	63%	34%
267 ^d	72	84	121	69%	31%
170 ^d	60	72	93	77%	42%
370 ^d	30	176	225	78%	48%
168	6	84	100	84%	50%
107 ^d	11	72	75	96%	67%
230	36	110	106	103.0%	48%
208	2	108	100	108%	52%
284	80	180	122	148%	63%
104	23	72	45	160%	69%

^a Number of pupils entitled to free school meals

^b Seating capacity as a percentage of school meals served

^c Seating capacity as a percentage of school size

^d Schools with extra rooms for packed lunch children

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6.4.2.4 The influence of the dining hall on children's eating experience

The children's eating experience was influenced by interactions between the physical, temporal and social characteristics in that features such as overcrowding, seating constraints and perceptible dining hall cultures emerged from the observations. Conflicts between the available space, seats and school meal uptake meant that overcrowding was a common feature of this experience. Overcrowding meant that strategies for seating the children were required which further impacted the eating experience since the children were segregated and grouped according to various criteria. The most noticeable segregations were between packed and cooked lunch children, thence by age, either using an infants/junior or a class by class split. Unruly children were often split up and one school had a boy/girl/boy/girl seating requirement which they believed helped maintain discipline.

“Apparently if all the boys sit together or all the girls they're going to argue, fight and talk so even in juniors now it's got to be boy/girl and that's how they sit in the class.” *(Q4-01-S01)*

Within these constraints, the children sat in self-selected groups. Requests for reduced talking due to increasing noise levels often limited the amount of socialising amongst the children.

“If they want to talk to their friends, they've got to talk to the person opposite them but sometimes they don't do that, they do tend to shout and then you've got to. Sometimes the headteacher comes out and she tells them to be quiet because apparently the juniors are still working”. *(Q1-02-S01)*

Packed lunch children usually had more opportunity to socialise whilst eating as they received less supervision and were not hurried out of the hall as much.

A dining hall culture that was unique to each school was clearly perceptible as illustrated by reflections from the fieldnotes shown in Table 26. There were notable cultural differences between the two schools that shared the same physical accommodation - one felt intimidating with discipline being a major issue, in the other, the children were supportive of each other and the staff. In three schools, the culture appeared to be influenced by the behaviour of a key individual, in one case the

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headteacher, in two others, the cook-in-charge. There was generally a strong perception of camaraderie and team work within and between midday supervisors and catering staff.

Table 26 Perceptions of dining hall culture (reflections from fieldnotes)

School	Perceptible features of dining hall culture
P01	Friendly, nurturing, family-like atmosphere
Q1-02	Rule bound, structure found, mechanical not interactional
Q2-01	Smooth running, children enjoyed eating, hands-on headteacher
Q2-02	Friendly, mutually respectful, well-balanced meals consumed, highly motivated cook
Q2-03	Good eating behaviours, highly motivated cook, exceptional social environment
Q3-01	Poor discipline, small meals served, high food waste, children shouted at
Q3-02	Small and friendly allowing the personal touch from staff
Q3-03a ^a	Intimidating
Q3-03b ^a	Well organised, friendly, respectful
Q4-01	Mutual respect and rewards used to offset potential discipline problems
Q4-02	Lack of structure and organisation, friendly, high ethnic mix

^a schools that occupied the same dining hall during different time slots

6.4.2.5 The influence of the dining hall on food consumption

In the dining area, the main activity undertaken by the children was the consumption of food. During interviews, there was a high degree of consistency between the supervisors' responses to a question which asked them to describe their role within the dining hall. The following extracts are typical of the responses and show how influencing eating is embedded within a host of other, physical tasks:

“Just keep my eye on their eating really. We line them up first and then we keep our eyes open when they are eating their dinner, make sure they eat their dinner properly, how they use their cutlery you know, the knife and fork. We cut up the dinner for them if they need to and make sure they sit properly.”

(Q1-02-S03)

“Handing out cutlery and drinks. If they need their food cut up, help with cutting up their food or whatever we do that and basically, when they've

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finished their food. We do try, obviously there are a few poor eaters, we try to encourage those. Obviously you can't force them but we do encourage them with stickers and what have you to try and eat a little bit more. And then, basically, they just bring their trays up and we clear their trays and that's it."

(Q2-02-S04)

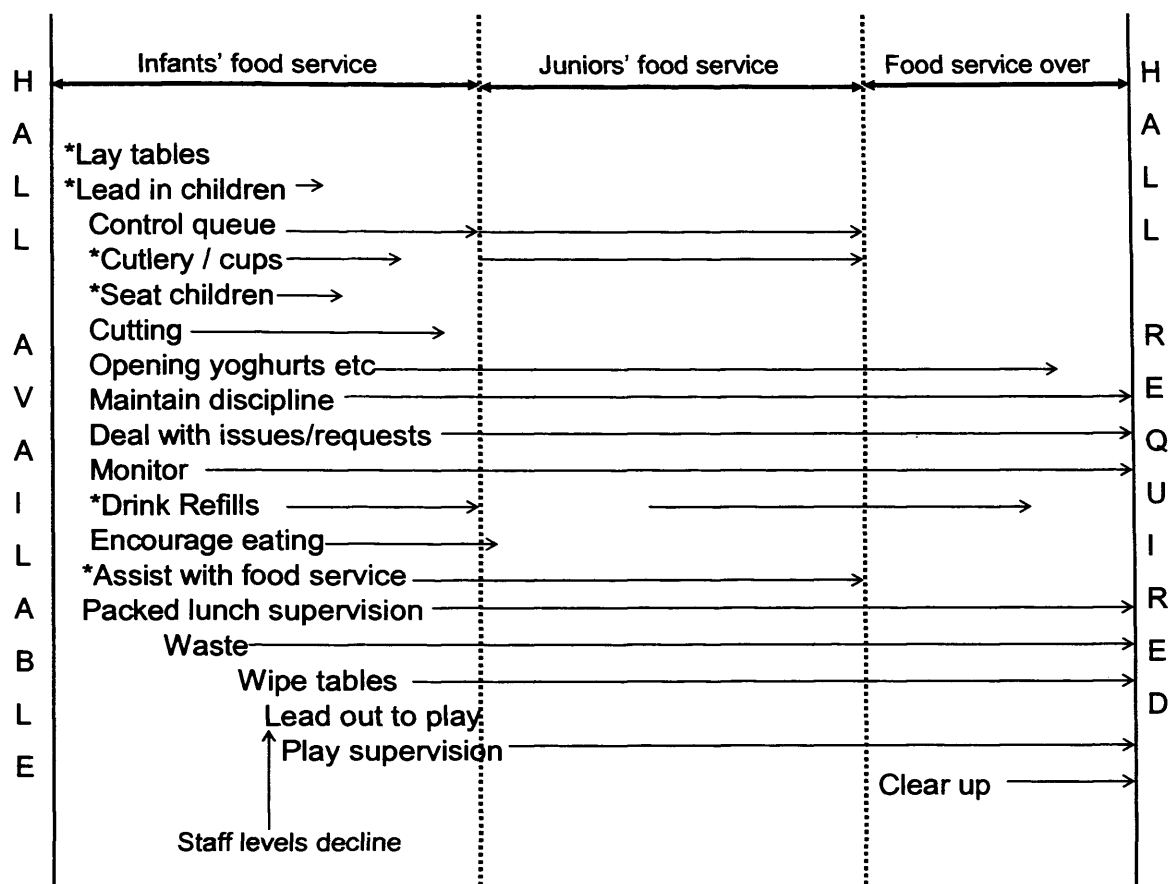
"Well, making sure they're lining up firstly orderly in a line and then sitting down the little ones, cutting their food up, emptying their trays, making sure they eat it, things like that and then clearing the tables and waiting for the juniors to come in and then putting everything away afterwards" *(Q3-03-S01)*

"Setting up the cutlery and stuff first, then we usually go and get the kids about quarter past 12, you've got to line up, hopefully in an organised manner, which doesn't usually happen, then come in, usually 6 at a time, they never say please and thank-you but we try and encourage them to say please and thank-you when they come through the door, then sit down, help them put their coats on the back of the chairs and then eat." *(Q4-02-S01)*

The timeline in Figure 15, which was derived from observational data, further illustrates how 'encouraging eating' was only one of an extensive set of activities that necessitated multi-tasking within intense spatial and temporal constraints (e.g., dual purpose halls, length of lunchtime). The dining area was volatile and dynamic such that activities were prioritised and re-prioritised on a minute by minute basis. Younger children required (and received) more attention than older children, for example, assistance with cutting food or getting seated. Many events required immediate attention, for example, if food was spilled or discipline deteriorated. The need to ensure the children's welfare, maintain discipline and adhere to time constraints meant that encouraging eating was afforded a low priority. As children left for the playground, so too did some supervisors such that, for the juniors, only one or two supervisors remained, who primarily focussed on clearing up. This intensity and unpredictability meant that a fine line existed between a lunchtime that ran smoothly and one that did not. For example, in one school, the second day of observation was marked by numerous outbreaks of unrelated discipline problems that stretched staff to their limits in stark contrast to the previous day which had run smoothly.

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Figure 15 Timeline of midday supervisors' activities



NOTES:

For each activity listed, the position of the first letter indicates the relative start time and the length of the arrow represents the duration. e.g. 'Wipe tables' commences midway through infants' service and continues until the end of lunch.

* These activities are only undertaken by supervisors in some schools

In most schools, the observations suggested that the activities undertaken were executed effectively and seamlessly in difficult circumstances. This perception was confirmed by this extract from an interview with a headteacher:

"It's like clockwork, it's quite complicated, especially at wet lunchtimes. If you look at the procedures there in terms of - it's quite a complex process really. As you say they do things automatically without realising how finite this role is."
(Q3-01-SM1)

However, one school lacked any semblance of structure, largely due to lack of support from the headteacher, and the resultant disorganisation was palpable (e.g., junior

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children accidentally being sent in to eat with the infants). In general, the promotion of positive eating behaviours was compromised by conflicts between the physical, social and temporal characteristics of the dining hall.

Chapter 7 Individual level implications for eating behaviour in school

Research aim 2 was to understand how the techniques used by school meal staff during social interactions within the primary school meal setting directly, or indirectly influence the children's eating behaviours. It was supported by three research objectives:

- A2.1 To identify the responses to healthy eating displayed by pupils, and perceived by the school meal staff.
- A2.2 To identify what feeding outcomes are sought by school managers and school meal staff, how these are achieved and the dynamics that upon them.
- A2.3 To identify the types of feeding strategies used by school meal staff and how they are implemented.

The findings relating to each objective are presented separately. Quotations from interview transcripts are included throughout this chapter. The study participant to whom the quotation is attributed is indicated in parentheses immediately after the quotation using the structure indicated in Table 20.

7.1 Primary school children's responses to healthy eating

From a SE perspective, children's responses to healthy eating operate at the intra-personal level since they illustrate the children's existing eating behaviour in school and how these are perceived by others. Three major themes emerged from the findings: a) negative responses to the meals; b) positive responses to the meals; and, c) the existence of a dining hall eating culture.

7.1.1 Negative responses to school meals

Table 27 illustrates the nature and prevalence of the issues that affected the children's eating.

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Table 27 Incidence of children's eating issues reported or observed at school level

Issue	Observed ^a	Reported by Cook ^b	Reported by Supervisors ^c
Dislikes	11/11	11/11	6/8
Poor choice	5/11	5/11	0/8
Reluctance to try 'strange' foods	3/11	6/11	4/8
Picky or fussy eating	4/11	4/11	3/8
Poor table skills/food knowledge	5/11	3/11	2/8
Deliberate avoidance tactics ^d	0	2/11	1/8
Preferring to be out to play	0	0	3/8
Gagging on food	1/11	1/11	1/8

NOTES:

^a Number of schools in which the issue was observed

^b Number of schools whose cook(s) reported the issue

^c Number of schools whose supervisors reported the issue during formal interviews (supervisor interviews were only carried out in 8 of the 11 schools in the sample)

^d e.g., hiding food on the plate, dropping food on the floor

Food dislikes

Disliking the food that was available for the school meal was the most common issue in all schools. This emerged from the frequency with which it was observed/mentioned (see Table 27) and also by the emphasis placed upon it within the discourses:

Interviewer: From the child's perspective, you've mentioned likes and dislikes, what is the biggest barrier that a child will put up to eating their school meal?

Manager: 'I don't like it' (LEA-02)

Interviewer: What would you say is the biggest problem the children present to you as regards eating? For example, is it that they are not able to choose, is it that they say 'don't like'?

Headteacher: I think it's the 'don't like'. (Q2-01-SM1)

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“They’re very certain, they know what they want and they know what they like and it’s very, very difficult to get them to eat.” *(Q1-02-S02)*

Popular menu items varied both within and between schools and had a bearing on the children’s food choices and consumption, as well as uptake:

Cook: ...here, they’re not that good at eating vegetables at all compared to a lot of other schools. The same with the mashed potato, they don’t like it

Interviewer: I noticed the mash.

Cook: They either say no, you probably noticed today a lot of children had nothing on their plate and if they do have it, invariably it goes in the waste. *(Q1-02-C01)*

“Oh they love cucumber but then you could go to another school in the area and they’ll say they hate cucumber, but they love tomatoes. It just varies so much from each school doesn’t it” *(Q4-02-C01)*

“Well, they have cooked dinners on a Thursday but we find the numbers go down then. They always go down on a cooked dinner day” *(Q3-01-C01)*

Children’s preferences for a particular menu item occasionally varied across days:

“We have fresh cabbage, it’s just they blow hot and cold, one day they will take it and the next day they’ll say they don’t like it and you know they’ve taken it the day before or the week before”. *(P01-C01)*

“The rice pudding went very well today whereas sometimes they don’t touch it so I only did the usual amount and I thought I won’t put extra on today, I’ll use up some of the mousses and things for freezer space and of course they all wanted rice pudding, it’s funny.” *(Q2-02-C02)*

In addition, the menu was often not aligned with the preferences and experiences of children of ethnic minorities.

“We get the picky eaters and things like that and when children come to us from different countries, they do find it difficult” *(Q4-02-SM1)*

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“We’ve got several children from ethnic minorities who are perhaps not used to eating with the same kind of cutlery. One little Chinese boy this year into reception and just things like explaining to him, his English was very poor as well, and just trying to explain that you eat the main course first and then the dessert.”
(Q3-02-SM1)

Poor choices

Figure 16 Nutritionally imbalanced meals observed on children’s plates

Bread and Chips	Sausage and ice-cream
Vegetable, potato, cookie	Beans, chicken nuggets, yoghurt
Chips only	Filled roll and mash
Filled roll and cake	Cheese wheels and flapjack
Beans, bread and flapjack	Beans, fish fingers, choc ice

Nutritionally imbalanced meals and/or small portions were frequently observed (see Figure 16) and also mentioned by cooks and could occur despite the best efforts of the servers:

“The girls will say ‘come on you must take a veg’ or take something on your plate. But kids you’ve seen some of the plates today and some of them are worse than that some days. It depends on the dinners ”
(Q3-01-C01)

Plate content varied from full plates, pleasingly presented and representative of the nutritionally balanced menu, to plates with small portions, possibly containing only a subset of the menu. It was common in many schools to see entire meals/portions of specific foods thrown away untouched and also for children to take small portions but still throw them away. The following extract from the fieldnotes illustrates the impact this observation had on the observer:

I was shocked by how many children took so little and threw so much away.
(Q1-02-F01)

In contrast, in some schools, levels of waste were lower, even if the original portion sizes were small.

Interviewer: What I appeared to see is that generally what you are serving them seemed to be getting eaten. Was that specific to today?

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Cook: I think it was. Some days it is and some days it's not.

(Q3-01-C01)

Levels of waste were not related to whether the children had a free choice, assisted choice or no choice over what food they were served.

Poor table skills/ food knowledge

It was evident from the both the observations and interviews that some children exhibited poor table skills and food knowledge. Many schools found this a particular problem at the time of the September intake such that some questioned whose responsibility it was to address these problems:

“You’ve got to remember what we face in September and I speak across the board. You’ve got 3 year olds coming in and they don’t even know what a knife and fork is. They don’t even know how to sit on a chair because they’re used to kneeling on coffee tables and eating and watching TV. They don’t know how to interact at a table”

(LEA-02)

“Lots of children when they first start school, I know it’s going to be quite hard to believe, don’t know.. they know the popular vegetables but they don’t know all of them.”

(P01-C01)

“They don’t know how to use a knife and fork like they used to. I mean, there’s a lot of those sort of issues which are not our responsibility really but somebody else’s responsibility in that they don’t sit still at a table to eat with a knife and fork and I think the type of food that they probably have is something quick that they can pick up with their fingers and things like that.”

(Q1-02-C01)

Although many negative eating behaviours were observed and reported, a number of positive eating behaviours were also evident.

7.1.2 Positive responses to school meals

During the observations, some children could be seen to consume the food quickly, leaving little waste. This might depend on the food on offer (for example, chips). In some schools, children asked to have salad and were actively choosing fresh fruit over other forms of dessert:

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Cook: I find we go through a lot of fruit.

Interviewer: I noticed that they were eating a lot of fruit, the fruit salad looked lovely and they were taking the fruit salad.

Cook: We do 18 to begin with. You can guarantee that we have to make more. Which when you look at the number of children we do, percentage wise [10%], that's quite a few taking fruit.

(Q3-03-C01)

7.1.3 Dining hall culture

In addition to the eating behaviours of individual children, a prominent feature of the observations was that the lunchtime scene left the observer with a perception of an eating culture of each school as a whole as well as a range of normative behaviours acted out by the children en masse.

Dining hall culture

In each school, it was possible to detect an eating culture defined as a perception of the of the eating behaviours exhibited by most of the children. Sometimes this was positive where children could be observed eating and socialising together, or where the majority of children were served full, nutritionally balanced plates of food that was also consumed. In other schools, this perception was negative where children socialised (or mis-behaved), or where the majority selected small portions, imbalanced meals or wasted their food. The latter illustrated how levels of waste may be inappropriate as an indicator of consumption at the school level if considered in isolation since children may not select the food in the first place, and the cook may have reduced the amounts prepared as a result. Similarly, staff would often describe the eating behaviour of their school as an entity:

“They're fantastic here, they will practically eat most of the stuff and that is one thing they really don't like. They're really, really good otherwise”

(Q2-01-C01)

“I would say they are fussy eaters and I would say at home. I would say in the main they are fussy eaters whose parents will buy them the food they like at home”

(Q2-02-SM1)

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Behavioural norms

It was also evident from the observations that the children would enact the lunchtime procedures particular to their school without constant direction. These included the placement of bags and coats; queuing at the service points; obtaining drinks and cutlery; sitting at designated places by age and lunch type (dinner versus packed lunch); raising hands for attention; obtaining 'seconds'; disposing of food waste and dirty dishes; and, procedures for leaving the dining hall to enter the playground. The following extract from an interview with a supervisor suggests that norms were perpetuated via pre-existing practices:

Supervisor: They always ask if they can have their dessert, yeah.

Interviewer: How do they know that they have to ask?

Supervisor: I don't know. It must have come from the teachers. It doesn't come from us it comes from the teachers. I was surprised, they all ask, the majority ask, yes. (Q2-01-S01)

Other mechanisms that perpetuated these norms included school rules, modelling by others and real-time instruction:

"Some of the little ones will start on the dessert because it's what looks nicest and then work their way back so it's explaining conventions to them and how to use the cutlery because some of them haven't used cutlery and they'll go straight in with their hands and things like that." (Q3-02-SM1)

"I expect the children to make an effort to eat and I make rules and regulations that they have to sit at a table and eat nicely." (Q2-01-SM1)

"Well what they usually do is they have a buddy system which is somebody from the older class and then lunchtime the older child comes in with them sits with them or stands by them so just to explain where they need to go and what they need to do and things like that." (Q3-03-S01)

These findings define those eating behaviours at the innermost level of both the McLeroy model and EST (Bronfenbrenner, 1979, 1986; McLeroy, et al., 1988). From a SE perspective, such behaviours are subject to multiple layers of influence, for example, from inter-personal relationships with others who may prioritise some eating

behaviours over others. The findings identified which feeding outcomes school meal staff sought to influence.

7.2 Feeding outcomes sought by school meal staff

Two major themes emerged from the observational and interview data relating to the feeding outcomes sought by school meal staff. The first theme related to the identification and incidence of the outcomes themselves. The second related to the existence of certain individuals who exhibited a strong advocacy for the role school meals. As reported in Section 6.4, school meal staff had separate jurisdictions in that midday supervisors operated in the dining hall where children were consuming their food, and catering staff operated in the service area where children were making their food choices. Accordingly, the feeding outcomes sought by each will be separately reported. In all cases, the relative importance of each feeding outcome was assessed based upon the number of times it was mentioned during interviews or recorded in observational fieldnotes.

7.2.1 Feeding outcomes sought by midday supervisors

The feeding outcomes sought by supervisors were child-centric in that they reflected concerns for the child's welfare (e.g., being hungry) or development (e.g., tasting food, table etiquette) as opposed to (e.g.,) a desire to satisfy policies or meet service targets. Encouraging consumption emerged as the predominant feeding goal as these extracts selected from interviews with supervisors in all four socio-economic quartiles illustrate:

“...we are there to make sure the children are eating”. *(Q1-02-S02)*

“We do try, obviously there are a few poor eaters, we try to encourage those. Obviously you can't force them but we do encourage them with stickers and what have you to try and eat a little bit more”. *(Q2-02-S04)*

“I would try and encourage them just to take something and try a little bit more and eat a little bit more of it”. *(Q3-03-S01)*

“I try and get them to eat at least a few mouthfuls.” *(Q4-02-S03)*

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Other objectives that were mentioned (or observed) amongst supervisors were to avoid the child going hungry, to ensure they drank enough, to avoid waste, and to encourage the child to *taste* the food:

“So at the very beginning when they start we used to say ‘Just take a bit today and try it and see if you like it’ but then obviously it just gets chucked in the bin. So now, because this has been going on, this was never from the very beginning, this was introduced some time ago. This little extra bit on the table [free salad]. And at the very beginning, we made them take a bit just to taste it but as the months and the years have gone by, if they don’t want it well, they throw it in the bin.” (Q1-02-S02)

“.....especially in the summer I make sure they drinks plenty” (Q2-01-S01)

“As long as they eat enough to keep them going until they get home. I don’t like to see them going hungry in the afternoon but as long as they have got enough down them to keep them going I think they’re OK because their parents can see to them then can’t they.” (Q2-02-S02)

Although liking was frequently mentioned, it would typically be as a reference to an *existing* eating behaviour (see Section 7.1), rather than a targeted feeding outcome:

“I’ll ask them if they like it or not you know because some children don’t like everything do you know what I mean. They can’t please every child and obviously if they like it and I’ll make sure they eat it”. (Q2-01-S01)

Some outcomes sought were not related to the ingestion of food, for example, good manners, sitting down (rather than standing) to eat and correct use of cutlery (rather than fingers):

“We keep our eyes open when they are eating their dinner, make sure they eat their dinner properly, how they use their cutlery you know, the knife and fork. We cut up the dinner for them if they need to and make sure they sit properly”. (Q1-02-S03)

7.2.2 Feeding outcomes sought by catering staff

Catering staff exhibited and spoke about a range of feeding outcomes as illustrated within Table 28. Outcomes concerning food choices were more common than all the others combined²³.

Table 28 Feeding outcomes sought by catering staff

Objective (in descending rank order) ^a
Allow the child free choice
Assist food choices
Not to allow food choices ^b
Encourage consumption
Encourage tasting
Avoid food waste
Serve a nutritionally balanced meal ^c
Avoid the child going hungry
Prepare a nutritionally balanced meal ^c
Maintain school meal uptake
Increase liking for foods

^a Based on observation and times mentioned in interview

^b Offer a choice menu but insist on balanced meals OR remove choice from menu

^c Reflects a difference between the meal reaching the plate versus just being available on the counter

Serving staff were keen for children to taste the food and would express concerns about children going hungry:

“If children slack off and are saying ‘oh I don’t want veg’ we’ll say well we’d like you to try them again, although you’ve tasted them before, as you’re growing, your tastes change and you might like them this time” (P01-C01)

“Like, the other day we had corned beef hash which I can’t make from scratch because there’s a lot of frying of things involved with it so I buy that in. And the kids said ‘Oh I don’t’, I said ‘Well look’ so I’ll get a little spoon and I’ll let

²³ The approaches towards actively managing food choices are presented in Section 6.2.2.

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them have a taste and what they'll do then is say 'Oh I like that' and then they'll have it. But they don't know what it tastes like see". (Q3-02-C01)

"Some children come in and they spill something on their sandwiches from home, we try and accommodate and give them whatever they have. They can have a hot meal or they can have, if I can I can make them a sandwich so they're not going without any lunch" (P01-C01)

Staff were aware of the requirements for the food they cooked to be cooked healthily and nutritionally balanced, as well as the need to ensure that the food actually served on the child's plate was nutritionally balanced.

"Nothing can be done in chip fat, we get told that, we get told no frying, it's got to be done in the oven. A lot of kitchens would have done these in the deep fat fryer because it's easier" (Q3-02-C01)

"I just usually say 'It's just a tickle, try it or you can leave it'. But they always have to have it on their plate." (Q2-02-C01)

Catering staff also sought to achieve goals that were not child specific such as avoiding waste and preparing/serving nutritionally balanced meals:

"we decided ourselves [to serve salad rather than allow children to help themselves] because it would either just get left or they'd take it and it would just be wasted anyway" (Q1-02-C01)

"I'm hoping they'll take at least 3 items. If they take the main, the veg and the bread I'd be more than happy because then they've got the protein and the veg and the starch in the bread and the carbohydrate." (Q3-03-C01)

"They've got to have at least 2 items on their tray. We always try to get them to have a little bit of vegetables, even if it's only a spoonful of beans or a little bit of beans. Sometimes they eat it, sometimes they don't" (Q4-02-C01)

School meal uptake and increasing children's liking for foods were the least frequently mentioned feeding outcomes.

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7.2.3 School meal advocates

In some schools, observed behaviour in the dining hall and the enthusiasm conveyed during interview suggested that one particular individual believed passionately in the importance of nurturing positive feeding outcomes. This was often the cook whose enthusiasm could sometimes appear to motivate other staff at the servery or within the dining hall. Occasionally, the enthusiasm of the cook would offset an apparent disinterest in the dining hall that could be perceived from the actions/words of a headteacher. In one instance, it was the headteacher herself who was passionate about the importance of eating. She had started her headteaching career in small temporary accommodation with less than thirty children, giving each one individual attention at lunchtime. At the time of the study, the school had grown to several hundred and had new accommodation. Nevertheless, the headteacher still went into the hall every lunchtime time and gave the smaller children individual attention. In this school, it was noticeable how much pleasure all the children took from their food, and how the older children chose to sit amongst the younger ones, socialising and eating with them. On the other hand, this enthusiasm did not appear to influence the staff. Over the two days of the observation, all of the supervisory staff were ill at some stage, and supervisory duties were undertaken by teaching assistants and teaching staff (which was standard practice) – the latter being particularly distant from the children.

The findings, therefore, illustrate the eating behaviours that school meal staff seek to influence during their inter-personal relationships with children, together with the current status of these behaviours. A number of techniques were used to influence these behaviours.

7.3 Feeding strategies used by school meal staff

The inter-personal processes associated with eating behaviour in school took the form of the feeding strategies used by school meal staff during social interaction with the children. Interactions took place in two physically distinct areas - the service point and the dining hall – and exhibited a clear taxonomy which was common to both areas. Other characteristics included the protocols used to select a strategy, the message the strategy intended to convey and the category of child the messages were directed at.

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7.3.1 Taxonomy of strategies used at the service point

The service point was the domain of the catering staff who used numerous techniques to influence feeding as shown in Table 29.

Table 29 Number of schools (out of a total of 11) in which at least one member of staff employed a specific technique (either frequently or occasionally) to influence eating at the service point, tables and waste point

	<u>Service Point</u>		<u>Tables</u>		<u>Waste Point</u>	
	Used frequently	Used occasionally	Used frequently	Used occasionally	Used frequently	Used occasionally
MODELLING	0	0	0	1	0	0
REWARDS						
Stickers	0	0	1	3	0	2
Special Award	0	0	3 ^a	0	0	0
Praise	2	2	1	5	0	2
RESTRICTION	0	1	0	0	0	0
PRESSURE						
'Must' have/eat	4	3	0	6	0	1
ENCOURAGEMENT						
Try/one more bit	2	5	1	10	0	2
Other verbal	9	2	1	8	0	0
NORMS						
Food order	0	0	5	5	0	0
Table etiquette	0	0	1	2	0	0

^a Certificates awarded during school assembly or a special table with a tablecloth and flowers

Verbal encouragement

The most common technique involved the use of verbal encouragements. In one school, the frequency and variety of such verbalisations were too many to note during the taking of fieldnotes but included:

“Would you like...” (in a singing voice)

“Better to have a tiny bit”.

“Have a little bit, it won't hurt you”

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“Go on, try one”

“Will you have some peas, go on, it’s not difficult is it?”

“Do you want to try some rice pudding today?” (Q2-03-F01)

In three schools, catering staff occasionally paired verbal encouragement and praise within the same utterance, for example:

“Go on, you try... Good boy”. (Q2-03-F01)

“Do you want... good boy, then you can choose your pudding” (Q3-02-F01)

Within each menu ‘category’, choices were offered as (eg) ‘sweetcorn or salad’ . ‘what do you want’ occasionally reinforced with a ‘good boy/girl’

(Q4-01-F01)

This contrasts with two other schools where the number of verbalisations by catering staff was minimal.

Restriction

The service point was the only area where overt restrictive practices were observed, and then, only in one school, taking the form of refusing larger than standard portions.

Interviewer: I noticed that you stopped a little boy from having thirds.

Cook: Yes. We have a problem with this little boy. He tends to keep coming back.

Interviewer: Has he got a big appetite?

Cook: I think it’s more that he’s being a little bit greedy towards the end because sometimes he don’t eat it all and he will push it aside so I think it’s just being greedy. (Q4-01-C01)

Restriction was an indirect consequences of menus and portion sizes having been defined up front by catering managers in accordance with nutritional guidelines.

Modelling (teacher and peer)

The ratio of child:adult meals served was 125:1 presenting little opportunity for the modelling of food choices by adults. In one school, staff automatically went to the head of the queue to be served and a number of staff entered the hall to converse with

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the cook. On one day of the observation, this occupied 5 minutes of the cook's time such that children were still waiting to be served at 12:55pm.

Instances of peer influence were reported with respect to food choice:

"But you do find, sometimes what happens with the younger ones, if one of them says no to something, the next few along the line say no" (Q1-02-C01)

"you've got to remember as well if you watch the counters, you'll probably have a group of friends and if John chooses cottage pie then you can guarantee the other 4 will as well. Now if you're trying to promote say a healthy or perhaps she's done a new dish or she's trying out something or she wants to try some fish, no way on this earth will you get those 5 to do it because they work as a peer group as well even at that age as little as they are, they work as a peer group" (LEA-02)

"every school seems to have its own favourite. You can't quite understand why but they're usually driven by peer pressure" (LEA-03)

Peers were also reported as influential in the child's decision to take school meals:

"once they get to the juniors it can be 'if my friend's having sandwiches, I'll bring sandwiches' and again you lose dinners" (Q1-02-C01)

7.3.2 Taxonomy of strategies used in the dining hall

The dining hall was primarily the domain of supervisory staff (i.e. midday supervisors, occasionally assisted by teaching staff) where interactions took place at the tables and the waste point. For the midday supervisors, actively influencing feeding was, without exception, a lower priority than maintaining behaviour, clearing up and managing the throughput of children during what was a task intensive and unpredictable period (see Section 6.4.2.5). Table 29 shows the techniques used to influence feeding at the tables and waste point. Sometimes techniques were used in combination (e.g., verbal encouragement and immediate praise).

Verbal encouragement

The most common strategy was the use of verbal encouragements:

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Interviewer: How would you actually go about encouraging a child to eat?

Supervisor: There's a few there. The same ones every day. They just don't want to eat. How they manage all day I don't know because they don't want to eat you know. So just try and coax them gently I suppose. (Q2-03-S01)

"We encourage them to try things because some of them, with children, they don't even want to try. So we just walk round the tables, make sure they're eating. If they're not eating we ask why. If they don't like it, we ask them to try it. Obviously they do try but if they don't want it we can't do anything about it." (Q1-02-S02)

The imposition of norms

Many of the behavioural norms that were imposed in the dining hall related to eating behaviour. The most common requirement was that the main course was eaten before the dessert:

"The little ones, you cut up their food and they've got to ask permission if they can have their afters. They mustn't eat their afters, they've got to ask permission but they, if they don't eat nothing, you've got to say 'Oh can you eat this' you know 'a little bit of this' (Q1-02-S01)

"The infants will ask 'Can we have afters' so you go and check their plates and, well I do anyway, check before you say yes, make sure they've eaten enough." (Q3-03-S01)

Others included table manners (i.e. using a knife and fork) and that if the child chose the food whilst being served, they were then expected to eat it.

"One little Chinese boy this year into reception and just things like explaining to him, his English was very poor as well, and just trying to explain that you eat the main course first and then the dessert. Some of the little ones will start on the dessert because it's what looks nicest and then work their way back so it's explaining conventions to them and how to use the cutlery because some of them haven't used cutlery and they'll go straight in with their hands and things like that." (Q3-02-SM1)

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So that's what we try and do..... 'it's the same menu every other week, if you don't want it then just say because you get an option if you don't want it, then don't ask for it'" (Q4-02-S02)

Modelling (teacher)

The single instance of modelling related to a headteacher eating at the same tables as the children on the day they undertook dining hall duty. Very few adult meals were served and these generally were taken out of the hall for consumption. In one school, two children were observed carrying a teacher's tray of half eaten food back into the dining hall to dispose of it. This school could be characterised as one where the serving of small portions was common place and levels of waste were high. In another school, the deputy head collected a baguette that the kitchen staff had prepared and then assumed supervision duties, eating his baguette on the move. When questioned, he stated that everybody had to 'muck in' that day as the supervisors had not turned up for work.

Rewards and encouragement at the waste point

Although many of the strategies took place at the tables, the waste point provided an opportunity for supervisors to interact with the children, albeit, dependent upon the procedures devised by the school to collect waste food and dirty dishes. This opportunity was occasionally used either to reward a child for eating well or to encourage them to return to the tables and eat a bit more. Such practices were both observed and described at interview as the following extract shows:

Supervisor: "I think they think that if they don't eat it then I can go out [to play]"

Interviewer: "And are they right or will you stop them?"

Supervisor: "No they'll bring their plate. With the juniors they normally empty their plate but if they haven't eaten enough, I will, I mean for instance, send them back for some more."

Interviewer: "Do you find that they will listen to you?"

Supervisor: "Yes."

Interviewer: "That's good to hear anyway."

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Supervisor: “I say, ‘that’s not, you’ve got to go back and eat a bit more’ and
I will do it.” (Q4-02-S01)

Missed opportunities

Many opportunities to interact with the children and encourage eating were not taken. For example, many supervisors spent a lot of time cutting up the younger children’s food. This was sometimes done in silence even though it presented an opportunity to verbally engage with the child. In some schools, very little verbal interaction with the children took place whereas in others, there was frequent, ongoing interaction. In some schools, the verbal interactions were initiated by the children by the raising of a hand or calling the supervisors’ names (e.g., to ask for food to be cut or yoghurt pots to be opened). In general, there was a discrepancy between the amount of time that supervisors were *observed* encouraging the children to eat and that which could be inferred from the interview data alone.

The eating behaviours of school children within the dining hall were, therefore, subject to a number of strategies invoked during their inter-personal relationships with school meal staff both at the service point and in the main body of the dining hall. As well as falling within the taxonomy described, the strategies exhibited a range of other characteristics.

7.3.3 Other characteristics of feeding strategies

Other characteristics associated with the feeding strategies used included the protocols used to select the strategy; the message it intended to convey; and, the category of child the messages were directed at.

Protocols used to select feeding strategies

There were discernable informal protocols that governed the feeding techniques selected. Anything perceived as force was considered inappropriate for a variety of reasons (see Table 30). This view was expressed by all categories of interviewees (cooks, school managers, supervisors, catering managers/working partners):

“we do tell them but you can’t physically make them eat them unfortunately”

(P01-C01)

“Making an issue about not eating is not effective, what is need is gentle encouragement.”

(Q3-03-SM2)

“You try and encourage them but I don’t force them. If they don’t like it, I just say ‘try it’ and if they don’t like it I’ll just say ‘right, ok then’ and if that happens over a couple of days I say to the teacher ‘well they’re not really eating their food’. Perhaps their Mums would rather let them have sandwiches. But that’s what we do. From experience, like my children going to school, there’s nothing worse. But if that’s in their mind all the time the dinner lady made me eat this they never forget.”

(Q2-02-S01)

“I know that sometimes like a parent you might give them food and you may be stressed and say ‘oh come on, eat that dinner’ you won’t expect something like that from somebody who is paid to do the job. That is unthinkable. On the parent’s side it is not good but when the one is paid to supervise children it’s bad, it’s very very bad.”

(CONT-02)

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Table 30 Comparison of force, pressure and encouragement

REASONS TO REJECT 'FORCE'	DISTINGUISHING FEATURES
Unprofessional	<u>Force versus pressure:</u>
Respect for parental wishes	Demeanour
Children are well fed at home	Number of attempts
Avoid alienating or stressing the child	Persisting against the child's wishes
Not in the job description	Compulsion ('you must')
Child's right to eat what they want	Physical acts
Feeding is parents' responsibility	'All of' versus 'some of'
Is ineffective	<u>Pressure versus encouragement:</u>
	Allowing the child to decline
	A 'good effort' will suffice

At interview, staff expressed their individual perceptions of what distinguished force from pressure, and pressure from encouragement (see Table 30). An important part of this distinction related to when to stop a particular interaction. Attempts to influence a child would be aborted if they reacted physically (e.g., gagging/crying), or appeared to genuinely dislike the food, or be satiated.

“They do end up in tears you know. I’m thinking ‘What do I do now?’ but I don’t know actually how to handle that because I don’t want to say to them ‘Oh don’t worry, you don’t have to eat it’, you know but you can’t force them”

(Q2-03-S01)

Requiring a child to ‘finish’ their food was rejected as an appropriate strategy. Other than in one school where staff received guidance about how to interact with the children based on parents’ wishes, the messages that staff delivered through their interactions were devised themselves.

“Parents complain if we encourage them to eat.....I have lots of letters saying if my child doesn’t want it could you please leave them and our children are well fed as well. It’s free choice. It’s their dinner. If they want it they eat it, if they don’t fine”

(Q2-02-SM1)

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Messages conveyed within feeding strategies

The messages converged upon four main themes that were common to both serving staff and midday supervisors. The four themes were: a) to convey a health or nutritional message:

“I think what I do at the hatch is enough to ensure that they know it’s good for them to eat it and so I nearly always talk to every child and so I do know them and I just think I’ll always have a chat and various things. I do talk to them”

(Q2-02-C01)

“Like the little ones, one of them, he’s terrible, ‘Come on Alan, show us your muscle’ and he’s wolfing his dinner down just to show us. ‘Look at my muscles now Miss’ and we say ‘Well you wouldn’t have had them if you didn’t eat your dinner’”.

(Q4-02-C01)

“we do tend to talk to them about why they should eat the fish, why it’s so good for them and why they should eat the boiled potatoes or the mashed potatoes rather than chips all the time”

(Q1-02-S02)

“I usually say, ‘eat a bit, you’ll be big and strong like an action man’, you do don’t you and they’ll say ‘oh will I’ and they’ll start eating it then.”

(Q4-01-S01)

b) to make the eating context fun:

Interviewer: Your numbers are high in this school. There didn’t seem to be many packed lunches at all. Can you attribute that to anything?

Cook: Probably me and [*kitchen assistant*] because we’re completely nuts (*laughing*). Being honest about it, we do laugh, we do joke with the children.

(Q2-03-C01)

Supervisor: “You can make it a game to a limit but after that, you’ve got no chance of getting them to eat anything.”

Interviewer: “When you say you would make it a game, what sort of things would you do with them?”

Supervisor: “Me personally, I tell them ‘I’m going down the end of the hall now and when I come back, I bet you, you’ve ate all that’.

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Sometimes it works, sometimes it don't but if they think it's more of a 'oh quick, she's gone down the other end, I've only got a couple of minutes', they do tend to eat it." (Q2-02-S03)

c) to eat a bit / a bit more food, commonly used within the normative procedure of seeking permission to start dessert or go out to play:

"I've gone to their plates and they've said, 'I don't want no more, can we have our sweet?' and I've said 'Come on, you haven't even tried that, have a bite, if you don't like it, fair enough but if you do like it, there's no reason why you can't eat a little bit'" (Q2-02-S03)

"They've got to ask permission if they can have their afters. They mustn't eat their afters, they've got to ask permission but they if they don't eat nothing, you've got to say 'Oh can you eat this' you know 'a little bit of this'"

(Q1-02-S01)

d) to taste the food:

"The cook is quite good at trying to get them to have a little taste of things. If they don't know what something is they can be a bit suspicious sometimes and a bit reluctant to try it. Things like spag bol, they all know it because they have it at home, it's familiar so trying unfamiliar things and sometimes the vegetables with the younger ones. But usually the cook will try." (Q3-02-SM1)

"Some are, it's all according to, some they say they don't like it before they've even tasted it, we just say to them 'have you tasted it' like you know. 'Have a little taste and see what it's like after' but a few of them are a little bit picky but generally they're not too bad." (Q2-02-S02)

"Trying to get them to try it and I find with the babies, with the little ones especially, the more you try and make them, the less they'll take it. If you put it all on their plate you're more likely to get a tantrum. If a food they don't like touches a food they do they will not eat it and most children are the same if it's touching. So we'll try and let them choose what they want but try and get them to take more than one thing. And they are getting better. You just put a tiny bit

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in the corner and taste it because if you don't taste it you don't know if you don't like it.” (Q3-03-C01)

The extract above also illustrates how feeding strategies were often targeted towards specific categories of children.

Categories of children targeted by feeding strategies

Feeding strategies were often targeted at particular categories of children such as the younger ones or those that were perceived as problem eaters. Younger children were subjected to a high level of supervision and support. This was particularly true of the new intake each September:

“Every September....we've got this ethos here where we will sit with them and we will make sure that they do try the green stuff on the side of the plate. With some, you can't win because it would be like trying to force me to eat chicken but with some of them, they just, well I don't know what they eat to be honest. Pasta Bolognese is a prime example and one little girl. 'what's that?' you know so started feeding her and talking about there's carrots in it and there's onions in it and you could tell this child had no clue. But then by now [November] they are better”. (Q2-01-SM1)

However, once the infants (reception class and years 1-2) finished eating, the supervisors accompanied them into the playground, so the older children (years 3-6) were rarely supervised by more than one adult whilst eating. This limited the ability of supervisory staff to influence the eating behaviour of older children. Sometimes, strategies were targeted at poor/slow eaters and could be used reactively, for example, if a child attempted to throw food away, or based on experience of the children's past behaviours:

“The infants just have the main meal of the day and we actually put a portion of everything that's there on their plate because if we asked them 'Do you want this?' they'd all say no. And if one said no, they'd all copy so here we put a bit of everything on. They're not forced to eat it” (Q1-02-C01)

7.4 Inter-personal feeding relationships and eating behaviour

The findings presented thus far within this chapter relate to the SE processes at the individual level associated with eating behaviour in school dining halls. Table 31 is a summary of key points from within these data organised at school level. The four schools for whom data are presented in this way represent two ends of a continuum with respect to the frequency with which feeding strategies were used (i.e. from frequent to rarely). Organised in this way, the data suggest that schools where feeding strategies were rarely used were characterised by small portions; high waste; and, permissive attitudes towards choices made at the service point. Conversely, schools where feeding strategies were frequently used were characterised by high levels of consumption; the selection of well-balanced meals and fruit for dessert; authoritative attitudes towards choices made at the service point; and, a cook who was passionate about nurturing eating behaviour. One of the schools at the 'frequent' end of the continuum enjoyed higher than average uptake and spent twice as much time serving infants than juniors. There was no notable difference in the three other schools with respect to either uptake or time spent serving the children. It must be emphasised however, that other than the data relating to FSM entitlement and meals served, all of the data within this table were collected via observation rather than by rigorous quantitative methods.

Table 31 School-level characteristics of inter-personal eating relationships

Characteristic	SCHOOL Q2-03	SCHOOL Q2-02	SCHOOL Q1-02	SCHOOL Q3-01
FSM entitlement	3.57%	15.65%	1.1%	27%
Uptake (paid and free) ^a	59.52%	47.83%	48.08%	45.51%
Adult meals served	0	1	4	0
Feeding strategies: ^b				
Service point (see Section 7.3.1):	Verbal encouragement (F) Praise (F)	Verbal encouragement (F) Praise (F)	Minimal	Minimal
Dining hall (see Section 7.3.2):	Verbal encouragement (O) Praise (O)	Stickers (O) Praise (F)	Stickers (F) Negative teacher modelling	Stickers (O) Praise (O)
Children's responses to healthy eating (see Section 7.1)	Social enjoyment Salad/fruit freely chosen High consumption	Well-balanced plates Fruit popular as dessert High consumption	Small portions High waste	Small portions High waste
School meal advocate ^c (see Section 7.2.3)	Yes (Cook)	Yes (Cook)	No	No
Service time per child (in seconds) (see Table 24)	Infants – 74 Juniors – 32	Infants – 50 Juniors - 50	Infants – 56 Juniors - 58	Infants – 56 Juniors - 48
Choice strategy at service point (see Section 6.2.2)	Assisted	Mandated ('must' have)	Mandated (infants) Free choice (juniors)	Free choice

NOTES:

^a Range 44.37% - 70.09%. Mean 52.62%.

^b F = frequently used; O = occasionally used

^c An influential person with passionate beliefs about foods which were reflected in their observed behaviours and interviews

7.5 Summary of results

At the organisational level of analysis, whilst reflecting the primary objective of national policy with respect to the nutritional content of the school meal, LEA and school policies were also influenced by multiple, competing interests including parental views, pupil's food preferences or organisational objectives, such as protecting school meal uptake. Tensions existed between food availability and choice such that menus incorporating choices based on children's preferences were viewed as facilitating service viability and prioritised over promoting healthy eating. The catering staff were the final arbiters regarding the food actually served to the children such that their individual working practices and beliefs affected the food available and the extent to which children were encouraged to choose it. The format that schools adopted for the school council consultations took the form of structured meetings during which the children presented their viewpoints. These were either solicited from their peers using questionnaires or by the researcher/teachers asking specific questions during the council session. The promotion of healthy eating in schools was conceptualised in terms of food availability, which was expected to align with personal preferences, and food interactions, which involved being encouraged to eat by school meal staff. The dining halls had numerous generic attributes (e.g., accommodation, equipment, length of lunchtime, social actors). These interacted to have a direct, but not necessarily positive, bearing on food choice and consumption. Overcrowded, multi-purpose dining halls coupled with time pressures and dynamic social situations detracted from the eating experience and the ability of staff to encourage children to eat.

At the intra-personal level of analysis, the children's food dislikes featured prominently. On the other hand, the most common feeding outcome that serving staff sought to influence was choice, whereas supervisors most commonly sought to influence consumption. At the inter-personal level of analysis, most feeding strategies used by school meal staff reflected those reported in the literature (e.g., pressure, encouragement and rewards). Purposeful modelling of eating behaviours was not found and restricting access to foods was rare. The imposition of food norms, such as eating dessert last, although not reported in the literature, was common. School meal

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staff readily, if not consistently, used these strategies although the constraints and opportunities of each dining hall context influenced their selection and implementation. However, even if children left the service point with nutritionally balanced meals, they often failed to eat them

Chapter 8 Discussion

The modification of children's eating behaviour may present health improvement opportunities due to associations between childhood behaviour and health and behaviour in adulthood. Health improvement incorporates a broad spectrum of approaches ranging from health education, health surveillance and treatment, to the promotion of health behaviour. From a theoretical perspective, explanations of health behaviour can be conceptualised socio-ecologically. Indeed, some contemporary health improvement policies include a dual emphasis on individuals and environments. Such policies originate from the 1986 Ottawa Charter which empowered individuals to take control over their health, supported by the establishment of enabling environments such as workplaces, communities and schools. Indeed, the concept of the HPS originated out of the Ottawa Charter. HPSs adopt a holistic approach to education wherein formal learning is complemented by pupils' experiences in the wider school context, for example, during school meals.

The SE organisation evident in health behaviour theory and policy is also evident within a number of SE frameworks that have informed the translation of policy to practice. In particular, the McLeroy model suggests a multi-level approach to health improvement based upon influences operating within and between the policy, community, organisational, intra-personal, and inter-personal levels of the model. An evaluation of previous nutritional interventions against this multi-level SE structure reveals a number of under-researched issues. Nutritional education has been shown to increase children's knowledge but this knowledge is not always reflected in their behaviour. HPSs, meanwhile, aim to complement formal learning through the child's experiences of nutrition in school. The school meal service plays an important role in this process. School meal services in the UK are being transformed by national policies, one objective of which is to revise the nutritional standards for school meals. However, a number of complex inter-related SE processes threaten to undermine such policies. For example, at the intra-personal level, children remain reluctant to eat the healthier meals on offer. In anticipation of such issues, reciprocal relationships between the policy and intra-personal levels have been put in place in the form of pupil engagement mechanisms, such as SNAGS. However, SNAGS involve

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structured formats, power relations and a reliance on cognitive functions, such as the ability to take the perspective of others, which may be under-developed in younger children. School councils, however, may be less subject to such issues, but little is known about their potential to strengthen policy objectives. In addition, school meal provision is subject to multiple inter-organisational processes between hierarchical layers of government and school meal providers, as well as intra-organisational factors, such as resources, the implications of which are not well understood.

Potential solutions to some of these issues are suggested by applying a SE perspective to the acquisition of eating behaviours during childhood. Although many previous nutritional interventions have had disappointing outcomes, others have had promising results by utilising the social interactions between school meal staff and children. The SE processes involved are largely associated with the intra- and inter-personal levels where theory suggests that eating behaviours such as consumption, choice and liking are learned from infancy onwards through mechanisms such as social learning, classical conditioning and operant conditioning. One way in which these learning mechanisms are invoked is through feeding strategies defined as techniques invoked within social interactions that influence eating behaviour. Strategies involving modelling by parents, peers and teachers, RTE, restriction, pressure and encouragement are known to influence consumption, choice and liking and have been widely studied in children aged between 3-5 years. However, little is known about the eating behaviours that school based caregivers seek to achieve, and whether and/or how feeding strategies are used in the course of social interactions in the primary school meal dining hall. At the organisational level, meanwhile, ecologies of practice, such as ideologies and attitudes, have been shown to affect the implementation of educational and health policies. However, the impact of the practices of individuals engaged in the delivery of school food policies is not well understood. In addition, physical, temporal and social attributes of the school dining hall environment such as space, length of lunchtime and staff skill sets may also influence eating behaviour and, indirectly, health improvement policies.

The research aims and objectives sought to explore these issues and opportunities in more detail. The discussion commences by considering the utility of the socio-

ecological approach as a theoretical and methodological tool and proceeds by analysing the research findings from various SE perspectives. At the policy level, the barriers associated with implementing healthy eating policies in Wales are considered, followed by the challenges associated with children's responses to healthy eating and pupil consultation. As these challenges represent negative reciprocal influences between children and policy, the potential to offset them by processes operating at the organisational and inter-personal levels is then discussed making a number of recommendations. The discussion proceeds by considering the recommendations made in the wider context of HPS philosophy. It concludes by evaluating the research quality before presenting some reflections on researching in the field followed by the opportunities that arose during the study for knowledge transfer.

8.1 The socio-ecological approach

Social ecology was used within this thesis as a theoretical and methodological framework for research into the public health challenge associated with the links between nutritional behaviour and health. This ensured that a similar and consistent approach was used across all stages of the research, ensuring that the resultant implications for health improvement policy and practice were socio-ecologically organised, and, by definition, compatible with the problem under consideration.

8.1.1 Social ecology as a theoretical framework

Social ecology was suggested as a theoretical approach as it was clear from the literature that explanations of health behaviour (Bronfenbrenner, 1979, 1986; Dahlgren & Whitehead, 2006); health improvement policies and approaches (e.g., Acheson, 1998; World Health Organisation, 1986); and, health improvement frameworks (e.g., McLeroy, et al., 1988) were all predicated upon its principles, i.e. individuals, environments and the relationships between them. The McLeroy model emphasises the existence of multiple SE influences at the policy, organisational, community, inter-personal and intra-personal levels, together with relationships within and between these levels. One of its recommended uses is as an analysis tool and, as such, it facilitated the literature review in that theory underlying health improvement policy and research was explored from a number of directions. In particular, health improvement policy was initially examined 'top-down', from the policy level to the

intra-personal level. In this way, it emerged that policies were at risk of not achieving their objectives of effecting changes at the intra-personal level, i.e., the two levels were inadequately socio-ecologically connected. Therefore, the literature was re-analysed from a second SE starting point, from the intra-personal level to the policy level. Although this second examination of the literature also suggested an imperfect set of connections between the intra-personal and policy levels, it revealed a number of opportunities to offset the issues that emerged from both analyses. Thus, superimposing the two resultant sets of literature was critical to the formulation of the research aims and objectives. At a theoretical level, therefore, the SE approach informed the literature search strategy and was integral to the review of the literature, thence the argument used in the formulation of the research aims and objectives. It further informed the organisation and analysis of the findings, allowing them to be discussed in the same context as the original literature review. This implies that the research recommendations are compatible with the issues they seek to address, improving the holistic qualities of existing health improvement policy and practice. Thus, this study makes a unique research contribution by undertaking a holistic SE analysis of a major public health challenge - prevention of chronic disease through early nutritional intervention – complemented by a holistic SE exploration of possible implications for future policy and practice.

8.1.2 Social ecology as a methodological framework

The SE framework informed the methodology, design and recruitment strategy. In this way, a consistent approach was applied to both the literature review and the generation of methods, ensuring that the exploration of solutions mirrored the original questions. These socio-ecological considerations resulted in some specific strengths and weaknesses.²⁴

From a SE perspective, policies which seek to improve population health are regarded as important health promotion leverage points. In 2007/8, the European Union (EU) commissioned a systematic review of the effectiveness of school based nutritional interventions as part of the impact assessment of a proposed agricultural policy (de Sa

²⁴ A more general discussion of the research quality can be found in Section 8.7

& Lock, 2008). One objective of this policy was to support F/V schemes in schools within the EU both financially and through the F/V supply chain. The review supported this proposal suggesting that it would increase F/V intake, stimulate agricultural markets, reduce health care costs and reduce health inequities. In this way, such a policy would introduce macro-level changes in anticipation of public health improvements. In contrast, the unique contribution of this study is the identification of numerous micro-level (as opposed to macro-level) leverage points, for example, the promotion of pre-existing behaviours in school meal staff, also in anticipation of public health improvements. SE research methodologies are, therefore, recommended for use during the theory and modelling phases of the Medical Research Council's framework for the development and evaluation of RCTs for complex interventions to improve health (Craig et al., 2008). Further methodological implications of the SE approach relate to the use of case studies.

8.1.2.1 Social ecology and the use of case studies

Previous commentators on social ecology have noted that its 'everything influences everything' is both its greatest strength and also its weakness since it renders the scope of what to study problematic (Grzywacz & Fuqua, 2000). The scope of this study was, indeed, limited through using a case study design which must be acknowledged as a methodological limitation. However, it is argued that it was a necessary limitation at this initial stage of discovery.

The rationale behind the case study design was to limit the SE variation on a number of levels. At the policy level, the objective was to ensure that the study was conducted within a uniform national and local policy context. In this case, the LEA caterer, their working partners and the schools were subject to the Welsh Assembly Government's Appetite for Life programme (2008a). At the organisational level of the school, the emphasis was on a specific aspect of the HPS - the role of school meals in fashioning eating behaviour. At the inter-personal level, the objective was to explore the relationships between pupils and school meal staff, rather than peers or teachers. At the intra-personal level, the emphasis was on primary school children since the literature suggested that eating behaviours are relatively malleable at this age. It must therefore, be acknowledged that not *all* of the SE influences upon the policies

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concerned or on children's eating behaviour were within the scope of study. Whereas this may limit the applicability of findings, it facilitated an in-depth examination of some under-researched SE influences as a contribution to the wider knowledge base in the subject domain. These include the influence of organisational objectives and professional practices on policy; the reciprocal relationships between children (individuals) and policy; and, the potential to improve these through inter-personal and organisational processes that positively influence children's eating behaviour (intra-personal characteristics). Nevertheless, the limitation of the case study approach will be considered separately for each of the study's aims.

Aim 1: To understand the school meal context and its implications for nutritional policy and primary schoolchildren's (age 4-11 years) eating behaviour.

With respect to policy implementation, there are numerous examples in the public domain of multi-level influences similar to those reported in this study. For example, an inspection of the published menus/policy statements of other Welsh LEAs that are available via the internet suggests that localised decision making regarding whether or not to incorporate choices on the menu is not restricted to the study LEA. The same issue regarding choices on secondary school menus has been highlighted within media reports concerning the implementation of revised nutritional standards in England (see BBC, 2009). Just as the study LEA monitored the experiences of other LEAs, Northern Ireland is monitoring the experiences of the three other UK countries (Scotland, Wales and England) in advance of amending their nutritional standards (C. E. L. Evans & Harper, 2009). In England, where an additional level of socio-ecological complexity exists since local authorities outsource school catering (Department for Education and Skills, 2008), contractual and guidance documentation with respect to food availability has been reported as imprecise and open to interpretation (Nelson, et al., 2006). This suggests that local ecologies of practice may also be found at this SE level. Therefore, although the *specific* findings of the study may not generalise beyond the host LEA, they are important on a *theoretical* level since they define two *generic* sources of influence on the transformation into practice of national school meal policies: a) competing priorities and multiple external influences at the various organisational levels of service delivery; and b) individual influences arising at the point of food preparation, and during the inter-personal

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transactions between staff in the dining hall and the children. Meanwhile, with respect to aim 1 where the focus was on context defined as 'environment', even though the physical attributes of the dining halls studied were similar to those from a previous study undertaken in England (Pike, 2008), further research would be needed to establish whether the environmental features observed apply in other LEAs both in Wales and beyond.

Aim 2: To understand the techniques used by school meal staff during social interactions within the primary school meal setting which directly or indirectly impact the children's eating behaviours.

The evidence base regarding feeding strategies and eating behaviour which guided the data collection and analysis was drawn from literature primarily originating from the USA and the UK, therefore, the theoretical framework was not Wales-centric. However, the study demonstrated how *context* shaped the implementation of feeding strategies. Therefore, when expressed in broad terms, the main finding relevant to aim 2, could potentially be transferable – i.e., that policy and practice based on the appropriate use of feeding strategies within school dining halls may be widely relevant *provided* it is tailored to synergise with the context/culture of the host country as well as the host school. Nevertheless, further research is recommended in other LEAs, particularly those outside Wales.

8.2 Organisational influences on healthy eating policies

Organisational influences on healthy eating policy manifested themselves in the form of numerous pragmatic influences that acted as implementation barriers, together with the professional practices of staff at the final point of school meal policy delivery – the point when food is served to the child.

8.2.1 Barriers to implementing healthy eating policies

A complex route from policy to practice existed reflecting that previously found in mainstream education (Coffield, et al., 2007). Policies at each SE level complied with those higher in the organisational hierarchy, i.e. national policy directly influenced LEA policy which, in turn, directly influenced school policy. This ensured that the

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stipulations of national policy were considered during everyday working practices, but did not ensure that they were the dominant or sole consideration. This was due, in part, to each organisational level considering and incorporating additional policy items commensurate with their specific terms of reference. For example, LEA policies included commercial considerations such as protecting school meal uptake, and school policies reflected parental wishes. In addition, each organisational level would learn from the successes or failures of its peers as illustrated by the decision of the study LEA not to remove choice from school menus based on the experiences of another. As depicted by the vertical arrows in Figure 11, the relative proportion of national policy objectives decreased compared with the proportion of other priorities in each subordinate policy making level.

It was not just organisations that exerted an influence during the policy transformation process. The food made available during a particular lunchtime in a particular school represented the transition point where policy became practice. At this final stage in the process, the cook-in charge in each school had complete discretion regarding many of the specifics of what was offered. They were the final arbiters of ‘ambiguous’ menu items such as ‘seasonal’ vegetables; the substitution of unpopular items with more popular ones; the quantities of food that were prepared; portion sizes; and serving strategies for the additional fruit, bread and salad portions. These individualised practices illustrate tensions that can exist for professionals who are required to both implement policies and resolve practical dilemmas (Stronach et al, 2002) that may result in policies being mistranslated into practice (Coffield, et al., 2007).

As the various organisations and individuals considered and modified the national food availability policy within their various frames of reference, there was one factor that consistently warranted particular consideration - the issue of food choices (see Figure 11). At LEA level, policy makers were aware that menus needed to include items children were likely to choose otherwise they might opt out of school meals altogether. Thus, during the policy transformation process, the children’s eating behaviour afforded them an indirect but influential voice by virtue of their status as consumers (K. Brown, et al., 2000; Gray, 2008) which could threaten the financial viability of the service and, ultimately, its existence as a health promotion setting.

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Consequently, lunchtime menus incorporating choices were viewed as an enabler for service viability, whilst also recognised as a barrier to the promotion of healthy eating behaviours by limiting children's exposure to foods. On balance, for the study LEA, the merits of choice as a service enabler outweighed the risks of choice as a barrier to healthy eating. This role that choice played in the context of food availability exhibited two paradoxical features. Firstly, that choice restricts children's exposure to food, rather than extending it, since children eat familiar foods that they like (L. Cooke, 2007) rather than broadening their personal food experiences. The second paradox was that choice was deemed necessary to preserve the school meal service for health promotion purposes, whilst also recognised as deleterious to healthy eating.

Food choices also contributed to policy transformation at school level and at the level of the catering staff. Some schools opted not to offer choices on the menu if they felt it was impractical, possibly due to the children's abilities or to constraints within their lunchtime facilities. Similarly, children's choices influenced many of the catering decisions made by the cooks during food preparation. The final hurdle with respect to school meal policy implementation occurred at the point of service.

8.2.2 Policy to plate – the final hurdle

At the point of service, active management of the children's choice behaviours with respect to the foods that the various policies rendered available was a feature of the social interactions between catering staff and the children. How, or if, this was done reflected the personal styles of the staff rather than policies or guidelines. The style could be permissive (allow free choice); authoritarian (mandate a balanced choice); or authoritative (advise the child). This use of a preferred style within food related interactions has previously been observed in studies involving parents (Darling & Steinberg, 1993). This short period of social interaction between the server and the child was the final determinant of the nutritional content of the plate of food that the child actually received. However, there was little support or guidance with respect to this aspect of the role of catering staff.

Techniques that can be used to good effect in social eating contexts involving young children have been widely studied (Savage, et al., 2007). It is widely recognised that

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facilitating repeated taste exposures to unfamiliar foods is critical for developing healthy, independent food choices (L. Cooke, 2007). It is argued that the active, ongoing management of children's food choices by serving staff using these techniques is not only important from a health perspective, but may play an important role in ensuring that national school food transformation policies have the intended impact on the target population. Indeed, the modification of children's eating behaviour may be influential in mitigating existing negative relationships between children and healthy eating policy.

8.3 Reciprocal relationships between children and healthy eating policy

8.3.1 Current responses to healthy eating

Although the objective of the revised nutritional guidelines within school meal transformation policies is to improve children's health, children's resistances to the food represent a reverse, negative influence on the potential success of the policies concerned. The four most commonly observed (or reported) responses to healthy eating were dislikes; nutritionally poor food choices; reluctance to try unfamiliar food; and, picky/fussy eating, all of which have been previously reported in the literature (Cashdan, 1994; Dovey, Staples, Gibson, & Halford, 2008; Hamilton-Ekeke & Thomas, 2007; Wardle et al., 2003). This suggests that even if a nutritionally balanced meal is made available as required by the ongoing school meal transformation programmes (e.g., Welsh Assembly Government, 2008a), there is no guarantee that all children will eat all of it. A similar phenomenon has already been found in England (Gatenby, 2007). However, dislikes, poor choice and low consumption are also the outcomes that have been studied in previous literature on feeding strategies (e.g., Birch, Marlin, & Rotter, 1984; Birch, McPhee, Shoba, Pirok, & Steinberg, 1987; Galloway, Fiorito, Francis, & Birch, 2006). This indicates a need to improve the eating behaviours of school children which the data from this study suggests may be achievable through the use of feeding strategies by school meal staff, provided the dining hall context supports their use. The opportunity exists for catering staff to modify the nutritionally poor choice behaviours evident at the service point, yet the enhanced training recommended within the transformation programmes focuses on

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cooking skills rather than behaviour modification. Consumption, however, can only be addressed by supervisory staff within the main dining hall yet the transformation programmes make little reference to the role of midday supervisors. Consequently, school meal policy that focuses on improving children's eating behaviours in addition to food availability is recommended. Further reciprocity between the policy and intra-personal levels is evident within policy decisions to engage pupils during the implementation process.

8.3.2 Pupil engagement within healthy eating policy

Pupil consultation is integral to the implementation of national school food transformation programmes typically utilising School Nutrition Action Groups (SNAGs) (School Meals Review Panel, 2005; Scottish Executive, 2002; Welsh Assembly Government, 2008a). As SNAGS consist of both adult and child representatives, power relations and high cognitive demands may constrain the extent to which younger children are able to contribute. Therefore, four primary schools were asked to use their existing school councils, which are pupil-dominated bodies (School Councils Wales, 2009), to consider the broad question of how children might be encouraged to eat their school meals. The approaches adopted by the schools were talk-centred, and exhibited elements of structure (e.g., questionnaires and formal meeting formats) and adult influence (e.g., teacher/researcher interjecting probe questions). This contrasts with the less-structured, task-centred, child-centric approaches recommended to understand children's interpretations (Banister & Booth, 2005) and suggests that maintaining a child-focus to pupil engagement is challenging, even when utilising pupil-dominated bodies such as school councils. Further issues related to the topics the children focussed upon during their discussions.

A major part of the children's interpretation of the promotion of healthy eating related to food availability during school meals. In this regard, their viewpoint aligned with national policies which also focus on food availability, for example, revising the nutritional standards for school meals (C. E. L. Evans & Harper, 2009). However, whereas national policy is driven by a *health* agenda, the children were driven by a *personal choice* agenda. Consistent with previous research, the dominant, consensual theme that naturally emerged from all the school councils was that the children were

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aware of the concept of 'healthy' food but would only eat familiar food they liked (Dixey, et al., 2001; Savage, et al., 2007). School meal choices were expected to align with their existing food preferences revealing tensions between school food provision and desirability from a child's perspective. More practical ways of pupil engagement which incorporate broadening their experiences with food into the consultation process are recommended.

The children's discussions showed that their experiences of some aspects of school meal management were not supportive of either food selection or consumption (e.g., food running out and time pressures). The salience of the *service* aspect of school meals has not emerged from previous research with children. Given the prominence of primary school children's personal food choice agenda, coupled with their cognitive developmental stage, which may constrain their ability to make abstract associations between their eating behaviour and health outcomes (Contento, 1981; Piaget & Inhelder, 1969; Resnicow et al., 1997), the management of the school meal service may represent an area where pupil consultation is more beneficial than discussions surrounding food availability. Addressing the management issues perceived by children may represent an opportunity to mitigate the current adverse relationship between children's eating behaviour and healthy eating policy.

8.4 Improving child-policy reciprocity through organisational intervention

Opportunities to address the current negative relationship between children's eating behaviour and healthy eating policy by organisational interventions that focus on the dining hall context are suggested, particularly with respect to the child's eating experience and the roles of the principal actors that were identified in the dining halls.

8.4.1 The social dimension of the school dining experience

The importance of the social dimension of the school dining hall was illustrated by between-school differences in dining hall culture. This difference was particularly evident between two schools using the same dining hall, suggesting that the skills, attitudes, beliefs and behaviours of individuals are independent from the physical eating space in their contribution to the eating experience. The principal actors within

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the dining halls were identified as school meal staff, the children and school staff. This study has identified a number of barriers and facilitators associated with the skills, attitudes, beliefs and behaviours of school meal staff that could influence the success of policy initiatives.

The attributes of the school meal staff and their roles (see Table 22 and Table 23) suggest a number of opportunities to improve the integration of these staff within the school infrastructure and the whole school approach to nutritional education. Both catering staff and midday supervisors exhibited a strong group identity. In addition, supervisors appeared marginalised from the main body of the school and lacking in self esteem as evidenced by their reluctance to take up roles as school governors and possibly by their reluctance to be interviewed on school premises. They rarely had a formal job description or received performance feedback. This emphasises the importance of considering a role structure or activities that would include such staff in school life to foster a sense of belonging and self-worth. Training in cooking skills and food nutrition, primarily for catering staff, is an inherent part of existing national school meal policies (School Meals Review Panel, 2005; Scottish Executive, 2002; Welsh Assembly Government, 2008a). In addition, training courses for midday supervisors which incorporate the encouragement of healthy eating are being developed (e.g., School FEAST, 2009). The latter fall within the remit of school (rather than local/national) policy and budgets which adversely influenced their availability within schools. If courses were available, attendance was often at the discretion of the individual since any training, of necessity, took place outside contracted hours. Where discretion plays such a prominent role in the decision to engage in an activity, it suggests that attention needs to be paid to what might motivate individuals to do so (Ryan & Deci, 2000). Midday supervisors exhibited a strong sense of empowerment in that they independently managed much of the lunchtime, expressed high levels of job satisfaction, and spoke willingly and authoritatively during the interview process. This suggests the importance of devising training courses that improve and capitalise upon the intrinsic motivators within the role and utilise engagement mechanisms where power relations are kept to a minimum, improving rather than detracting from participants' self esteem. Participatory, workshop style training courses are, therefore, recommended. which

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explain HPS philosophy and the importance of school meal staff within whole school approaches to nutritional education. Furthermore, a SE relationship between the home and the school was identified in that midday supervisors used their experience of child-rearing to guide them in their role. Introducing reciprocity into this relationship through training programmes that impart knowledge equally applicable to the roles of parent or supervisor is recommended. Overall the role of catering staff and midday supervisors in particular have much to offer and may be under-utilised in policy initiatives.

The dining halls were mostly occupied by children. In most schools children sat in friendship groups, albeit segregated from children with packed lunches. In some of the schools, the lunchtime came across as a pleasant social experience. Older children were occasionally used as monitors thereby functioning as positive behavioural models. However, some negative peer influences were also evident, for example, regarding some choices made at the serving hatch, the decision to take a school meal or not, and children rushing their food to join friends already in the playground. Indeed playing, as opposed to eating, was often the most highly valued lunchtime activity. Promoting social interaction (School Food Trust, 2009b) and avoiding negative peer modelling (Greenhalgh, et al., 2009) are important for the development of eating behaviour. Furthermore, peer pressure is a significant influence upon a child's decision to have a school meal (OFSTED, 2010; Scottish Executive, 2002). This study confirms the need to attend to peer-related issues within holistic school meal approaches.

School staff did not play a prominent role within the social dimension of the dining hall despite recommendations that pupils and teachers share the same social space at lunchtime (School Food Trust, 2009b). The ratio of child:adult meals served was 125:1 and adult meals were mostly eaten outside the dining hall. However, it is questionable how feasible it would be to accommodate teachers in many dining halls which were already overcrowded, or to serve additional meals within the time constraints. In addition, although it is laudable that school menus are child oriented (e.g., fish fingers, chicken nuggets), it is arguably questionable whether such offerings would be appealing to all adults or prepare children for diets associated with adult life.

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Of concern was the potential for teachers to act as negative role models during observable acts such as wasting food, queue jumping and eating whilst standing up. It is important for holistic educational approaches that such avoidable negative messages are minimised. Teachers' terms and conditions explicitly state that they are not required to undertake midday supervision (Department for Education, 2010). Any duties that are undertaken are purely voluntary and contravene Trade Union policy (National Union of Teachers). Indeed, teachers are not even required to stay on school premises during the lunchtime... Although the formal inclusion of teachers in interventions that take place during lunchtimes may be problematic, opportunities exist to utilise routine teacher training courses to raise awareness about how children's nutritional behaviour develops, and how it is influenced (possibly unintentionally and adversely) by the actions of significant adults, such as teachers. In addition, although teachers may not be actively involved in school meal preparation and delivery, the reverse relationship may offer some potential. For example, children could learn about nutritional balance/food by learning about the running of their kitchen/dining hall as a more formalised part of the teaching curriculum.

Although parents were neither observed in the dining hall nor interviewed as part of the study (unless they were school meal staff who had children in the school), they had an indirect influence on the school meal experience at multiple SE levels. At the policy level, parental views were an important part of policy formation (see Figure 11). At the intra-personal level, the focus groups revealed that parents influenced children's attitudes towards the school meal, for example, by holding their cooking skills in high regard. There were also tensions at the organisational level between the home and the school. The eating behaviour of some children, particularly the new intake each September, was a common cause for concern. In addition, if a child consistently failed to consume their school meal, it was common practice to ask the parent to remove the child from school meal provision. Furthermore, many expressed the viewpoint that developing a child's eating behaviour was the responsibility of the home, not the school. These findings emphasise the importance of attending to reciprocal home-school relationships within holistic educational approaches.

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In summary, when considered from a socio-ecological perspective, the social dimension of the school dining hall revealed numerous opportunities to support children's acquisition of eating behaviours. However, given the diversity of actors, processes and relationships involved, policymakers may need to consider contested loci of responsibilities that holistic nutritional approaches may generate.

8.4.2 Resource implications on the school eating experience

Not all aspects of the children's school meal experience were positive. The numbers of children taking school meals (i.e. school meal uptake) conflicted with space availability in most dining halls giving rise to an eating experience characterised by overcrowding. Similarly, the need to free up dining halls for teaching purposes conflicted with the length of time allowed for lunch resulting in an eating experience characterised by time pressures. These space/time issues meant that most dining halls were mechanistic in that the end-goal was to get each child fed and moved into the playground so that their place could be re-used or cleared away. Midday supervisors worked under intense pressure with little time to encourage eating, particularly for junior children when playground duties took priority over the dining hall. The environment was more akin to a re-fuelling station than one where a child could learn to enjoy nutritious meals, together with table and social skills. Indeed, it was uptake and the length of lunchtime that impacted on feeding outcomes more so than numbers on the school roll (school size) as is the case with mainstream educational outcomes (Leithwood & Jantzi, 2009). This is a concern since increasing school meal uptake features heavily in government policies (School Meals Review Panel, 2005; Scottish Executive, 2002; Welsh Assembly Government, 2008a) and reducing the length of the school lunchtime is a longstanding trend which has received little attention in terms of its affects on eating behaviour (Blatchford & Sumpner, 1998; Nelson et al., 2006).

8.4.3 The physical dimension of the school dining experience

Physical characteristics, such as décor or crockery, together with adequate staffing are crucial for successful communal eating environments (I. Gustafsson, Öström, Johansson, & Mossberg, 2006). However, in the dining halls, equipment such as tables, seats, plates and cutlery were selected for convenience rather than their positive contribution to the eating experience. A multi-component intervention conducted in

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primary schools in England which improved the physical dining environment as well as the menu found that the children's learning behaviours in the classroom improved (School Food Trust, 2009c). With the current emphasis on the revision of nutritional standards for school meals (C. E. L. Evans & Harper, 2009), further research is recommended into the association between food availability, physical environment and eating behaviours.

When analysed for their influence on eating behaviours, the school dining halls revealed three distinct contexts with associated physical, social and temporal characteristics - the service area, the dining area, and the kitchen. The kitchen was excluded from the study as it was primarily associated with food preparation and availability which has less of a *direct* impact on eating behaviours (Rozin, 1989). In contrast, national school meal policies predominantly focus on activities associated with kitchens and food availability, such as ensuring the nutritional content of food and its procurement, with little emphasis on the serving and dining areas (C. E. L. Evans & Harper, 2009). This suggests that such policies may be at risk of only partially fulfilling their nutritional objectives, and may only partially exploit the opportunities presented by the dining hall environment.

8.4.4 The implications of contextual heterogeneity

Previous studies of the dining hall context have generally been part of process evaluations of nutritional interventions (e.g., Colquhoun, Wright, Pike, & Gatenby, 2008). However, this study was exploratory, rather than evaluative, with an objective to examine the dining hall context as a precursor to future interventions. The findings showed that the dining hall context was specific to an individual school and often, a particular day, and that the eating area was volatile, dynamic and unpredictable. Although team working between catering staff and supervisory staff was evident, the potential for the blurring of objectives, roles and responsibilities was high since staffing responsibilities were divided between multiple employers (LEAs for catering staff and individual schools for supervisory staff). Contextual heterogeneity has previously been reported as an issue within school based interventions leading to recommendations for a thorough understanding of each environment, coupled with inbuilt flexibility that can be adapted for specific settings (Patton et al., 2000) as a

'one size fits all' approach is unlikely to be effective. Given the highly dynamic context of a primary school dining hall, developing and implementing nutritional interventions will be challenging. Furthermore, active engagement with stakeholders (Summerbell et al., 2005) and school staff (Cho & Nadow, 2004) has previously been recommended. This study further highlights the importance of strategic partnership working with respect to the provision of school meals in that, at present, two critical groups of individuals, catering staff and supervisory staff, fall under the jurisdiction of multiple employers - the LEAs and individual schools respectively. Indeed, inter-personal processes involving these staff represent further opportunities to mitigate the adverse relationship between children's eating behaviour and healthy eating policy.

8.5 Improving child-policy reciprocity through inter-personal intervention

Naturally occurring inter-personal processes within the school dining hall are suggested as the basis for nutritional interventions that could complement current healthy eating policies by addressing children's negative responses to the healthier food being made available.

8.5.1 Feeding strategies used by school meal staff

Purposeful modelling of eating behaviours was almost wholly absent in all schools despite evidence of its effectiveness (Hendy & Raudenbush, 2000). As the children were in the dining hall to eat, and the staff/adults were primarily in the hall to work, the absence of adult-child modelling could be attributable to there being little commonality of actions upon which to base nutritional social learning. However, recent work by Lumeng and colleagues (2008) suggests that verbal encouragements can be effective in influencing children's food selection *without* being accompanied by modelling of the required act. Therefore the lack of opportunities for adult modelling in dining halls may not be such an issue when considered alongside the finding that verbal encouragements were the most prevalent form of feeding strategy.

Schools often required the child to eat their entrée before their dessert, and it was clear that the children were aware of this and mostly complied with it. Previous research has shown that where children are asked to 'eat *food A* then *food B*' as opposed to

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being presented with a contingent food reward ('if you eat *food A*, you can have *food B*'), the decrease in liking for *food A* associated with the reward scenario does not occur (Newman & Taylor, 1992). As other non-directed behavioural practices were also evident (e.g., queuing, seating), children in school dining halls may readily accept and comply with school-imposed norms to such an extent that the phenomenon could be used to positive effect with respect to eating behaviours.

Other types of feeding strategies defined in the literature include restriction, pressure and encouragement (Savage, et al., 2007). These were found across the sample, albeit with varying frequency and consistency per school/individual. Pressuring strategies were typically verbal 'must' have/eat requests rather than 'finish' directives. Indeed, anything perceived as 'force' was rejected. This differs in form and intensity from the pressuring strategies defined in the Child Feeding Questionnaire used as an instrument to assess parental feeding practices (e.g., eat 'all', eat after satiety - (Birch, et al., 2001)). The messages conveyed within encouraging strategies converged on four main types: a) to 'try' (i.e. taste) the food; b) requests to eat 'one more bit' or 'some of' the food; c) the delivery of health/nutritional messages; and d) making eating a fun context. These messages were not defined within formalised school rules nor did school meal staff receive training with respect to messages which were either appropriate or effective. Encouraging strategies also included rewards for achievement, sometimes in the form of verbal praise and sometimes as tangible rewards for consumption (e.g. stickers) in the case of supervisory staff. Therefore, although the feeding strategies used could largely be categorised as per the literature, their implementation reflected the constraints and opportunities of the context in which they were used and were not informed by formal guidance given to staff.

8.5.2 The role of repeated taste exposure

A further type of feeding strategy is repeated taste exposure (RTE) (Birch, et al., 1987). During analysis, none of the strategies were categorised as RTE, even though many of them could be construed as attempts to achieve tasting (e.g., 'try it' / 'eat one more bit'). This was a considered decision as there was no evidence that such techniques were knowingly, or repeatedly and consistently used as the literature describes. The absence of purposeful RTE is a concern since it modifies liking which

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strongly correlates with consumption (Birch, 1979b) and is important for longer term, independent food choices (L. Cooke, 2007).

There may, however, be a case to re-conceptualise RTE as the desired *outcome* of a feeding strategy rather than as an independent category. Theory would then suggest that if feeding technique could encourage a child to *taste* an unfamiliar food, liking for that food could increase (Birch, et al., 1987; Zajonc, 1968), thence, consumption (Birch, 1979b), and, by definition, choice. The dining halls readily offered opportunities for children to socialise with each other and with school meal staff who naturally used feeding strategies, primarily in the form of verbal encouragements, praise, rewards and the imposition of food norms. These could be viewed as attempts to achieve *tasting*, situated within a menu system which ensured that children were *repeatedly exposed* to nutritional foods. Therefore, more rigorous investigation of the effects of consistently using feeding strategies to achieve taste exposures in dining halls is recommended.

Some features of the methodological designs used by previous studies into feeding strategies (e.g., frequency/duration of application, reinforcement schedule, caregiver:child ratio) may differ in the natural school context, thereby questioning whether previous findings would be transferable. Although the optimum ratio of those delivering the strategy to those receiving it is not currently known, the ratios used in experimental settings were much higher than those observed in the schools. On the other hand, the findings suggest that an intervention based upon the use of naturally occurring feeding strategies embedded within the repeating menu cycles of nutritionally balanced school meals may improve upon the reinforcement schedules and application frequencies/durations used experimentally. Whereas parents found repeatedly achieving taste exposures in the home to be problematic (Wardle, Cooke, et al., 2003), initial suggestions are that it need not be so within school dining halls. Furthermore, recent research also suggests that the more foods children are exposed to, the less exposures are needed (Williams, et al., 2008). Therefore, an intervention based on promoting pre-existing staff behaviours may be theoretically informed, cost-effective, practical and sustainable, albeit, subject to any constraints inherent in the individual school context. Although this exploratory study did not set out to evaluate

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the outcomes associated with such an intervention, a number of associations naturally emerged from the findings that suggest what these may be.

By contrasting schools where school meal staff frequently used feeding strategies with those where they were rarely used (see Table 31) a number of associations emerge. Importantly, schools where feeding strategies were frequently used exhibited high levels of consumption. In addition, the children selected well-balanced meals that included fruit as dessert. Other attributes of such schools included authoritative approaches towards choices made at the service point and the presence of an influential individual in the dining hall who was passionate about nurturing eating behaviour. Conversely, in schools where consumption was low (i.e. high levels of waste and/or small portions served) feeding strategies were rarely used, serving staff were ambivalent towards the children's choices, and there was no-one actively promoting healthy eating behaviours. At this exploratory level of analysis it is, therefore, suggested that the supportive role of school meal staff may be an essential component of a whole school approach towards nutrition.

The school level data in Table 31 also showed that in three schools, school meal uptake levels (paid and free) were within 3 percentage points of each other i.e., uptake levels were similar despite observed eating behaviour being markedly different. This arguably raises two questions; a) what is school meal uptake indicative of? and, b) what contribution does school meal uptake make to health? With respect to the former, school meal uptake is commonly regarded as an indicator of children's healthy eating (Nelson, et al., 2009). However, the highest uptake figure within the sample (see Table 15) was 70.09%. This was the 'guest' school of the pair that shared dining room accommodation and had been allocated a thirty minute slot within the 'host' school to feed approximately 75 children out of the 107 on the school roll. This school had lost its own dining hall as a result of structural damage. As a result, space was at a premium such that it could not accommodate large numbers of children taking packed lunches. It is feasible that in this case, school meal uptake was an indicator of the school's accommodation problems more-so than a measure of healthy eating. Indeed, the factors known to contribute to pupil's decisions to take school meals are varied and complex (Nelson & Nicholas, 2006). Nevertheless, regardless of the reasons

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behind the decision to take a school meal, every child within the school meal system is a child whose health could potentially be influenced through improved nutrition. The importance of encouraging children into the school meal system has previously been recognised (Scottish Executive, 2002).

The second question posed relates to the contribution of school meal uptake make to health, i.e., once in the school meal system, is improved nutrition implicit? Table 31 illustrated that similar levels of school meal uptake were variously associated with high consumption and low consumption (i.e. high levels of waste and/or the serving of small portions). For food to contribute to an individual's health it has, by definition, to be ingested. No matter how nutritionally balanced the school menu is, or how high uptake figures are, if the food is neither served nor eaten, the health improvement value of a school meal is nullified. Scotland has reported that after several years of decline following the launch of its Hungry for Success programme, primary school meal uptake figures are beginning to recover (The Scottish Government, 2010a). From the, albeit exploratory, findings from this thesis, unless and until figures are available to show how much of this food is *eaten*, it may be premature to draw any conclusions regarding the success of such programmes from a health improvement perspective. Consideration may need to be given to the use school meal uptake *in combination* with food quantities not served/eaten as an indicator of intervention effectiveness.

School meal uptake statistics are not published in Wales and, in England, the derivation of 'uptake' has recently changed (Nelson, et al., 2009) such that trends dating back to the launch of the Turning the Tables programme are not available. However, Scotland has long term trend data (The Scottish Government, 2010a) from which some important inferences can be drawn. Firstly, assuming that the increase in primary school uptake to 50.4% is indeed indicative of secular change, 'quick fix' nutritional interventions are unlikely, and interventions that are not tested over the long term should not be recommended. Secondly, although primary school uptake is increasing, secondary school uptake is still in decline suggesting that the behaviours of older children are harder to influence. This emphasises the need for sustainable, cost-effective interventions delivered during the early years when the child's food preferences are the most malleable (Kelder, et al., 1994). Furthermore, such

interventions should be based upon a theoretical framework that has been shown to influence eating behaviour in this population.

8.5.3 Proposed theoretical framework for nutritional interventions

Early indications from this exploratory study suggest that an appropriate theoretical framework for future nutritional interventions in primary schools would be based upon mere-exposure theory (Zajonc, 1968) in conjunction with operant-conditioning (Skinner, 1974), classical conditioning (Pavlov, 1927) and/or Social Learning Theory (Bandura, 1977). In children, the robustness of behaviour change frameworks that rely upon cognitive elements associated with hypothetical, rationalistic thought has been questioned (Resnicow, et al., 1997; Umeh & Crabtree, 2006). This is because children are unable to undertake the abstract gain-loss associations (Piaget & Inhelder, 1969) required to conceptualise the long-term health outcomes of what they eat. Consequently, it has previously been recommended that future nutritional interventions aimed at children consider alternate frameworks such as operant conditioning, classical conditioning and social learning (Resnicow, et al., 1997). It is clear from the literature that these theories collectively explain children's acquisition of eating behaviour. Together with mere-exposure theory, they also underpin the extensive literature base regarding those feeding strategies which have been reliably shown to influence eating behaviour. This study has shown that these feeding strategies naturally occur within the dining hall and that those who employ them recognise the importance of repeatedly tasting food. Similar findings have previously reported within mother-child feeding relationships in the home (S. N. Moore, et al., 2007; S. N. Moore, et al., 2010) suggesting that they are not context specific. Exposure, classical conditioning, operant conditioning and/or social learning are therefore recommended as effective, age-appropriate theoretical frameworks for nutritional interventions with children. Whilst it is not always practical to follow the staged approach recommended by the MRC framework for the evaluation of complex interventions (Craig, et al., 2008) given significant policy and practice barriers, it is possible to conduct rigorous pragmatic effectiveness trials of policy interventions that meet both scientific and policy considerations ((L. Moore, et al., 2007; Murphy et al., 2010).

8.6 School meal policies – a partially holistic approach?

The premise behind Health Promoting Schools that utilise a whole school approach to educating children is that the child learns from their experiences throughout the school, including the dining hall (Parsons, et al., 1996). The HPS philosophy embraces 12 essential criteria whose objective is to promote health within schools (Health Education Board for Scotland, et al., 1996). As shown in Figure 4, the individual criteria operate at various SE levels and, in their totality, at all SE levels. As embedding analytical processes within the policy cycle is a core value of the HPS movement (World Health Organisation Europe, 2002), this thesis isolated one of these criteria (the consideration of the complementary role of school meals) and considered it from a SE perspective, making a number of recommendations regarding how school meals could further improve primary school children's eating behaviour. As several reviews have reported that HPS interventions often fail to embrace all SE levels (Dooris, 2005; Lister-Sharp, et al., 1999; Peters, et al., 2009), it is important to consider these recommendations holistically in the context of the HPS philosophy.

By seeking to understand the school meal context and its implications for school meal policy, the findings revealed a number of barriers associated with HPS criteria 8 and 11 relating to pragmatic influences on policy implementation and the practices of staff at the point of delivery (see Figure 17). In mitigation, a number of substantive recommendations were made associated with HPS criteria 1-5. In particular: a) the enhancement of pupils' self esteem (criterion 1) by considering how to meaningfully engage them within school meal consultations; b) the improvement of eating behaviour in a stimulating social context based on the relationships between pupils taking school meals and school meal staff (criteria 2 and 4); c) strengthening the social dimension of the eating experience by considering the role of catering staff (particularly midday supervisors) together with additional training required to support that role (criterion 3); and d) the improvement of eating behaviour by considering the physical attributes of the dining hall (criterion 5).

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Figure 17 Thesis recommendations and their relationship to the founding criteria of the HPS

HPS criterion studied within the thesis		
10 ¹	To consider the complementary role of school meals	
HPS criteria where barriers were identified		
8	To actively promote health	Section 8.2
11	To realise community based support services	Section 8.2.1
HPS criteria where opportunities were identified		
1	To promote pupils' self esteem by demonstrating that anyone can make a contribution to school life	Section 8.3
2	To develop good staff/pupil relations	Section 8.5
3	To clarify the social aims of the school	Section 8.4.1
4	To provide stimulating challenges for pupils	Section 8.5
5	To improve the physical environment of the school	Section 8.4.3
Other HPS criteria essential for a holistic approach		
6	To develop good links between school, home and community	Section 8.4.1
9	To consider the role of staff as exemplars	Sections 8.4.1, 8.5.1
7	To plan a coherent health education curriculum	
12	To develop the school health service beyond surveillance	

NOTES:

¹The numbering system used for the twelve criteria adheres to that originally published (Health Education Board for Scotland, et al., 1996) and presented in Figure 4

Although it is argued that these recommendations are *necessary* components within a whole school approach to nutritional behaviour, they are not, of themselves, *sufficient*. For example, health surveillance and health education are important components of health policy (DeBell & Everett, 1998) emphasising the role of HPS criteria 7 and 12 alongside the recommendations made (see Figure 17). Indeed, the importance of health education emerged from the pupil focus groups in that children demonstrated their knowledge of health related concepts (e.g., hunger, fitness) but also some misconceptions about what constituted 'healthy' food (e.g., ice cream). The importance of developing links between home, school and community was illustrated with respect to parental influence on school policy and children's attitudes; the contested locus of responsibility for eating behaviour; and, the influence of the media

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(it's coverage of Jamie Oliver in particular) on attitudes and beliefs at all levels (criterion 6). Difficulties associated with the role of (school) staff as exemplars also emerged with respect to the potential for negative role modelling and the constraints associated with staff dining alongside pupils (criterion 9). Similar issues with the role of peers as exemplars also emerged. Thus, the findings from the study illustrate the potential breadth and diversity of the influences on eating behaviour which emphasises the importance of behavioural change approaches that are both coherent (criterion 7) and holistic.

The importance of the holistic approach is also illustrated by considering some of the research that has been (and, indeed still is in many cases) ongoing during the timeframe of this thesis whose objective has also been to improve children's eating behaviour. For example, the revision of food-based standards in England has led to children eating less high-fat/salt/sugar food at lunchtime (Golley, Pearce, & Nelson, 2010). Ongoing research by the School Food Trust is exploring whether a family level intervention aimed at reducing the number of sweet foods eaten by young children can reduce the desire for sweet foods as the children grow older (School Food Trust, 2010). In Ireland, the Food Dudes programme, originally developed in Bangor University as a rewards and peer-modelling intervention (see Horne, et al., 1995; Horne, et al., 2004; Lowe, et al., 2004), has now been extended as a curriculum based resource to support pupils' social and health education (Bord Bia, 2011). The programme seeks to engage schools, parents and peers in healthy eating and enjoys a high-media profile. These studies illustrate the diversity of the health improvement approaches that are producing promising results. It is, therefore, important that the recommendations made within this thesis *complement* rather than *supplant* ongoing HPS activities, nutritional policies and interventions,

8.7 Quality of the research

Over and above the implications of using social ecology as a methodological framework discussed in Section 8.1.2, it is important to consider the quality of the research in terms of the methods used and their implications for validity, reliability and representativeness.

To explore the reciprocal relationships between policy and the intra-personal level with respect to engaging with young children, an unstructured approach was used for the child focus groups. A methodological decision was taken to ask school councils to consider broad questions relating to the promotion of healthy eating to gain insight into the issues that were important to the children, and the approaches that the schools would use to elicit them. The limitation of this unstructured approach is that it precluded systematic analysis of pre-formulated questions across the sample. An analysis of how the children reached their consensus positions was also not possible as the school councils largely functioned to report back on data that were gathered prior to the session. Nevertheless, the study has revealed some challenges associated with food-related pupil consultation that relies on traditional school approaches.

Validity in qualitative research is a consideration of whether the researcher sees what they think they see (Flick, 2004). Observing the entire dining room community potentially enhanced the data quality by allowing all the SE processes and relationships to be studied rather than a subset of selected factors. Some events were observable which could not be examined experimentally for ethical reasons, e.g. the effects of a negative social context on eating behaviour (Birch, et al., 1984), or which were so familiar, they may not have been mentioned in interview (Foster, 1996). However, the 'entirety' of the scene was not captured, for example, any processes not associated with school meals or eating behaviour as suggested by the research questions. The observation focussed on a number of areas of interest that were theoretically informed by the SE model represented in Figure 5 and the associated literature base. Although this could have jeopardised data quality should the initial theoretical focus be unsound, qualitative data collection techniques allow the researcher's assumptions and focus to be adjusted as the research progresses (Willig,

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2001). This occurred, for example, regarding the frequency of feeding strategies based upon the imposition of behavioural norms (see Section 7.3.2) which became a part of the observational focus that was not suggested by the literature.

Data validity may be compromised by the researcher misunderstanding what is observed (Gold, 1958). This was offset by including a series of interviews allowing those observed to expand upon their perspectives and intentions, and to check the interpretations of the observer. The observation schedule was marked to indicate areas which were subsequently clarified or expanded upon during the interviews as a required element of the interview schedule (see Appendix D13). In addition, the interviews enhanced the richness of the data by supplementing it with data gathered using a complementary approach. However, 'interviewer effects' can compromise the validity of data gathered via interviewing (Miller & Brewer, 2003), for example, the interviewee may give answers they believe the researcher wants to hear. Indeed, there were discrepancies between the frequency with which midday supervisors encouraged children to eat as inferred from their interviews and observed in the dining hall. The use of complementary data capture methods overcame such issues.

Validity may also be compromised by the participants behaving differently due to the presence of the observer (Foster, 1996). Overt observation was required for ethical reasons but participant reactivity was reduced as much as possible by being unobtrusive and allowing a reasonable time delay between giving out information sheets and conducting the study. Other techniques adopted to reduce reactivity included a conscious decision not to include the researcher's photograph on the child information form, and asking staff to identify children not participating in the study rather than asking them to wear badges. It is also acknowledged that researcher bias may influence what is observed, what is analysed and how it is interpreted (Gibbs, 2002). Biased transcription and interpretation, ignoring negative cases, vague concepts or codes, inconsistently applying codes to data and unwarranted generalisation are all examples of researcher bias. Any researcher bias is open to scrutiny in the form of the theory presented in the literature review, the structuring with the interview and observation schedules, and the audit trail of the analysis process (Foster, 1996). The risk of omissions due to the observer's memory lapses was offset by taking notes at

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the time and the writing of full fieldnotes immediately after the observation session. As observations could only take place during lunchtimes, there was ample time between observations to facilitate this. Reflexivity is a process of critically assessing the extent to which the researcher influenced the data (Miller & Brewer, 2003). A set of reflexive notes were maintained and reviewed throughout the study to allow the role of the researcher in the research process to be captured and assessed. It was considered important to reflectively assess the data collection process and adjust the procedures to cater for any sensitivities or issues that become problematic. Some reflections on researching in the field are presented in Section 8.8.

Reliability meanwhile, is an aspect of data quality which considers whether the same data, if gathered and analysed by different researchers using the same methods would generate the same findings (Willig, 2001). All data collection was undertaken by one researcher (the author) which was a pragmatic decision due to the research having been undertaken for a PhD thesis. The disadvantage of this is that inter-observer reliability was not assessable, albeit each school was observed on multiple days to allow some 'checking' to take place. An alternative approach for future studies may be to use multiple observers, although in some schools, extremely cramped dining hall conditions would make this infeasible. Although not all qualitative researchers agree about the extent to which reliability should be a concern for qualitative research (Willig, 2001), steps were taken to include a degree of uniformity into the design. The data capture involved multiple sessions per school and multiple schools using an observation schedule. Similarly, reliability of the interview data was improved using a semi-structured approach to ensure that key topics were discussed with all participants.

Representativeness is an assessment of whether the sample is representative of the general population such that data is of sufficient quality to allow the findings to be generalised (Willig, 2001). The methodological implications of the case study approach adopted by this study were discussed in Section 8.1.2.1. However, it was considered important that the findings should be representative within the LEA concerned. To achieve this, school size (i.e. number of pupils) and free school meal (FSM) entitlement were selected as characteristics that would differentiate school

populations. The sample was heterogeneous across these characteristics. In addition, the technique of theoretical saturation was adopted for the data collection to ensure that sampling and data collection continued until categories ceased to be discovered (Willig, 2001). This was particularly important regarding the midday supervisors interviews where initial participation rates were low but where data saturation occurred quickly.

8.8 Reflections on researching in the field

My reflections on researching in the field primarily centre round ethical issues, language issues, my experiences as a researcher and some implications for future research. The ethical considerations of observing children in a private setting were presented in Section 4.5 and primarily reflected the requirements described in various literary sources. These sources emphasise the need to obtain informed consent from all participants – what they tend not to do is to supplement this with practical advice. Some burning questions were obvious from the outset. What am I going to do if even *one* child who would normally eat a school meal is withdrawn from the study? What do I do if someone unexpectedly enters the scene? I was confident that someone would have encountered the problem before and could direct me to some sources of best practice. For example, how do educational researchers observing in a classroom approach this issue? I was expecting copious amounts to have been written on this, but I was wrong. During data collection, I followed my own consent protocol diligently, and I was lucky that very few children were excluded by their parents. I decided to ask staff to point these children out to me so I could make sure I ‘excluded them from my fieldnotes’. In reality, these became the children that I attended to more than any others, as I always needed to know where they were and what they were doing. Even worse, in one school, the *only* child who approached me was the excluded child. Paranoid that this would provoke an incident if the parents found out, I notified the headmaster who smiled and said that knowing the child in question, he would probably have predicted that and I should not worry. Boden, Epstein and Latimer (2009), warn that the definition of good research in the social sciences may be at risk of becoming a measure of its compliance with ethical rules and procedures. The authors state that their aim was to ‘provoke debate’(Boden, et al., 2009, p727). I would add to the debate by suggesting that when it comes to research ethics, the

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amount of theorising and philosophising in the literature is not matched by the amount of practical advice that is available.

In contrast, whilst assisting the LEA during the recruitment of an Appetite for Life Project Support Officer (see Section 8.9), in conjunction with a senior catering manager, I observed candidates interacting with staff and children in a primary school dining hall. Candidates had been asked to collect data and submit a report on the techniques that were being used to encourage the children to eat. This activity was not subject to the ethical considerations that apply to academic research. However, standards of what I would describe as ‘professional courtesy’ were maintained throughout and applied to everyone with whom we had contact. So what difference did it make? Consent was obtained from the headteacher, albeit, it was not written, but it was not obtained from any one else. The consent procedure was, therefore, much quicker and did not incur a financial cost. During the session, we could attend to whatever or whomever we pleased. For me, this felt much more relaxed – I could concentrate on what I was there to do, i.e. watch and learn. I cannot assess the resultant implications on data quality as there is no way of knowing how many children would have been excluded had formal consent protocols been applied. I do not believe anyone was harmed, that privacies or human rights were violated. Common sense prevailed.

Reflecting on an incident that occurred during the pilot study resulted in a change to the study design. The incident was a series of phone calls from an irate parent who stated that I was ‘breaking the law’ by potentially excluding his children from focus groups because I had intended to conduct them in English, not Welsh. As this was a fairly serious allegation, I consulted the Welsh Language Society who were able to clarify the situation (and who, fortunately, were familiar with the extreme views of the parent in question). By law, in Wales, information sheets and consent forms must be bilingual. However, the position of the Welsh Language Society is that Universities should strongly encourage all research projects to have bilingual researchers. Although this is done where possible on studies conducted in Wales, for student-led research, such a policy would appear problematic, especially in a cosmopolitan University such as Cardiff. In my case, the incident prompted me to reconsider my

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decision to exclude Welsh speaking schools from my sample, which, on reflection was a positive outcome. The research was as easy to conduct in the one Welsh medium school that was included in the (random) sample as it was in the English medium schools. Language issues were also at the heart of another incident that prompted some reflection.

During recruitment, a headteacher of a school in Q4 inquired about the languages my information sheets were available in. I (proudly) advised her that they were available in Welsh as well as English. She replied that all communication within her school required translation into seven additional languages as many parents spoke no English. The headteacher was very keen to be involved and suggested that excluding her school on the basis of language would introduce a source of bias. We discussed solutions that included the school providing a translation service, or reducing the scope of the study to omit the observation and restrict the data collection to interviews with adults. Sadly, the headteacher ultimately declined participation but the learning experience for me was invaluable.

Whilst observing in the field and of interacting with participants, I was conscious of how I was influencing the scene or the answers to my questions. Most children seemed accustomed to being watched. I was often asked 'Are you an inspector Miss?' The midday supervisors, however, were much more wary and I felt that a significant amount of relationship building would be needed for them to relax in my presence. In contrast, once removed from the environment during one-to-one conversations they were, without exception, open, honest and knowledgeable. Generally, the dining halls were so busy that the presence of an additional observer was almost inconsequential. Sometimes, they were so cramped that it was difficult not to get in the way. Did anyone act differently because I was there, and were my findings compromised as a result? The reality is that I will never know. I know I acted differently in the various schools. In a couple, the children's behaviour was somewhat intimidating and I was conscious of avoiding some children as a result. In one, I was intimidated by the headteacher from our very first conversation. She made me feel like a naughty schoolgirl. Did she really have to pick my observation days to visit the dining hall

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herself? Did I really have to get stuck in traffic on the day of our interview – the *only* one I was late for? Was I surprised that she refused to be tape recorded?

In sum, many of these reflections have potential implications for future studies within schools or school dining halls. Without doubt, not to incorporate both observation and interviewing in the design would be wrong. As they say, ‘seeing is believing’ but ‘your eyes can deceive you’. For primary school dining hall observations, two researchers per session would be preferable as lunchtimes are so dynamic and intense. An invaluable lesson was learned as regards engaging with supervisors. Should each school be visited multiple times over the course an academic year? I believe that one 2-3 day visit per school is sufficient for a study that spans an entire academic year. Unfortunately, September seems to be a no-go area for school based research due to issues associated with the new intake. For a study looking at eating behaviour, the September period is of particular interest and, therefore, should form a specific line of interview questioning. Other periods when access is difficult are Christmas and the end of the summer term. Although this had limited impact for this study, for other research topics it may not be the case. Access is, of course, at the discretion of the headteacher and I found schools in the most socio-economically deprived areas the hardest to recruit. Two practical solutions are suggested – to allow plenty of time for recruitment during project planning and to have the capability to translate information sheets into multiple languages as it is not safe to assume that all parents can speak English. Although not tested, I believe LEAs would be willing to help with this.

PhD students are often primed to expect a question in their viva regarding whether they encountered any surprises in their fieldwork. I first experienced this particular ‘field’ many decades ago. My recollections of a primary school dining hall were of a vast room where several hundred children would eat their food alongside their teachers with one dinner lady to supervise them. Beyond that, I had no pre-conceptions about what to expect except that the context was one that had somehow become problematic. Nevertheless, I was shocked by how poor some of the children’s plates were. It was also concerning to see how vulnerable many of the children seemed, particularly the very young ones, those with special needs or those who clearly struggled with their food. I was not expecting to be able to perceive a unique

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culture within each school, nor that two very different cultures would be perceived within the same four walls as in the case of the schools sharing accommodation. I was surprised by how chaotic a typical lunchtime seemed, saddened by how dis-engaged from the context teachers were, and by how the dedication and potential of many of the midday supervisors was being overlooked.

One final reflection – do I feel that my research made an impact? I believe it did and also that it has the potential to be developed further (see Section 8.9). However, I question whether in 2010 my consent protocol would gain ethical approval as pupil-post is no longer regarded as an appropriate means of seeking parental consent. The postal service is now the preferred means of parental communication. I could not have absorbed such costs out of my studentship. Is this type of study feasible for (non-case) PhD studentships any more? If not, what are the associated implications for the longer term research impact if such small beginnings are lost?

8.9 Knowledge transfer – from thesis to practice

In June 2007, a close working relationship with the case study LEA began whilst parental consent for the children's participation was being sought. One parent who received an information sheet was the Appetite for Life (A4L) co-ordinator within the LEA's catering department. This was the period immediately before the A4L launch and the LEA were preparing to collect baseline data from schools in anticipation of monitoring outcomes of any future A4L activity. These were to be quantitative data relating to the quantities of food prepared and eaten. The qualitative data that this study would generate were seen as complementing the LEA data, consequently, the LEA proposed a collaborative relationship. As a direct result, when formal recruitment for the main study commenced, the LEA was approached first and consented to take part in the study.

During February 2008, midway through data collection, the LEA requested that preliminary findings be presented at a scheduled monthly meeting of catering managers. At this time, the data analysis relating to aim 2 (i.e. the feeding strategies used by school meal staff) was the most advanced and was used as the basis for the presentation. Particular interest was generated in the naturally occurring opportunities

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to use verbal praise and encouragement as a means of encouraging the children to eat. The meeting coincided with a call from the Welsh Assembly Government (WAG) for LEAs to bid for funding for projects which supported the aims and objectives of the Appetite for Life (A4L) programme (Welsh Assembly Government, 2008a). The meeting decided to request A4L funding from WAG for a pilot study based on the emerging research using myself as an expert advisor. The bid was successful and was sufficient to underwrite a two-year post for an A4L Project Support Officer (A4LPSO).

The terms of reference for the expert advisor role were to assist in the recruitment of the A4LPSO post; prepare an advisory programme of work for the successful candidate; and, to provide advice relating to the pilot study both during its design and implementation. The A4LPSO was recruited in October 2008 and commenced the project with an exploratory phase to build relationships with schools, familiarise themselves with the environment and its issues, and confirm the thesis findings (the LEA remained blind to the schools that had participated in the thesis throughout). At this level, the collaborative relationship was mutually beneficial in many ways. The LEA gained practical research experience that was theoretically informed by emerging data from an ongoing academic study. The study was able to make an immediate impact and confirm its findings with data gathered from another source. Professional collaborations between practitioners and researchers are, therefore, recommended. The collaboration in this case was later extended to include Cardiff University.

During November 2008, the LEA agreed to collaborate with the Cardiff Institute of Society, Health and Ethics (CISHE) in a grant application for a feasibility study to build upon the pilot study. One output of this collaboration was the design of the **Brief Intervention to promote repeated Taste Exposure (BITE)**. Informed by the PhD findings and the ongoing exploratory work within the LEA, the intervention was designed as an audit that would be conducted in schools by a 'Food Champion' – in this case, the A4LPSO. The audit would produce an action plan of potential activities in a number of key categories:

- the dining space (e.g. cutlery, plates, table cloths, overall ambience)
- lunchtime management (e.g. timing, management of student throughput)

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- promoting healthy eating (e.g., taster sessions, information sessions)
- social relationships (e.g. role modelling by staff/peers, conviviality)
- school meal staff / pupil interactions (verbal encouragements and praise)

The action plan would then be discussed by a SNAG which would assume ownership of it, and select one action from each category to progress. The grant application proposed that a pilot study would be undertaken by the LEA, and at the LEA's cost to evaluate BITE in three schools which they would select. CISHE would then conduct a feasibility study which would take the form of an RCT involving a further eight schools (four intervention schools and four control schools) and a nested process evaluation. The timeframes within the project plan for the feasibility study were defined to allow the A4LPSO to deliver the BITE intervention within the contract period for the post as originally funded by WAG. They were, therefore, inflexible.

During May 2009, the initial grant application was short-listed for further consideration by the funding body in October 2009. However, this timescale conflicted with the BITE project plan which required the commencement of baseline data collection in September 2009 in order to allow the A4LPSO to deliver the intervention within the period of their contract. To resolve this conflict, interim funding was obtained from another source to cover the baseline data collection. The main grant application was amended accordingly and resubmitted. In August 2009, the recession in the UK resulted in the LEA withdrawing from the project. Nevertheless, interest was expressed from the Healthy Schools Co-ordinators in two Local Health Boards in Wales to work in partnership with CISHE in delivering the BITE intervention within their schools. In this scenario, the food champion role was to be undertaken by Healthy Schools co-ordinators. In October 2009, however, the main funding application was declined. Consequently, the baseline data collection did not commence and the interim funding was not taken up. Nevertheless, the potential remains to build on the recommendations made within this thesis and secure funding to work in partnership with practitioners in the field in order to synergise with public health policies and improve the eating behaviour of primary school children.

8.10 Conclusion and implications for policy and practice

8.10.1 Transforming policy into practice

Government policy (C. E. L. Evans & Harper, 2009) has targeted the school meal service as a means of improving nutritional intake and children's eating behaviour. The findings show that the food that is actually available for the primary school meal is dependent on national policy and subsequent multi-layered processes whereby organisational and individual experiences and ecologies of practice influence local implementation. This suggests that higher level policy interventions may be limited in their effectiveness if they are undermined by a lack of attention to lower level factors that may compromise their successful implementation. Effective public health interventions require a multi-level systems approach to understand the process of change, potential barriers and facilitators, and necessary supporting actions at different levels of the socio-ecological framework (McLeroy, et al., 1988). Therefore, the critical role of school meal providers, school cooks, lunchtime supervisors and the children themselves needs to be recognised and strategic partnerships developed to minimise the perceived and real tension between improved nutritional standards and school meal uptake. Without such a focus school meal policy may not have the desired impact on children's dinner plates.

On a more practical level, serving staff are the final link in the chain between the menus that are designed and the food that is prepared and (potentially) selected by the children. Similarly, midday supervisors are the final link in the chain between the food on the plate and the food that is (potentially) eaten by the children. As any chain is only as strong as its weakest link, the importance of the role played by school meal staff is emphasised. Interventions designed to promote the active, ongoing management of children's eating behaviours by school meal staff using the techniques studied within this thesis have the potential to add synergy to the current food transformation programmes. In this way, policy and practice could work more closely together to ensure that children learn to consume the nutritionally balanced lunch that is made available to them.

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Whereas research methodologies incorporating unstructured, child-centric approaches to elicit children's viewpoints are recommended, practical approaches to pupil engagement tend to incorporate structured formats and adult influence, even when utilising pupil-dominated bodies such as school councils. As food availability was the dominant concern of the children who expected school meals to align with their existing, possibly limited, food experiences, more practical ways of pupil engagement which incorporate broadening their experiences with food into the consultation process are recommended. In contrast, the management aspects of the school meal service where children's existing experiences are paramount may represent an area where pupil consultation is informative.

Finally, this study has highlighted a number of specific confounds within the school dining hall setting that pose a risk to the success of policy initiatives. In order to fully exploit the potential of school dining halls to promote healthy eating, it is recommended that policy places a greater emphasis on factors such as the eating environment; the time available for eating; the role of the midday supervisor; and, training of all school meal staff in the promotion of choice and consumption behaviours.

8.10.2 Improving the eating behaviours of primary school children

Although national policy requires nutritionally balanced school meals to be available, it is evident that dislikes for the food on offer, low consumption and poor choices are prevalent amongst the children. Consequently, school meal policy that focuses on improving children's eating behaviours in addition to food availability is recommended.

School meal staff utilise feeding strategies that match categories found in the literature, although their implementation reflects the constraints and opportunities of the context in which they are used. The most commonly used techniques are verbal encouragements and praise. It is also common to impose a norm that an entrée must be eaten before a dessert. As other non-directed behavioural practices are also evident (e.g., queuing, seating), children in school dining halls may readily accept and comply

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with school-imposed norms to such an extent that the phenomenon could be used to positive effect with respect to eating behaviours.

As repeated taste exposure is known to increase liking for foods, and liking is associated with consumption, the naturally occurring feeding techniques utilised by school meal staff could be harnessed to encourage children to *taste* the nutritionally balanced schools meals that government initiatives will *expose* them to. Therefore, more rigorous investigation of the effects of consistently using feeding strategies to achieve taste exposures in dining halls is recommended. An intervention based on promoting such pre-existing staff behaviours would be theoretically informed and may be cost-effective, practical and sustainable, albeit, subject to any constraints inherent in the individual school context.

8.10.3 Operationalising the socio-ecological health improvement model

The McLeroy model is posited as a framework for identifying health improvement leverage points and analysing health improvement initiatives. This study confirms its utility as a theoretical and methodological research framework to both inform and ensure consistency throughout the research lifecycle. Furthermore, the SE structures, processes and relationships conceptualised by the model naturally emerged from the findings, reconfirming the validity of the model. As a framework for exploratory research, however, it may be necessary to limit the scope of the SE influences considered, for example, by adopting a case study approach, to facilitate the identification of the relative importance of these influences. In this way, scrutiny of naturally occurring contexts to identify and optimise the SE processes within them may provide sustainable, cost effective solutions across a range of domains which includes, but is not limited to, nutrition and health.

Reciprocity within relationships is pivotal to the McLeroy model. This study highlights how the SE framework identifies potential stakeholders and gatekeepers for the research process which can then develop into a mutually supportive relationship that facilitates not only the research, but also stakeholders' professional objectives. Research networks involving practitioners and researchers are, therefore, recommended. To support this recommendation and ensure that research impacts are

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optimised, funding bodies may need to recognise, and be responsive to, the practical implications associated with synchronising the agendas of research, policy and practice.

Appendix A Glossary of terms

Age standardisation

A mathematical adjustment applied to a variable upon which age has an influence (e.g., mortality) to allow comparison of that variable across different sub-groups (e.g, socio-economic status) without age being a confounding influence.

Behavioural norm

A pattern of behaviour considered as typical.

Body Mass Index (BMI)

A measurement of overweight or obesity that accounts for differences in height. It is calculated as weight divided by squared height (kg/m²) but cannot distinguish between body mass due to fat and that due to muscle.

Cardiovascular Disease

A condition that includes angina or heart attack (collectively known as ischaemic heart disease or coronary heart disease), stroke, heart murmur, irregular heart beat or any other heart related condition.

Classical conditioning

An unconditioned response (UR) is a reflex to a stimulus (the 'unconditioned stimulus' or US). Classical conditioning is said to have occurred when the same response (the 'conditioned response' or CR) is elicited by a new stimulus to which the organism is initially indifferent (the 'conditioned stimulus' or CS), having been paired initially with the US (Pavlov, 1927)

Coronary heart disease (CHD)

Angina or heart attack (also known as ischaemic heart disease)

Dietary Reference Values (DRV)

The nutrient requirements for a group of individuals are assumed to be normally distributed. The notional mean of this distribution represents the Estimated Average Requirement (EAR). The Reference Nutrient Intake (RNI) is calculated as 2 notional standard deviations above the EAR such that intakes above this level will almost certainly be adequate. The Lower Reference Nutrient Intake (LRNI) is calculated as 2 notional standard deviations below the EAR such that intakes at this level will meet the needs of some individuals

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within the group. Intakes below this level will almost certainly be inadequate (Department of Health, 1991).

Ecology

The study of the relationships between people, animals, plants and their environment

Equivalised household income

Household income divided by a score derived from the number of individuals in the house (weighted to take into account, for example, the age of dependant children). The result is then assigned to quintiles. The measure is often used as an indicator of socio-economic status.

Estimated Average Requirement (EAR)

Estimated average requirement of a group of people for energy/protein/vitamins/minerals. About half usually need more than the EAR, half less (Department of Health, 1991).

Evaluative conditioning (EC)

EC involves an unconditioned stimulus (US) (e.g. nausea) eliciting an effective unconditioned response (e.g. taste aversion) such that the same conditioned response is induced for a conditioned stimulus (e.g. food) presented contingently with the US (Rozin, et al., 1998).

Extrinsic sugar

Sugar that is not contained within cell walls, e.g., table sugar, honey, glucose and glucose syrups, sugars added to food, sugars in fruit juices and lactose in milk and milk products (Department of Health, 1991)

Feeding strategy

A technique adopted by an individual, usually an adult, whose objective is control or encourage a child's eating, also referred to as a feeding 'practice' in some literature.

Food neophobia

Neophobia is an avoidance behaviour occurring as a reaction to a new object (Barnett, 1963), such as a novel food.

Food schema

A cognitive structure that defines food related expectations e.g., that unfamiliar foods are not likeable

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Forced consumption effect

Negative food associations resulting from powerful negative social experiences resulting from being forced to consume food.

Formal curriculum

The content of the formalised teaching delivered to children through classroom or lesson based instruction.

Hidden curriculum

The social environment of the school which is essential for achieving consistency between the formal curriculum and those aspects of school life, such as nutrition, where learning is put into practice (Denman, 1999).

Homeostasis

The maintenance of metabolic equilibrium by several complex biological mechanisms that operate via the autonomic nervous system

Human ecology

A holistic approach to the study of human organisation which acknowledges that human behaviour is influenced by, and influences, environmental structures.

Instrumental eating

Scenarios where eating is a pre-requisite for obtaining a reward (Birch, et al., 1982)

Ischaemic heart disease (IHD)

Angina or heart attack (also known as coronary heart disease)

McLeroy model

This is an abbreviation adopted by this thesis to refer to the socio-ecological health promotion framework proposed by McLeroy, Bibeau, Steckler and Glanz (1988).

Modelling

A process whereby human behaviour is learned by observation as a result of basing one's own actions on those of another. It is a central principle of Social Learning Theory (Bandura, 1977).

National Statistics Socio-Economic Classification (NS-SEC)

A social-classification system based on occupational categories commonly used to assess socio-economic status.

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Norm

A standard, model or pattern considered as typical.

Normative expectation

A normative expectation is a perception about behaviours expected by significant others (Cullen, et al., 2001).

Non-milk extrinsic sugars (NMES)

Extrinsic sugars except lactose in milk and milk products (Department of Health, 1991). They are thought to be a large contributor to dental caries.

Non-starch polysaccharides (NSPs)

Complex carbohydrates, other than starches, found in foods which form a major part of dietary fibre.

Obesity

A BMI of 30+. A sub-category of morbid obesity is often used to refer to a BMI of 40+.

Operant conditioning

An operant behaviour is one which is voluntary and has consequences for the individual which may be positive (e.g., satiating hunger) or negative (e.g., illness) (Skinner, 1974). The likelihood of operant behaviours re-occurring is influenced by these consequences through a process known as operant conditioning.

Overweight

A BMI of 25+ to less than 30.

Peer / peer group

A child's peer group is the group of children roughly equivalent in development to the child (Schunk, 1987).

Picky eating

Eating a limited variety of foods, being less ready to accept new foods, requesting specific food preparation methods and having strong dislikes (Jacobi, et al., 2003).

Recommended Daily Amount (RDA)

The average amount of a nutrient which should be provided per head in a group of people if the needs of practically all of the members of the groups are to be met.

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Reference Nutrient Intake (RNI)

An amount of a nutrient that is enough, or more than enough, for about 97% of people in a group (Department of Health, 1991)

Scottish Index of Multiple Deprivation (SIMD)

The Scottish Government's official measure of area based multiple deprivation. It is based on 37 indicators across 7 individual domains of current income, employment, housing, health, education, skills and training and geographic access to services and telecommunications. SIMD is calculated at data zone level, enabling small pockets of deprivation to be identified. The data zones are ranked from most deprived (1) to least deprived (6505) on the overall SIMD index. The result is a comprehensive picture of relative area deprivation across Scotland. (The Scottish Government, 2009b)

School meal staff

The catering staff together with lunchtime supervisors (sometimes referred to as midday supervisors).

School meal uptake

The number of children taking school meals, both paid and free.

Social conformity

Changes in behaviour or opinions as a result of real or perceived pressure from another (Aronson, 2003).

Social ecology

An ecological perspective which emphasises the dynamic social inter-relationships between individuals and the environment

School council

A pupil-led body that involves all pupils in the consideration of school issues that affect them (School Councils Wales, 2009).

Social learning

This occurs as a result of observing the behaviour of others and its consequences for them i.e. behaviour is 'modelled' on that of others. (Bandura, 1977).

School Nutrition Action Group (SNAG)

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A school specific body that meets to discuss matters related to school nutrition. Typical members may include school staff, parents/governors, pupils and community partners.

Appendix B Literature review search strategy

The literature review and the search strategy on which it is based evolved in parallel, each informing the other over the course of the study. The search strategy was underpinned by three main techniques: a) the use of computer based search engines and keywords; b) snowballing; and, c) information received from others.

The use of computer based search engines was the primary search technique in that it was the starting point of the process and also the principal means of defining (and refining) the scope for each of the search techniques and, by definition, the thesis itself. The search engines used were:

- Electronic databases including ISI Web of Knowledge Service; OVID (psycINFO); the Cochrane library; British Education Index (BEI); PubMed
- Cardiff University Voyager Library Catalogue
- Google Scholar
- Google

Grey literature (i.e. literature not published within academic journals) was an important source of information, therefore, searching within SIGLE (System for Information on Grey Literature in Europe), for example, using 'school meal*', as a keyword was important. A number of websites were highly relevant sources of information. Therefore, their internal search engines were also used. The websites included:

- Department of Health
- Office for National Statistics
- School Food Trust
- Welsh Assembly Government

The keywords used within the various search engines emanated from an initial scoping exercise whose objective was to produce a high level map of the factors known to influence children's eating. The scoping exercise was partially informed by the Masters dissertation into the feeding strategies used by mothers of pre-school children which preceded this thesis (S. N. Moore, 2006). This previous study

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functioned as one initial source of relevant literature, keywords and authors. Examples of some baseline key words are:

- Food choice*; food preference*, liking, feeding strat*, eating behav*, eating practice*, healthy eating*, nutrition*, feeding style*
- School*, cater*, curriculum*, menu*
- Famil*, parent*

Author keywords were also used whenever it become apparent that researchers had multiple publications within relevant topic areas, for example, Birch LL, Wardle J.

One important outcome from this search technique were those searches that produced no hits or nothing of relevance, for example, school size, midday supervisor. This was either indicative of a research gap, or of information that was relevant to the study but had not been given prominence within the keyword or abstracts of publications. Information relating to theses subjects was often discovered by reading or scanning other literature, usually at times when it was not specifically being searched for. One example of this is information relating to the length of school lunchtimes.

Snowballing was a searching technique that involved following leads within literature or information sources already identified as relevant. For example, scrutiny of the bibliographies, author list and keywords within previously published material. The literature base identified for the Masters dissertation which preceded the study was an important starting point for the snowballing activity. Other starting points included Weblinks embedded within relevant websites; the root sources of media stories – which were common given the topicality of school meal and obesity related stories; and following up on presentations given at conferences attended, for example, the British Feeding and Drinking Group and the British Sociological Society Food Study Group.

A subtle variation of the snowballing techniques was information, website addresses or literature that was received from other sources that were aware of the topics of interest to the study. This included communications from supervisors, other researchers with Cardiff University school of Social Sciences, including post-graduate

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researchers. The peer reviews of publications that emanated from the thesis and reviews conducted for journal articles also identified additional relevant literature.

An important aspect of the search strategy was the mechanism used to keep abreast of literature published over the lifespan of the thesis. This involved the use of automated e-mail alerts. The ZETOC database provides access to the British library's table of contents for journals and conference proceedings (ZETOC, 2010) and subscribers receive automated alerts of recently published material that matches previously defined keywords. The keywords used included:

- feeding practices, eating behaviour, food and choice, school and meal, food and preference
- Birch LL, Wardle J (author keywords)
- Appetite (journal keywords)

POSTnotes are short briefing notes on science and technology issues relevant to public policy (United Kingdom Parliament, 2010) that are sent by e-mail interested parties. These were received over the course of the study (although none were relevant).

Appendix C Pilot Study

The aims of the pilot study were to inform planning for the main study by testing the research protocol and materials in a real world setting, and to rehearse the data collection in situ. To support these aims, the objectives of the pilot study were to:

1. Inform planning for the main study
2. Test and refine the access and consent protocol within the constraints of the ethical approval obtained from Cardiff University's School of Social Sciences ethics committee
3. Test and refine the research protocol
4. Test and revise the research materials
5. Assess the effort expended per school by the researcher, participants and school support staff
6. Confirm the availability and accessibility of data required to answer the research questions

C1 Method

C1.1 Preliminary research materials

The literature review, research questions and methodological considerations formed the major inputs into the design of the research materials. In practical terms, this was achieved by a design matrix whose structure was based upon Spradley's definition of the nine dimensions of a social situation (1980), and whose content was driven by the literature review and the high level methodological design. The matrix was essentially a list of low-level questions matched against participant type/collection method. An extract is included in Figure 18. This top-down approach to the content of the data collection schedules ensured consistency between them and also adequate coverage with respect to addressing the main research questions. Schedules were designed for interviewing those participants in management positions who were to be interviewed with respect to the context in which dining halls operated i.e.. the director of education, LEA caterer and school headteachers. An observation schedule was designed to guide the observation sessions, supplemented by a schedule of questions for the post-observation sessions, and an interview schedule was designed for the child focus groups. In addition, information leaflets were prepared for both adult and

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child participants together with consent forms and parental opt-out forms. Protocols were drawn up to define the high level approach to: a) gaining access to the schools and other participants; b) the execution of the school consent procedures; and c) conducting interviews, observation sessions, post-observation interviews and focus groups.

Figure 18 Data collection schedule design matrix

ACTIVITIES	O ^a	PO ^b	FG ^c	SM ^d	Sch ^e	C ^f
Identify strategies, singly and in interaction with each other	✓	✓	-	-	-	-
Identify strategies from the child's perspective	-	-	✓	-	-	-
Do supervisors vary their strategies by child age?	✓	✓	-	-	-	-
What are the model:subject ratios if modelling is used?	✓	-	-	-	✓	-
What is the supervisor : child ratio – are all children equally exposed to all strategies, if not, are supervisors suitable agents?	✓	-	-	✓	-	✓
What temporary initiatives are used vs the status quo situation?	✓	✓	-	✓	✓	✓
How do the supervisor's attempts to control eating behaviour interact/interfere with their attempts to control other behaviour? eg do they use the food in a reward situation like parents do?	✓	✓	-	-	-	-

NOTES:

✓ = related question(s) included in schedule; - = question not applicable

^a Observation Schedule

^b Post Observation Interview

^c Focus Groups

^d LEA School Management Interview

^e School Interview

^f Caterer Interview

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C1.2 Sample

A key consideration for the pilot study was to gather data with the potential to provide practical guidance for the design of the main study before the end of the 2006/7 school year. For this reason, size of school was considered to be the major criterion upon which to base the sample. Therefore, a single large school was selected to ensure completion in the time frame whilst presenting sufficient operational challenges. Potential schools were selected from the 'Numbers on Roll September 2006' as published on the website of the LEA in which the researcher resided. It was accepted as a risk that this may not be the LEA used in the main study thereby rendering the data gathered unsuitable for inclusion in the main study.

C1.3 Pilot Study Planning

The pilot study was planned by taking each pilot study objective, determining what the required outcome(s) should be and how they were to be achieved in practical terms. This led to a number of detailed actions were which listed in a plan and assigned a unique number. The number was used to ensure that each objective led to actions in the plan and, conversely, that each action supported at least one objective e.g. actions 1-4 from the extract in Figure 19 were required to partially satisfy objective 2.

Figure 19 Extract from Pilot Study Action Plan

	Action - Ensure effort expended table is updated as plan is executed	Complete
1	Determine the Primary Schools within the selected LEA.	✓
2	Obtain school sizes and Free School Meal entitlement. <i>Obtained from the National Pupil Database (Local Government Data Unit Wales, 2006). This can also be used as a source for the School List if necessary.</i>	✓
3	Select Pilot School. <i>As per 'Sample paragraph' above.</i>	✓
4	Establish contact with school until one is found where the head agrees to participate. <i>Task ends when meeting is arranged with Headteacher.</i>	✓

The 'effort expended table' referred to in Figure 19 was critical to pilot study objective 1, i.e. planning the main study. The extract shown in Figure 20 relates to the actions in Figure 19. The actual amount of time spent on each task was recorded in

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this table, whilst a diary, together with the 'start' and 'end' dates in the table recorded the elapsed time for each task. The intention was to record how much time was spent on each task and over what period.

Figure 20 Extract from Effort Expended Table

TASK	START	TIMES	END
Derive School List	11/05/07	2 hours – Size and FSM has to be extracted school by school	11/05/07
Approaches to schools unwilling to participate	20/06/07	0 - First school contacted agreed to participate (not expected to be typical!)	20/06/07
Establishing contact with head	20/06/07	0 - First phone call was answered directly by head.	20/06/07
Initial meeting with head	20/06/07	½ hr – head preferred to talk through details over phone. Secretary provided additional details of numbers of docs to print (250 + 15 supervisors)	20/06/07

The pilot study was carried out in two phases. The first focussed on the access and consent procedures, the dining hall observation and post-observation interviews together with the school management interview. The second focussed on the child focus groups.

C1.4 Dining Hall Observation Procedure

The dining hall observation took place over two consecutive days. Prior to the first session, a plan of the area was drawn. Prior to the second session, photographs were taken of key locations in the dining hall. Throughout the lunch time, notes were taken on the observation schedule, guided, but not constrained, by the prompts within the schedule of key things to look for. The fieldnotes were annotated with points to be clarified during the post observation session. All adults in the dining hall had consented to take part and 5 children had opted-out of the procedure. The senior supervisor was asked to point these children out.

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The post observation session took place two days later with the interview questions drawn from the preliminary interview schedule and the observation fieldnotes. Only the senior cook agreed to take part in this session. The head teacher interview also took place two days later, once again guided by the preliminary interview schedule and the observation fieldnotes. Reflexive notes were made at each stage of the process.

C1.5 Child Focus Group Procedure

Possible strategies for conducting the child focus groups were discussed during the interview with the head teacher of the pilot school whose recommendation was to use pre-existing school pupil groups such as the school council or eco-committee. These groups typically consist of one boy and one girl from each year in the school, barring the reception class. The children are elected by their peers and comfortable airing their views in a group with adults present. Although the potential group size was larger than the 5-6 pupils considered to be manageable for one researcher to facilitate, the suggestion had merits in that school staff would be present to assist, and the session would be natural occurrence allowing the study to be minimally intrusive on school time.

The school council in the pilot school was elected early in the first term of the 2007/8 academic year. The first planned agenda item was one that had been raised by the council during the previous school year, namely, to discuss children's concerns that the younger children were not eating their school dinners. During the first council meeting, the children were given a copy of the Child information sheet for the study and number of questions to canvass their friends about and report back at the next meeting. This was the standard way of working in the pilot school as it gave the children time to think about issues and also allowed the views of the whole school to be represented. The questions were:

Q1: "Why are you worried that some children do not eat their school dinners?"

Q2: "Why don't the children want to eat their school dinner?"

Q3: "Do you have any ideas about to encourage children to eat their dinners?"

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The children sat in a circle on the floor in a quiet area of the classroom of the teacher who ran the council. At the start of the session, to build rapport and relax the children, they were asked if they knew what the voice recorder was. Suggestions included an iPod or a new electrical gadget. The recorder (with an omni-directional microphone) was then turned on and the children were asked to say their names and ages. Part of this recording was played back to the children which served the purpose of confirming the recording quality. The children were asked Q1 above as a starter and the discussion grew from there. Hands up were used with a round robin approach to ensure all had a chance to speak. As council members, two children had note books and two had notes from friends which contained other children's views on the three primer questions. Probe questions were used to expand the responses, sometimes taking counts of hands up if a quantitative question was used, e.g., 'How many of you have cooked dinners?'. Only a couple of children did not speak. The session lasted 25 minutes and could have gone on but the children needed to have their own lunches.

C1.6 Method of Analysis

A preliminary analysis of the data was undertaken using ATLAS.ti v5.2. This was a pragmatic decision due to an ATLAS course having recently been undertaken.

C2 Preliminary findings

The findings of the pilot study are presented with respect to its stated objectives.

C2.1 Access and consent protocol

The first school approached agreed to participate with verbal consent given directly over the phone without the need for a face-to-face meeting as had been planned. As a result, the consent and access protocol was revised to allow the initial contact interview to be done over the phone rather than assuming a meeting was required. This reduced amount of preparation required prior to the initial call.

During the course of seeking opt-out consent, seven parents had mis-understood the consent form and returned it to include their child in the study and six children were opted out. As a result, the parental opt-out form was clarified to attempt to reduce the numbers who wrongly filled it in to give consent. In addition, the participant information form was revised to make it clear that children were only going to be

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unobtrusively observed from a distance and would not be directly approached or spoken to. This was to try and reduce the number of opt-outs received.

The pilot school was bilingual in that there were Welsh and English streams. One parent raised an objection that the focus groups were not being conducted in Welsh. Although the headteacher confirmed that it was not the practice for school-wide groups/committees to converse in Welsh, the objection merited reconsidering the original intention to exclude Welsh medium schools from the study.

All the staff involved in the dining hall agreed to participate in the observation. However, none of the supervisory staff agreed to be interviewed in the post-observation session since the senior supervisor felt that their jobs involved doing what they needed to and were not worthy of discussion. This was considered to be an important finding in its own right.

C2.2 Research protocol

The observation protocol was amended to include the taking of photographs of the empty hall and also of the published menu. The opt-out strategy proved to be unworkable since the staggered and rapid throughput of children coupled with the supervisors' intense workload were not conducive to them being able to identify the opted out children. As soon as this became apparent, the observation was conducted more from the perimeter of the dining hall rather than the centre to observe the generality of what was occurring rather than the detail of specific events.

The serving area of the dining hall was very small which limited the number of cooks who could serve the children and also meant that salads and sweets were served in the hall rather than from the serving hatch. As a result, this area was difficult to observe but it also proved to be a focal point for most of the staff:child interactions. These practical issues, together with the difficulties in identifying opted-out children highlighted the importance of the post observation sessions and also of interviewing the head teacher last in order to clear up any outstanding questions. However, the richness of the data obtained by being able to experience the totality of the scene and to seek out events of interest outweighed the issues that had been encountered whilst observing.

The supervisors had declined to be interviewed on the basis that the senior supervisor declined and they did not wish to be seen to go against her wishes. This was assumed to be an idiosyncrasy related to the school and therefore, the protocol was not amended as a result. However, the main study showed that difficulty interviewing the supervisors was typical rather than idiosyncratic, requiring the method to be adjusted later on (see section 5.2.2).

The post-observation protocol was revised to emphasise the importance of interviewing cooks as well as supervisors and also that interviews may need to be held singly as well as in groups depending on the preferences of the participants. The interview protocol was amended to suggest that headteachers are interviewed after the observations rather than before. The focus group procedure was not amended from that used in the pilot.

C2.3 Research materials

The structure of the post-observation interview schedule was extensively revised to relate more to the scenarios that had been found (e.g., serving the child, devising a menu) than to the concepts (e.g., strategies, resistances and outcomes) that had been envisaged based upon the literature.

C2.4 Effort expended per school

The effort expended on the pilot study was 50.25 hours. This figure together with the detail entered in the effort expended form was used to draw up the project plan for the main study.

C2.5 Accessibility of data required to answer the research questions

The initial data analysis suggested that the methodological approach was capable of collecting data that would address the research questions. It also confirmed that the interactions inherent in the dining hall did reflect those predicted by the literature reviewed.

The most noteworthy results suggested that infants receive the most supervision from the supervisory staff as opposed to the juniors who received very little. However, the serving staff had the opportunity to interact with each child, albeit for a maximum of

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fifteen seconds each. Cooks had room to interpret the menus set by the LEA due to the presence of non-specific menu items such as 'seasonal potatoes'. A long-standing strategy was used requiring infants to raise their hands to seek permission to begin eating their sweet once they had had enough of the main course, and later to go out to play. This ensured that the infants ate a balanced meal in accordance with a culturally acceptable meal structure and in sufficient quantity to sustain them and ensure their parents received value for money.

Appendix D Recruitment protocol and materials

All the research materials were presented to the participants in Welsh and English – only the English versions are included here.

The researchers contact details have been intentionally omitted from these Appendices.

D1 School recruitment protocol

Be prepared to go through this over the phone when initial contact made

MATERIALS REQD

- Participant Information Sheets (PI)
- Consent Form (*for in loco parentis*)
- Child Information Form and Opt Out Consent form
- Notepad, pen
- School management interview schedule and associated Information and Consent forms (in case head wishes to do this at the same time as the access interview)

Provide Background Information

- Hand over PI and expand upon verbally as appropriate

in loco parentis consent

- Determine Persons/bodies deemed sufficient
- Obtain Head teacher's consent if possible
- Obtain contact details for other persons/bodies required for consent

Parental Information and Opt Out Consent

- Describe 'Information Pack' which is the PI, Child Sheet and Opt Out Form
- Determine mechanism and timing for getting information out to parents
 - Web pages / newsletter
 - Pupilpost
 - Teacher briefing required?
 - Best way of getting forms back to researcher

School Meal Staff Consent

- Contact mechanism for school meal staff
 - Best way of getting consent forms back to researcher

Other information

- Preference for timing of observation sessions
- Any temporary initiatives coming up (AVOID THESE)
- Identity and contact details of person(s) to conduct the school interview with
- If focus groups were to be undertaken, is there an opportunity with the timing to link to the curriculum for any age group
- Find out how to determine School Meal take up or other useful stats
- Agree a single point of contact for future contacts
- **AGREE NEXT STEPS WITH DATES**

D2 LEA consent form

**Improving the Eating Behaviours of Primary Schoolchildren
Research into school meal supervisors' strategies**



LEA Consent Form

**Please
initial**

1. I confirm that I have read and understood the participant information sheet (version 2.0 dated 17/07/07) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
2. I agree that School Catering staff and staff involved in the management of the school meals service may be approached to take part in the study.
3. I agree that schools within Cardiff may be approached to take part in the study. I understand that each school's participation is voluntary and that further consent will be sought from each head teacher to approach their staff and the parents/guardians of the children in the school.
4. I understand that the participation of each individual, whether employed by the school or the LEA, is voluntary and that they are free to withdraw at any time, without giving a reason.
5. I understand that consent for the children in the school to participate will be sought *in loco-parentis* from their head teacher and that each parent will further be given the opportunity to exclude their child from the study.
6. I understand that, even if a headteacher was willing for a school to participate, the school will be excluded should voluntary participation by its catering staff, supervisors or parents/guardians not be forthcoming.

_____ on behalf of Cardiff Local Education Authority
Name of participant

Date

Signature

Sue Moore _____
Name of person taking consent Date Signature

D3 School cover sheet

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INFORMATION AND CONSENT DISTRIBUTION DETAILS

The box contains:

1. Study information and consent form for the headteacher for signature. This indicates that the school is willing to participate and acts as in loco-parentis consent for the children to take part.
2. stapled information booklets (*at the bottom of the box*) for distribution to parents of infants and juniors. The booklet contains a form for parents to return to school if they do not wish their child to take part in the study. This supplements the consent obtained from the headteacher.
3. information and consent leaflets for any adult that will be in the dining hall at the time of the observation. For example:
 - the midday supervisors
 - the kitchen staff
 - any teaching staff or assistants
 - volunteer supervisors
 - school caretaker

Possible date for observations:

The school is requested to:

1. Distribute parent forms via children and collect any returned opt out forms
2. Sign headteacher form
3. Distribute adult forms and collect signed consent forms.

I will contact the school on or around to assess consent levels and hopefully discuss possible dates to carry out the study.

Please don't hesitate to contact me at any time on *omitted* or by e-mail at *omitted* if you have any questions.

D4 Participant information sheet (adults)

Improving the Eating Behaviours of Primary Schoolchildren Research into strategies used by school meal staff



THIS INFORMATION LEAFLET IS FOR PARTICIPANTS OR PARENTS/GUARDIANS
You (or your child if you have received this leaflet via a school) are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Talk to others about the study if you wish. A separate information sheet is available for children to read.

What is the purpose of the study?

In schools, it has been suggested that school meal staff may play a vital role in encouraging children to eat. This study aims to identify the techniques school meal staff use. Its findings may inform future guidance.

What is involved?

- ❖ Observation sessions will take place during normal lunch times in the school dining hall. The focus will be on how school meal staff encourage children to eat. These will be supplemented by interviews with some of the staff observed.
- ❖ Interviews will be conducted to gain an understanding of the context surrounding school meal supervision e.g. there may be policies, guidelines or objectives that affect lunch time supervision.
- ❖ Focus Groups will be conducted with some children to understand their views on lunchtime practices.

How will information be recorded?

- ❖ During the observation sessions, brief notes will be taken which will be written up into 'fieldnotes' shortly after each session.
- ❖ With the permission of the participants, interviews will be tape-recorded from which written transcripts will be created.

What will happen with the information?

The fieldnotes and transcripts will only be accessible to myself and my supervisors and will be kept securely, in strict accordance with the Data Protection Act. They will not be used for any other purpose. An analysis of the information will form the basis of my PhD thesis and may be published in academic journals. You are welcome to see a copy of the thesis/journal articles prior to publication.

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Is this part of a school inspection?

No.

Will the children being observed in the dining hall be directly approached?

No. The children will be observed as unobtrusively as possible and will not be asked any questions.

Will taking part be confidential?

Yes. The participants and schools will not be named or identified in any way in the fieldnotes, transcripts or the reports of the study.

What if parents/guardians do not wish their child to participate?

If you have received this leaflet via school and you do not wish your child to take part, please complete the attached form and return it to the school. If you do not return the form, your child will automatically be included in the study.

Do the children have to take part in focus groups as well as being observed?

No. Only a small number of focus groups will take place. If you are willing for your child to participate in the observation session but not a focus group, this is fine. Please indicate this on the attached form.

What if school meal staff don't wish to be observed?

The sessions will only be scheduled for days when all staff working on that day are willing to take part. If this is not possible, the school may have to be excluded from the study.

Do school meal staff have to be interviewed as well as being observed?

No. If school meal staff are willing to participate in the observation session but do not wish to be interviewed, this is fine. Please indicate this on the attached consent form.

What if participants change their minds about taking part?

Participation is voluntary and anyone can withdraw at any time, without giving a reason. However, I would reserve the right to include any non-personal data that was given prior to leaving.

Who am I ?

My name is Sue Moore and I am doctoral researcher at Cardiff University, funded by the Economic and Social Research Council. The research is being undertaken in collaboration with two Senior Researchers at the University and has the approval of Cardiff University School of Social Sciences Ethics Committee. I have clearance from the Criminal Records Bureau to work with children. If you would like further information about the study, you can contact me at any time on *omitted* or by e-mail at *omitted*

D5 Participant information sheet (children)

What happens at School Lunchtimes?



Hi!

My name is Sue. Just like you go to school everyday, I go to a place called Cardiff University. Universities are where people go to learn after they leave school. This is called being a student. Some of you might have older brothers or sisters who are students.

As part of finding out about things, does your teacher ask you to do projects sometimes? University students have to do that too. My project is to find out what happens at school lunchtimes and I think you might be able to help me.



A good way of finding out is to watch what happens in real life. Your Headteacher has said it's OK for me to come to your school and watch what school lunchtimes are like. I'll write things down to help me remember so that when I go home, I'll be able to describe what I saw for my project.

Your teacher might also arrange for you and some of your friends to get together in a group so I can ask you about school lunchtimes. That way, I can write about your views as well.



D6 Parental opt-out sheet

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Participation Opt Out Form

You need only complete this form and return it to your child's school if you DO NOT wish your child to participate in all or part of the study

PLEASE NOTE: IF YOU DO NOT RETURN THE FORM, YOUR CHILD WILL AUTOMATICALLY BE INCLUDED IN THE STUDY.

Please
initial

I confirm that I have read and understood the participant information sheet (version 2.0 dated 17/07/07) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

I understand that participation is voluntary and that I would be free to withdraw my child at any time, without giving a reason

If you ARE NOT willing for your child to be observed as part of this study, please initial here

If you ARE NOT willing for your child to take part in any focus groups as a part of this study please initial here

Name of child

Name of parent/guardian

Date

Signature

D8 Post participation note

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I would like to express my gratitude to all of those children and staff took part in the recent dining hall study and also those who helped with the distribution of the information forms.

All research relies on voluntary participation and this particular study impacts upon the school administration, lunch preparation and the lunch time itself, all of which are busy enough at normal times. It was a privilege to be allowed to intrude upon the children's private eating time and to observe first hand what lunch time supervision involves. A great deal of hard work and experience goes into making lunchtimes successful and I hope that this study leads to a greater understanding of what is involved.

On a personal level, the willingness of others to take part in this research is critical to the success of my PhD. Recruiting willing volunteers is always very stressful as they can be hard to find. I can't thank everyone enough for making me welcome and for making the experience a pleasurable one.

Over the next few months, the data from all the schools involved will be merged and analysed to see what patterns emerge. The aim is to use these to inform future guidance for those whose roles involve encouraging children to eat in school.

Thank-you again.

Sue.

D9 Interview protocol

MATERIALS REQD:

- Participant Information form
- Consent Form
- Interview Schedule and pens
- Research protocol - interviews
- Recorder, spare batteries
- Notepad

One-to-one interviews will be conducted with those who are able to define the context in which the school meals take place. Although a single Information sheet and consent form are used, the schedule will vary depending upon the participant/subject. i.e.

- Director of Education – LEA context
- LEA caterer – Catering context
- School Management – School context

Protocol

- Ensure participant has received and understood the Information form
- Obtain consent
- Ensure participant is willing to be recorded
- Follow Interview Schedule

D10 Contextual interview schedule

INTRODUCTORY QUESTION:

- ⇒ Could you give me a brief overview of your objectives in Wales with respect to primary school meals?
- ⇒ Do you issue guidelines for caterers → Get them

OBJECTIVES

- ⇒ What do you see as the objective of the primary school catering service?
 - As regards the children

PHYSICAL ENVIRONMENT

- ⇒ Could you describe what you would consider to be the key required features of the school dining hall environment from the catering perspective?
 - Queueing mechanism
 - seating
 - Menu display –bilingual
 - GUIDELINES → (obtain if possible)
- ⇒ Are there schools that have difficulties serving meals eg kitchens
 - Do any have bespoke dining areas?
 - How are these addressed?
- ⇒ What is the recommended length of lunchtime?
 - Set by whom?
 - Limitations eg 15 secs per child
- ⇒ Who devises the system used as regards sittings etc?
- ⇒ What expectation do you have regarding to support received from supervisors?

CATERING STAFF

LEA MANAGERS ONLY:

- *Approval for school meal staff under their control to be involved*
- ⇒ Is there a JD for catering staff → (obtain if possible)
 - Apart from cooking or nutritional skills, what attributes do you look for?
 - How easy is it to recruit?
- ⇒ How do you work out how many staff you need per school?
- ⇒ At the point of service , the cooks have 1-1 interactions with the children:
 - what are the objectives of the server?
 - Should they play a role in influencing the child's choice?

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- Eg, what if a child only wanted pudding?
 - Could they / would they be willing?
 - Do they have any training in how to do this? WHAT IS IT
- ⇒ What difficulties are experienced with the children's eating?
 - Are there particular periods when difficulties are experienced eg new intake, new menu, times of year?
 - What are they
 - what advice are staff given on what to do with a child who is upset /greedy ?
- ⇒ Considering the service as a whole, what are the main barriers it faces?

MENU

- What are the objectives of the PRIMARY school menu?
 - To what extent are brand new foods included in menus that try to broaden the overall range of what the child eats?
- How does food need to be promoted to a child to convince them to choose sensibly and actually eat it? (health, teeth, fit etc)
- What are the least popular menu items?
 - How do you address this?
- Most popular?
- What discretion do the cooks have over the menu items eg SEASONAL, GARDEN VEG, SELECTION OF? Salads?
 - Does this cause any issues?
-

WHOLE SCHOOL?

- Do you have any temporary initiatives aimed at eating behaviours?
 - Tasting sessions?
- How do you assess whether these are successful? Eg takeup, change in behaviours (more roasts)
- What is the role of the catering service in whole school initiatives?
 - Eg WNHSS scheme, eco-school schemes
 - Do staff participate in the government of the school?

D11 School manager interview schedule

SCHOOL MEAL STAFF Cooks/Supervisors/Others

- Formal roles & responsibilities, key skills of those employed by school
 - Supplied by LEA
- Attributes
- Involvement in policy setting?
- How do you determine the ratio of cooks/supervisors to children?

CONTEXT

- Is the school part of the
 - Welsh Network of Healthy Schools Scheme?
 - WAG Free breakfast?
 - Eco-schools?
 - Anr
- Have there been any noticeable changes in eating behaviour as a result of any of these initiatives?
 - Ditto historically?
- What role do you see the dining hall playing in a whole school approach to healthy eating?
- Does the school sometimes participate in temporary food related initiatives instigated by the LEA?
 - The school?
- School bodies which influence dining hall practices eg School Nutrition Action Group
- Is there any liaison with the caterer ? by whom? Why?
- Policies and guidelines (Access to source?) eg School Food Policy
 - What do you perceive the parent/governor body's attitudes to healthy eating and school meals are?
- Perceived barriers to consumption of healthy lunches (dislike, poor choice, neophobia)
 - Age related?
- What do you think would improve eating behaviours?

CURRICULUM

- To what extent is the dining hall used to reinforce what may be taught in the classroom

SCHOOL SPECIFIC QUESTIONS BASED ON OBSERVATION

D12 Post observation interview protocol

PRE-REQUISITE:

- Observation sessions complete

MATERIALS REQD:

- Post Observation Interview Schedule and pens
- Completed Observation Schedules for school concerned
- Research protocol
- Recorder, spare batteries
- Notepad

This should involve those supervisors/cooks who were part of the observation and who have consented to take part. Ideally it should take place immediately after the final observation. If any participants wish to be interviewed separately, this is acceptable. The group approach is intended to minimise time whilst maximising participation. It is anticipated this will vary by school.

Start the interview, relax them and get their voices identified by asking each of them the fixed introductory question. Explain that even though you asked for names, these will be changed in the transcript and are only to help identify their voices.

The semi-structured interview schedule has been designed to fulfil 3 primary objectives:

1. To clarify and expand on specific acts observed. This may be particularly important if the observation is done distantly due to issues with identifying opted out children
2. To gather more information that is not observable or did not occur during the observation
3. To probe further on the main strategies in the framework that were not spontaneously mentioned

D13 Post observation interview schedule

'Q' points from observation schedule

'I' points – WHY did you do that?, Was it EFFECTIVE?

Structure of role (Cooks/ Supervisors/Others):

Job description

Non-cooking skills training.

Involvement in curriculum or outside initiatives. – direct or via problems

Involvement in policy setting – Actual / desired

Do you think your role could/should be extended to encourage the children to eat more healthily?

How long have you been doing the job?

AVAILABILITY AND ACCESSIBILITY:

(Cooks only):

How do you interpret items such as 'seasonal potatoes', 'garden veg'?

How you determine how to display the food choices?

How do you work out how many servings per menu option?

STRATEGIES:

Can you talk me through any examples of:

- Interactions at the point of service?
- How you encourage/discourage eating that didn't crop up?
- where you vary your approach based upon some characteristic of the child (age, gender, personality)?

RESISTANCES:

What menu items are unpopular with the children?

How do you address this?

What problems do you encounter with respect to what the children eat?

What particular food related problems are encountered with a new intake?

How do you overcome them? Successfully?

OUTCOMES:

Other than discipline issues, what are your goals with respect to the children's eating (healthy choice, no waste, diverse diets etc)?

MOP UP:

See **grid** on types of strategy observed and try to ascertain if any others have been used:

- Can you talk me through a situation when you've tried to encourage the children to eat by using (rewards, role modelling, repeated exposure, pressure, restriction)?
- If not, is there a reason why such an approach is not used?

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TELEPHONE INTERVIEW

I'm interested in that part of your role which deals with the children eating dinners as opposed to playground duties or sandwich duties.

What does that part of your role involve?

Job description

Training.

Can you talk me through any examples of occasions when you've had to encourage a child to eat?

Do you think this is an important part of your role?

How long have you been doing the job?

What attracts you to the job?

If you were to receive training, would you rather receive it in written form or as more formalised training?

What problems does attending training courses outside your normal working day present you?

What is the most common objection that a child raises to eating their food?

D14 Observation protocol

PRE-REQUISITES:

- Consent from school meal staff
- Child Opt-out procedures followed

MATERIALS REQD:

- Observation Schedule and pens – a fresh schedule should be taken on each day to allow assessment of whether the days are different.
- Camera to photograph EMPTY hall (i.e. no people)
- Clipboard
- Research protocol - observation
- Recorder, spare batteries
- Notepad

To be done before the main observation session:

- ENSURE CONSENT HAS BEEN OBTAINED FROM ADULTS PRESENT
- Assign school identifier and fixed school information
- Record the dining hall context and assign mnemonics to key areas
- For days 2+, strike out fixed type data that does not need to be collected again
- Obtain the menu for the day (meals and grab bags)
- ENSURE NON PARTICIPATING CHILDREN ARE IDENTIFIED (make identification notes on observation schedule, p1)
- If possible, photograph the layout of the dining hall

During the Observation:

Be guided by the observation schedule REMEMBERING:

- Noting timings where possible on the notesheets
- Locations to attend to where strategies may be employed: Service point, tables, waste disposal.
- For interactions attended to, note: (*description, trigger, who, where, time, duration, nos involved, age/gender involved, persistence, desired/actual outcome*)
- Go back to any area where an interaction was noted to observe what happens when the supervisor leaves (*i.e. delayed outcomes*)
- Note the staff movements on the floor plan
- Mark points for follow up in the Post-observation Interviews with a Q (if they are unclear) or I (to get a verbalised description)

To be done after each observation session :

- Determine numbers eating lunch (inc FSM)
- Determine waste (food not served / not eaten)

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D15 Observation schedule

Date of Observation: Day of Observation :

School Code:..... Size: FSM:

How are opted out children identified?.....

KEY

Areas: S=Servery; K=Kitchen; T=Tables; W = Waste

People: Cn=Cook; Sn=Supervisor; CH=children; A=Other adults

Activities: Q = Queuing; F=Food collection; EM=Eating Meals; EP= Eating

Packed Lunches: C=Clear up

Dining Hall Floor Plan (*Physical Layout ,location of activities and people, time based if possible*)

No of tables:..... No per table..... → No Children.....

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Structure of Lunch Time

Start:..... End:..... LEA caterer?.....

Ages segregated?..... Models evident?.....

How are tables allocated?.....

Sittings? Genders segregated?

Bespoke area?..... Kitchen onsite?.....

No of Cooks:.....No of Supervisors:..... → Child:Sup =

Temporary initiatives/activities? Eg curriculum based, HS.....

.....
.....

Additional comments re behavioural and social norms: *(Duties of staff, rules for children, any 'covert' activities that influence eating eg slow eaters with fast ones, justifications for eating)*

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Food (*Restriction by proxy?*)

Menu: (*incl course choice rules, new food, Grab bags, layout of food*)

Taste modelling ? (*note food type*).....

Verbalisations(*note food type*).....

Children's Choices: (*Courses, comments- with age/gender if poss*)

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Interactions at Service point: *(describe, trigger, who, where, time, duration, nos involved, age, gender, persistence, desired outcome, actual outcome. Consider adult:child, adult:adult: child:child)*

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Non-eating Behaviours

Food used to reward?.....

Greater priority given to?.....

General behaviour level of children.....

Types responded to: (*detail not reqd, just type and proportion of supervisory effort*)

Attributes of adults: (*age, gender, motivation, demeanour, roles*)

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HAVE YOU SEEN AN EXAMPLE OF:

Strategy:

Reward	Modelling	R(T)E	Pressure	Restriction
- praise	- tasting	- new food	- clean plate	- portion size
- play	- verbal only	- familiar food	- eat after full	- eating order
- housepoints	- verbal + anr	- tasting encouraged	- hurry	- indirect choice control
- other tangible	- choice	- alone	- by food group	
Act → food	- by peer		- threat	
Food → food	- by teacher		- punishment	
Food → anr	- by supervisor		- 'all of'	
	- by other		- 'some of'	
	- by fictitious			
	- reward anr child			

Desired Outcome:

Consumption	Liking	Choice	Other
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Actual Outcome:

Consumption	Liking	Choice	Other
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Resistance:

Neophobia	Dislikes	Poor choice	Other
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If day 2, are the same people targeted with the same strategy?
 (for ease, reinforcement?) **IF Y, FOLLOW UP AT INTERVIEW**

Interactions at Tables: *(describe, trigger, who, where, time, duration, nos involved, age, gender, persistence, outcome. Consider adult:child, adult:adult: child:child)*
REVISIT LATER IN SESSION TO DESCRIBE DELAYED OUTCOMES

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Interactions in unsupervised areas

Proportion/areas unsupervised at any time.....

Child models?..... Child supervisors?.....

Child:child interactions: (*age, gender, describe*) Note detail if food related, otherwise, briefly. BE CAREFUL THAT ALL CHILDREN HAVE CONSENTED.

D16 Fieldnote template

Perception of school ethos:

Q Fixed Data

Size:

FSM entitlement:

Lunches: (1) (2)

Packed: : (1) (2)

Grab bags: : (1) (2)

Surroundings:

Bespoke area?

Kitchen onsite

Room layout:

No of tables: No per table:

Q Structure of Lunch Time

Start: End: Duration:

Ages segregated:

Models evident:

Input:

How are tables allocated

Sittings

Genders segregated

No of Cooks

No of Supervisors: → Child:Sup =

Q Temporary initiatives/activities? Eg curriculum based, HS

Q Behavioural and Social Norms:

Q Food

Q Taste modelling

Q Verbalisations

Q Children's Choices

Q Interactions at Service point:

Q Interactions at Waste point:

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Q Interactions at Tables

Q Non-eating Behaviours

Food used to reward

Greater priority given to

General behaviour level of children

Types responded to

Q Attributes of adults:

Q Strategy seen:

Reward

-praise

-play

-housepoints

-other tangible

act → food

food → food

food → anr

Modelling

-tasting

-verbal

-verbal + anr

-choice

- by peer

- by teacher

- by supervisor

- by other

- by fictitious

-reward anr child

R(T)E

-new food

-familiar food

-tasting encouraged

-alone

Pressure

- clean plate

- eat after full

- hurry

- by food group

- threat

- punishment

- 'all of'

- 'some of'

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Restriction

- portion size
- eating order
- indirect choice

Q Desired Outcome:

- Consumption
- Liking
- Choice
- Other

Q Actual Outcome:

- Consumption
- Liking
- Choice
- Other

Q Resistances

- Neophobia
- Dislikes
- Poor choice
- Other

Q Interactions in unsupervised areas

- Proportion/areas unsupervised at any time
- Child models
- Child supervisors

Q Child:child interactions

Appendix E Rewards in the food domain

There are several socio-psychological theories on how rewards influence behaviour. Those presented below are the dominant theories within the literature relating to the food-reward domain.

The influence of rewards on behaviour depends on the nature of the reward and is related to its effect on an individual's intrinsic motivation to carry out the behaviour. Intrinsically motivated behaviour is that which is undertaken for no other apparent reward than the behaviour itself delivers e.g. enjoyment or satisfaction (Deci, 1971). Through experiments carried out on college students on non food related tasks, Deci (1971) was able to show that tangible rewards (money) decrease intrinsic motivation to perform an activity, whereas intangible rewards (social approval) increase, or at least maintain, intrinsic motivation.

A number of theoretical explanations for these effects have been suggested. Deci (1971) suggested that, since humans have cognitive control over both their behaviour and their motivation, rewards assist the individual's phenomenological interpretation of an activity. Tangible rewards are perceived as detracting from the individual's sense of control and serve to weaken their intrinsic motivation. However, intangible rewards are not perceived as 'rewards', thus the individual preserves their locus of control and the social approval enhances the general sense of satisfaction delivered by the activity. Lepper & Green (1978) initially accounted for the differential effects of tangible and intangible rewards by proposing an 'overjustification effect' whereby a decrease in intrinsic motivation to perform an activity would be likely to occur if an individual were offered a reward to carry out that activity, i.e. if the activity was perceived as a 'means' to an 'end'. However, on observing decreases in intrinsic motivation for intangible rewards, Lepper and colleagues redefined the trigger for the overjustification effect as the imposition of 'functionally superfluous' constraints on an activity (Lepper, Sagotsky, Defoe, & Greene, 1982).

Another explanation is the 'response deprivation effect' whereby the individual perceives themselves as being deprived of their desired level of the reward and/or

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being forced to increase their preferred level of an activity in order to regain access to their desired level of the reward, thus generating a negative effect towards this activity (Timberlake & Allison, 1974). However, all these explanations require a sophisticated level of cognitive processing which may be beyond the primary schoolchild's developmental capability.

The cognitive ability of the child also influences how they behave in reward situations. The 'discounting principle' begins to emerge at about age 7-9 years and is important in the understanding of how and why children react in reward scenarios (Sedlak & Kurtz, 1981). It means that by this age, children will have acquired a generalised ability to reason that if an external reward is offered as inducement for an activity, any intrinsic properties of that activity can be discounted i.e. the activity is likely to be inherently undesirable in its own right. This reduces the motivation to carry out the activity in the absence of the reward due to the (discounted) perception that the activity is likeable. Ironically, in the food domain, the same outcome has been observed in younger children suggesting that a more parsimonious explanation for rewards decreasing a child's intrinsic motivation to perform a task may be attributable to experiential learning of social scripts (Lepper, et al., 1982). Lepper et al. described the 'dinner table debate' (1982, p54) as the familiar social script experienced by children from an early age that they will not get access to one food (e.g. dessert) before another (e.g. a vegetable) is eaten. From this and other similar situations, the child learns from an early age that any activity which requires rewarding is likely to be less desirable than the reward itself. The resultant behaviour in this case is a result of social learning rather than being an acquired cognitive ability (Kassin & Lepper, 1984). Basic scriptal knowledge of simple food scenarios has been shown to influence how children interpret the desirability of both means and end activities in these scenarios until age 9 years (Newman, Beauchamp, Latimer, & Kao, 2003) – it has not been studied in 11 year olds. Newman et al. also demonstrated a potency effect such that, in the food scenario, by the time the child is age 9, they are able to recognise that the more desirable the reward is, the less desirable the instrumental activity will be.

A substantive proportion of the literature on feeding strategies that deals with the use of rewards attributes their effects to classical conditioning (e.g., Birch, et al., 1980). On

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the surface, this appears counter-intuitive since a reward is generally intended to function as a reinforcer of a desirable behaviour which is associated with operant conditioning rather than classical conditioning. However, the studies' objectives were to investigate how rewards influenced 'food preferences' operationalised as *affective* reactions to food and, as noted above, it is known 'beyond any reasonable doubt' (de Houwer, et al., 2001) that such preferences can be created by classical conditioning. On the other hand, the literature which has used the term 'operant conditioning' has typically investigated food intake, which is a behaviour rather than an affective reaction, (e.g., Bernal, 1972; Lowe, et al., 1998). Furthermore, using rewards to influence affective reactions to foods is typically less effective than using them to influence behaviours such as consumption.

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