The development and evaluation of a complex intervention to promote participant engagement with a public health programme

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

Public health programmes are aimed at promoting health and well-being, or preventing ill-health across communities and populations. The impact of public health programmes is often hindered by poor participant engagement. Yet, few interventions have been designed to address this, particularly those that demonstrate an effect. This thesis describes the development and evaluation of a participant engagement intervention aimed at promoting parent engagement with an obesity prevention programme (HENRY) delivered in UK children's centres.

Three studies were undertaken. The first, a focused ethnography study, explored the factors influencing parent engagement with HENRY. The second involved the development of a participant engagement intervention using the Behaviour Change Wheel approach. This intervention was tested in a cluster randomised controlled trial in work outside of the PhD. The third study within the PhD was a theory based process evaluation to provide explanation of the trial result.

The results of the ethnography highlighted the role of implementation factors on parent engagement, including the 'implementation climate' which influenced how HENRY was perceived by parents. The importance of achieving local authority level buy-in was also revealed, along with its cascading effect on local implementation practices. The participant engagement intervention aimed to change behaviours across the children's centre hierarchy to promote engagement with HENRY. This included local authority commissioners, children's centre managers and staff. The trial of the intervention did not find a significant effect, but the process evaluation revealed challenges within the children's centre context, such as financial constraints and centre closures which hindered implementation, engagement and uptake of the intervention, reducing potential impact.

The findings of this thesis emphasise the importance of public health programmes receiving adequate engagement, infrastructural and organisational support. Without this, programme reach, sustainability and impact are threatened, risking waste of valuable public health resource.

Table of Contents

Acknowledgements 3
Abstract 4
Table of Contents 5
List of Tables 11
List of Figures 13
Chapter One: Introduction 14
1.1 Introduction to the thesis topic 14
1.1.1 Public health programmes 14
1.1.3 Barriers to participant engagement 15
1.1.4 Interventions to promote engagement 16
1.1.5 Obesity prevention programmes 16
1.1.6 Health Exercise and Nutrition in the Really Young (HENRY) 17
1.1.7 Delivery of HENRY programmes 18
1.1.8 Summary of research topic 18
1.2 Origin of the thesis 19
1.3 Aims and objectives 21
1.4 Structure of thesis 21
Chapter Two: Existing evidence of the effect of public health programme participant engagement interventions – a review **23**
2.1 Introduction 23
2.2 Aim and objectives 23
2.3 Methods 24
2.3.1 Search strategy 24
2.3.2 Eligibility Criteria 24
2.3.2.1 Inclusion criteria 25
2.3.2.2 Exclusion criteria 25
2.3.3 Data extraction and synthesis 25
2.4 Results 25
2.4.1 Engagement interventions 41
2.4.1.1 Monetary incentives 41
2.4.1.2 Programme format 43
2.4.1.3 Prize draw incentive 43
2.4.1.4 Manipulated recruitment strategies 44

2.4.1.5 Text message reminders 46
2.4.1.6 Testimonial 47
2.5 Discussion 48
2.5.1 Quality of the evidence 50
2.5.2 Completeness and applicability of the findings 51
2.5.3 Strengths and limitations of review 53
2.5.4 Implications for practice 54
2.6 Conclusion 54
Chapter Three: Focused Ethnography Study 56
3.1 Introduction 56
3.1.1 Overview of chapter 56
3.1.2 An introduction to ethnography 57
3.1.3 Theoretical approach 59
3.1.3.1 Parent engagement with parenting programmes ... 59
3.1.3.2 Implementation factors influencing engagement 60
3.1.4 Specific study aims and objectives 66
3.2 Methods 67
3.2.1 Children's centre sampling 67
3.2.3.1 Positive deviance approach 67
3.2.3.2 Positive deviant categorisation 67
3.2.3.3 Identification of positive deviants and low engagers 68
3.2.2 Participants, recruitment and consent 69
3.2.2.1 Participants, recruitment and consent: Children's centres 69
3.2.2.3 Participants, recruitment and consent: Interview participants 70
3.2.2.4 Participants, recruitment and consent: Focus group participants 70
3.2.3 Data collection 70
3.2.3.1 Data collection: ethnographical observations 71
3.2.3.2 Data collection: interviews and focus groups 71
3.2.4 Data analysis 72
3.3 Results 74
3.3.1 Sample 74
3.3.2 Barriers and levers to engagement 75
3.3.2.1 Key constructs 80

3.4 Discussion 89
3.4.1 Discussion of results 89
3.4.2 Reliability and Reflexivity.. 91
3.4.2.1 Reliability... 91
3.4.2.2 Reflexivity.. 92
3.4.3 Strengths and Limitations 93
3.5 Recommendations for participant engagement intervention 94
Chapter Four: Development of the participant engagement intervention96
4.1 Introduction 96
4.1.1 Aims and objectives 96
4.1.1.1 Aim 96
4.1.1.2 Objectives 96
4.1.2 Guiding framework 97
4.1.2.1 MRC: Framework for design and evaluation of complex interventions to improve health. (Campbell et al., 2000)97
4.1.2.2 Intervention Mapping (Bartholomew et al., 1998) 98
4.1.2.3 Behaviour Change Wheel (Michie et al., 2011) 100
4.2 Methods 103
4.2.1 Intervention development team 103
4.2.2 Parent advisory group 103
4.2.3 Stage One methods: Understanding the problem 105
4.2.3.1 Defining the problem in behavioural terms 105
4.2.3.2 Selecting the target behaviours............................. 105
4.2.3.3 Specify target behaviour.. 106
4.2.3.4 Identifying what needs to change 106
4.2.4 Stage Two methods: Identifying intervention options 106
4.2.5 Stage Three methods: Identifying content and implementation options 107
4.3 Results 107
4.3.1 Stage One results: Understanding the problem 107
4.3.1.1 Defining the problem in behavioural terms 107
4.3.1.2 Selecting and specifying the target behaviours 108
4.3.1.3 Identifying what needs to change 108
4.3.2 Stage two: Identifying intervention options (intervention functions) 120
4.3.3 Stage three: Identifying content and implementation options121

4.3.4 Participant engagement intervention components 124
4.3.5 Logic model of participant engagement intervention 127
4.4 Discussion 129
4.4.1 Strengths and Weaknesses 131
4.5 Conclusion 131
Chapter Five: Cluster randomised controlled trial and process evaluation methods 132
5.1 Introduction 132
5.1.1 MRC guidance on process evaluation research 132
5.1.2 Process evaluation frameworks 133
5.1.2.1 Process Evaluation Framework (Steckler and Linnan, 2002) 134
5.1.2.2 Fidelity Framework (Carroll et al., 2007) 135
5.1.2.3 Realist Evaluation (Pawson and Tilley, 1997) 137
5.1.2.4 Theory Based Evaluation (Weiss, 1997) 138
5.1.3 Approach used for the participant engagement intervention process evaluation 139
5.1.4 Research Objectives 140
5.2 Methods: Cluster randomised controlled trial 142
5.2.1 Trial design 142
5.2.2 Recruitment and consent 142
5.2.3 Randomisation 143
5.2.4 Intervention and control conditions 143
5.2.5 Outcomes 143
5.2.6 Sample size 144
5.2.7 Statistical analysis 144
5.2.8 Ethical approval 144
5.3 Methods: Process evaluation 145
5.3.1 Data collection 150
5.3.1.1 Data collection methods for research objective 1: Implementation 150
5.3.1.2 Data collection methods for research objective 2: Change mechanisms 152
5.3.1.3 Data collection methods for research objective 3: Behaviour change 154
5.3.1.4 Data collection methods for research objective 4: Contextual factors 155

5.3.2 Data analysis 156
5.3.2.1 Analysis of research objective 1: implementation.. 156
5.3.2.2 Analysis of research objective 2: change mechanisms 158
5.3.2.3 Analysis of research objective 3: behaviour change159
5.3.2.4 Analysis of research objective 4: contextual factors160
Chapter Six: Results from the cluster randomised controlled trial and process evaluation 162
6.1 Overview of Chapter 162
6.2 Cluster randomised controlled trial of the participant engagement intervention: Results 162
6.2.1Recruitment 162
6.2.2 Primary outcome data 163
6.2.3 Primary analysis 164
6.2.4 Secondary analysis 164
6.2.5 Local authority level enrolment and attendance 166
6.2.5.1 Enrolment 166
6.2.5.2 Attendance 167
6.3 Process evaluation of participant engagement intervention: Results 169
6.3.1 Results for research objective 1: implementation of the participant engagement intervention 170
6.3.1.1 Results: Dose delivered 170
6.3.1.2 Results: fidelity 171
6.3.1.3 Results: reach 175
6.3.2 Results for research objective 2: change mechanisms 176
6.3.2.1 Results: enactment of commissioner level theory of change 177
6.3.2.2 Results: enactment of manager level intervention. 179
6.3.3 Results for research objective 3: behaviour change......... 182
6.3.3.1 Results: comparison of behaviour change between trial arms (target behaviours 1-4[i]) 182
6.3.3.2 Results: performance of target behaviours in local authorities that received the intervention................... 184
6.3.3.3 Results: delivery of intervention and target behaviours 186
6.3.3.4 Results: performance of target behaviours and enrolment and completion outcomes. 186

6.3.4 Research objective 4: context 188
6.3.4.1 Results: children's centre characteristics 188
6.3.4.2 Results: key contextual themes derived from inductive qualitative analysis 189
6.3.5 Summary of findings... 194
6.3 Discussion... 196
6.4.1 Strengths and limitations 199
6.4.2 Implications for future research and practice................... 200
6.5 Conclusion 201
Chapter Seven: Overall discussion and implications 203
7.1 Overview of chapter 203
7.2 Summary of thesis.. 203
7.3 Key findings.. 203
7.3.1 Highlighting evidence gap 203
7.3.2 Implementation barriers to engagement.......................... 204
7.3.3 Intervention development process 205
7.3.4. Participant engagement intervention design 205
7.3.5Influence of context on intervention outcomes 206
7.4 Main strengths of the thesis 207
7.5 Main limitations of the thesis 208
7.6 Implications for research and practice....................................... 209
7.6.1 The value of formative research...................................... 209
7.6.2 Intervention development approach 209
7.6.3 Process evaluation data collection tools.......................... 210
7.6.4 Implementation context 210
7.6.5 Evaluation of engagement efforts.................................... 211
7.7 Conclusion 211
References... 212
List of Abbreviations 225

List of Tables

Table 2.1 Search strategy for literature review 24

Table 2.2 Extracted data from eligible papers 28

Table 3.1 Facilitators and barriers to parent engagement with parenting programmes (Mytton et al., 2014) 60

Table 3.*2* PARiHS constructs and sub constructs 61

Table 3.3 Consolidated for Implementation Research Domains and Constructs 65

Table 3.4: Extract of matrix presenting data from each participant group against theme (see results section for full table) 73

Table 3.5 Children's Centre Characteristics 74

Table 3.6 Interviews and focus group participant characteristics 75

Table 3.7 Identified constructs that are consistent with CFIR and literature on parent engagement with parenting programmes 76

Table 4.1 Long list of target behaviours 109

Table 4.2 Short list of target behaviours 114

Table 4.3 COM-B behavioural analysis to identify what needed to change for behaviours to occur 117

Table 4.4 Behaviour change techniques selected for inclusion in the participant engagement intervention 122

Table 5.1 Steckler and Linnan's (2002) Process Evaluation Framework134

Table 5.2 Realist terminology (Pawson and Tilley, 1997) 137

Table 5.3 Overview of methods for research objective 1: Implementation (of all levels of the intervention) 146

Table 5.4 Overview of methods for research objective 2: Change mechanisms (at the commissioner and manager level) 148

Table 5.5 Overview of methods for research objective 3: Behaviour change (at the commissioner and manager levels) 149

Table 5.6 Overview of methods for research objective 4: Context 150

Table 5.7 Sampling frame for process evaluation interviews 153

Table 5.8 Example of BCT scoring for intervention materials 157

Table 5.9 Example of BCT scoring for fidelity of delivery of manager workshops 158

Table 5.10 Example coding of responses on pre- and post-questionnaire 159

Table 5.11 Example of theme and code structure and supporting quote160

Table 6.1 Baseline characteristics of participating local authorities (Table taken from trial results paper with permission) 163

Table 6. 2 Primary outcomes: pre-randomisation proportions, outcome proportions and risk difference adjusted for stratification factors (Taken from trial results paper with permission) 165

Table 6.3 Number of centres meeting enrolment target from baseline to follow up (Trial data used to provide summaries with permission)166

Table 6.4 Number of centres meeting attendance target from baseline to follow up (Trial data used to provide summaries with permission)168

Table 6.5 Delivered intervention components in participating local authorities.. 170

Table 6.6 Incorporation of the specified behaviour change techniques in intervention materials.. 172

Table 6.7 Fidelity of delivery of manager and facilitator workshops (self-report) 175

Table 6.8 Interview participant summary 176

Table 6.9 Acceptability data from manager workshop evaluation forms180

Table 6.10 Number and percentage of centres that performed target behaviours 1-3 during follow up (data summary provided by trial statistician and used with permission) 183

Table 6.11 Number and percentage of centres that increased the number of programmes delivered during follow up (target behaviour 4[i])184

Table 6.12 Number and percent of centres that performed target behaviours in local authorities in the intervention arm............... 185

Table 6.13 Dose of intervention delivered, performance of target behaviours and trial outcomes 187

Table 6.14 Characteristics of participating centres provided by centre managers 188

List of Figures

Figure 1.1 Programme of PhD work and how this fits within NIHR CDF fellowship 20

Figure 2.1 Number of records identified, and papers included in the review 27

Figure 3.1 Matrix in which evidence, context and facilitation can either be expected to influence implementation outcomes in a negative or positive way (Kitson et al., 1998) 62

Figure 3.2 Practical, Robust Implementation and Sustainability Model (Feldstein and Glasgow, 2008) 63

Figure 4.1 Key elements of the development and evaluation process (MRC, 2008) 98

Figure 4.*2* Intervention Mapping protocol (Bartholomew et al., 1998) 99

Figure 4.3 COM-B model of Behaviour (Michie et al., 2011) 100

Figure 4.4 The Behaviour Change Wheel: A guide to designing interventions (Michie et al., 2011) 101

Figure 4.5 Behaviour change wheel stages (Michie, Van Stralen and West 2011) 102

Figure 4.6 Process used to develop participant engagement intervention 104

Figure 4.7 Logic model of participant engagement intervention 128

Figure 5.1 MRC guidance process evaluation framework 133

Figure 5.2 Relationship between implementation fidelity and intervention outcomes (Carroll et al., 2007) 136

Figure 5.3 Essential components for theory of change 138

Figure 5.4 Participant engagement intervention theory of change explored in process evaluation 141

Figure 5.5 Data collection timelines 145

Figure 6.1 Number of local authorities where enrolment levels increased, decreased or stayed the same from baseline to follow up. 167

Figure 6.2 Number of local authorities where attendance levels increased, decreased or stayed the same from baseline to follow up 169

Figure 6.3 Percent of centres performing target behaviours in each arm from those that delivered a programme (n=52) 184

Figure 6.4 Percent of centres performing target behaviours in local authorities in the intervention arm 185

Figure 6.5 Key findings of participant engagement intervention process evaluation 195

Chapter One: Introduction

1.1 Introduction to the thesis topic

1.1.1 Public health programmes

Public health programmes form part of the public health system that aims to prevent disease, prolong life, promote health, and reduce inequalities in health (World Health Organization, 1978, Griffiths et al., 2005). The term ‘public health programme’ describes a series of activities aimed at promoting health and well-being, or preventing ill-health, by changing the attitudes and behaviours of target groups (e.g., communities or populations) (Centers for Disease Control and Prevention, 2011). Public health programmes differ from clinical interventions which aim to treat or prevent disease in individuals with a clinical need (Rychetnik et al., 2002) . Currently, the evidence base for the effectiveness of public health programmes is mixed, with modest results reported overall (McCrabb et al., 2020). For instance, workplace programmes aimed at promoting physical activity show some evidence of effectiveness (Malik et al., 2014) but workplace nutritional interventions show limited to moderate results (Maes et al., 2012). There are inconsistencies in the effectiveness of universal parenting programmes on parenting self-efficacy and child behavioural outcomes (Lindsay and Totsika, 2017, Prinz et al., 2009, Eisner et al., 2012, Pontoppidan et al., 2016). The effect of family based obesity prevention programmes on child dietary intake and BMI z-score also differ (Skouteris et al., 2016, Adab et al., 2018, Bleich et al., 2013).

The varying effects observed for public health programmes can be a result of differences in the programme design and approach. However, modest effects reported in some public health programmes are often attributed to poor implementation, preventing them from achieving their optimal impact (MacDonald et al., 2016). As such, implementation has been described as the ‘Achilles heel of innovation’ (Tomm-Bonde et al., 2013). Contributory factors to poor implementation occur at multiple levels within a programme’s context. These include government and organisational policy, organisational culture and the attitudes and skills of individuals involved in a programmes’ implementation (Love et al., 2018, Damschroder et al., 2009). An implementation issue which is considered less often is participant engagement (Bamberger et al., 2014). Effective implementation not only relies on programmes being successfully delivered, but also on them being successfully received by participants in the target population (Berkel et al., 2011).

1.1.2 Participant engagement with public health programmes

Participant engagement is a broad ranging term that encompasses multiple stages of engagement, from a participant's intent to enrol on a programme to programme completion. The term can also include 'quality' of participation (Morawska and Sanders, 2006, Gonzalez et al., 2018) along with programme 'reach', the proportion of a programme's target population that attend the programme and the representativeness of that sample (Glasgow et al., 1999). In this thesis, participant engagement is defined throughout as programme enrolment and attendance.

Poor participant engagement has a number of implications. For instance, where programmes fail to attract the intended number of participants, there is an increased running cost per person, reducing cost effectiveness and sustainability. As a result, many programmes are cancelled before they start or end prematurely (Lindsay and Cullen, 2010). Further, where participants do not attend a sufficient amount of sessions, they are exposed to less of the programme's content, reducing its potential impact (Bamberger et al., 2014). Moreover, where programmes are designed to be delivered in a group format but few participants attend, group dynamics are impeded, reducing opportunities for peer support (Borek et al., 2019). Finally, low engagement hinders evaluation efforts, as poor sample sizes and inadequate representation of the target population limit conclusions and generalisability (Hinshaw et al., 2004). Therefore, optimising participant engagement can improve programme impact, value for money and sustainability, and enable rigorous evaluation.

In the literature, low rates of enrolment and/or attendance are reported across varying public health programmes. For example, diabetes prevention programmes that have demonstrated efficacy in a research context struggle to be implemented in a real-world setting due to low rates of participation (Aziz et al., 2015). Parenting programmes often report poor enrolment rates or high attrition (Hutchings et al., 2020, Axford et al., 2012, Wells et al., 2016) and family based obesity prevention programmes frequently report low attendance (Hull et al., 2018, Kaiser et al., 2018).

1.1.3 Barriers to participant engagement

Barriers to participant engagement have been well reported in the literature, particularly around parenting programmes. They can be broadly categorised into three areas: participant level factors such as social and cultural barriers and practical constraints, programme level factors (e.g. content and delivery) and structural factors, including availability of information and ease of access to the programme venue (La Placa and Corlyon, 2014, Love et al., 2018). A small number of studies have also described implementation factors on engagement such as programme

referral routes and the ability of service providers to adequately gain participant interest (Williams et al., 2012).

Additional barriers can also exist depending on the nature of the programme. A lack of motivation or perceived value may act as a barrier to engaging with programmes that comprise a physical activity component (Biedenweg et al., 2014, Devereux-Fitzgerald et al., 2016) and attracting parents to obesity prevention programmes can be a challenge if parents do not perceive there to be a need (Mehdizadeh et al., 2020). Feelings of stigma, fear and guilt have also been associated with parenting programmes (La Placa and Corlyon, 2014). Crucially, participants from underserved populations (e.g., low educational or socioeconomic status, or at high risk of child behavioural problems) are the least likely to attend but most likely to benefit from their support (Spoth and Redmond, 2000, Whelan et al., 2018), potentially exacerbating gaps in health inequalities.

1.1.4 Interventions to promote engagement

There are few examples in the literature of interventions designed to promote engagement with public health programmes; particularly those that have been rigorously tested. Of those that have been tested, the majority have been largely ineffective, or succeed at promoting enrolment or attendance but not both (Gonzalez et al., 2018). The quality of studies is also generally poor, and many fail to address specific barriers to engagement relevant to the programme's context, such as social or cultural barriers or accessibility of the programmes. A literature review undertaken to explore previous participant engagement interventions is provided in Chapter Two.

1.1.5 Obesity prevention programmes

Childhood obesity prevention is one area that is often prioritised by national and local governments in England (Local Government Association, 2017). Overweight and obesity in children can have serious physical and mental health implications that can track into adulthood; including type 2 diabetes, liver problems, bullying, low self-esteem and lower quality of life (Sharma et al., 2019). It is particularly prevalent in families living in the most deprived areas, where rates are more than double compared to those in the least deprived areas (Public Health England, 2019). The financial burden of obesity is also significant. In 2014/15, the cost of obesity and related ill health to the NHS in England was estimated at £6.1 billion per annum (Public Health England, 2017) . Obesity also contributes to local authorities' social care spending with direct costs estimated around £352 million per annum (Tremmel, 2017).

The development of health behaviours begins from birth and is largely influenced by parental behaviour and the home environment (Hayter et al., 2015), including eating habits, physical activity and sedentary behaviour patterns (Prentice and Jebb, 1995, Savage et al., 2007, Reilly et al., 2004). Obesity prevention programmes aimed at promoting positive health behaviours across the whole family are therefore one strategy that offers great potential for preventing obesity in children aged 0-5, and here there is some evidence of effectiveness and cost-effectiveness (Brown et al., 2019). However, in order that obesity programmes reach their potential, they need to reach an adequate proportion of the target population.

1.1.6 Health Exercise and Nutrition in the Really Young (HENRY)

One example of an obesity prevention programme which is widely commissioned by local authorities in England (approximately 40 local authorities) is a programme called HENRY (Health, Exercise and Nutrition in the Really Young). HENRY is delivered in a community setting (predominately children's centres) and aims to protect young children from the consequences of obesity by providing parents with the knowledge and skills to provide a healthy lifestyle for their families (Rudolf et al., 2010). The programme is delivered to parents of 0-5 year olds in a group format and consists of eight weekly two hour sessions covering topics such as parenting skills, emotional well-being, healthy nutrition and active lifestyles. Wider effects have also been reported on practitioner behaviours and children's centre eating environments (Willis et al., 2012). Whilst parents attend programme, their children attend a crèche that is provided at no cost to them. The HENRY programme was developed in 2009 by experts in behaviour change and childhood obesity. The effectiveness of HENRY on obesity prevention has not yet been determined but routine process data indicate that the programme is well received, and parents that attend report positive lifestyle changes, including increased fruit and vegetable intake and an increased frequency of family meals (Willis et al., 2016, Willis et al., 2014).

The children's centres in which HENRY is delivered are generally located in areas of high deprivation. Children's centres were developed in 2004 to build on the success of the sure start initiative, and aim to improve the health and well-being of children and their families, and reduce inequalities between disadvantaged families and their peers (Family Action, 2021, Lewis, 2011). Children's centres are predominately run by local authority governments and provide a core offer of childcare, early year's education, social support, and early year's intervention; including the delivery of public health programmes such as HENRY. Other delivered programmes include parenting programmes, English language courses, baby nurturing sessions (e.g. baby massage) and 'stay and play'. In 2010 there was estimated to be a peak

number of 3,620 children's centres across the UK, but this number is declining steadily due to the closure and amalgamation of centres brought on by Government austerity measures (Department for Education, 2019).

1.1.7 Delivery of HENRY programmes

HENRY programmes are commissioned out of local authority budgets. This includes the price of a yearly licence and the provision of training so that local teams can deliver the programme. Further costs include the staff resource required to plan and deliver the programmes along with the crèche facility provided to children of the parents that attend. HENRY training is delivered at two levels. The first is centre level 'core training' which provides staff members with in-depth knowledge of the HENRY approach, designed to influence the food and physical activity environment and support to engage in healthy conversations with parents. HENRY facilitator training is then attended by staff, usually family support workers, that are selected to deliver the programme. Alternatively, individuals from external health visiting or public health teams can also be trained to deliver the programme. Parents are usually approached to attend the programme by children's centre staff when visiting the centre or invited during outreach work. In common with other public health programmes, children's centres often struggle to attract and retain parents to HENRY. Data routinely collected by HENRY central office in 2015 showed that only 50% of centres enrolled the recommended minimum of eight parents per programme and just 55% of centres reached the attendance target of 75% of participants attending at least five out of eight sessions (Bryant et al., 2017). Thus, support was needed to promote HENRY enrolment and attendance levels so that more families could benefit from its support and to make better use of resources.

1.1.8 Summary of research topic

Poor implementation of public health programmes threaten their impact and sustainability, potentially risking financial waste and limiting programmes from reaching their target population. Promoting participant engagement is one area where implementation could be supported. Therefore, interventions developed to promote participant engagement are needed. This thesis describes the development and evaluation of a participant engagement intervention aimed at supporting children's centres to promote parent engagement with the HENRY programme. In the next section, the origin of the thesis is described, before the overall aims and objectives. An overview of the thesis structure is then provided.

1.2 Origin of the thesis

This PhD sits within a larger programme of work; a NIHR CDF fellowship project awarded to Dr Bryant (PhD supervisor) undertaken between 2015 and 2019. The fellowship work was designed to optimise the implementation of HENRY prior to assessing the feasibility of undertaking a definitive trial of its effectiveness. The fellowship work was developed in response to rising rates of obesity in preschool children and the need for evidence based approaches to prevent obesity. The NIHR CDF fellowship was split in to two work packages. Work package one consisted of the development and evaluation of a participant engagement intervention aimed at promoting parent engagement with HENRY. Work Package Two comprised a feasibility study to explore whether it was feasible to undertake a definitive trial of HENRY. At the start of the fellowship, it was agreed that the development of the participant engagement intervention would be led by the PhD, including primary research to understand the barriers and levers to engagement with HENRY. Within the CDF but outside of the PhD, a national cluster randomised trial of the participant engagement intervention was undertaken to test its effect. Alongside the trial, a nested process evaluation was conducted as part of the PhD work. As such, the PhD and fellowship work supported and complemented one another (Figure 1.1). Although the overall concept of the research was determined before the start of the PhD project, the design and methods used for each study were developed within the PhD. Both projects used HENRY as a key intervention case study but were aimed at being transferable to other public health programmes delivered within a community setting.

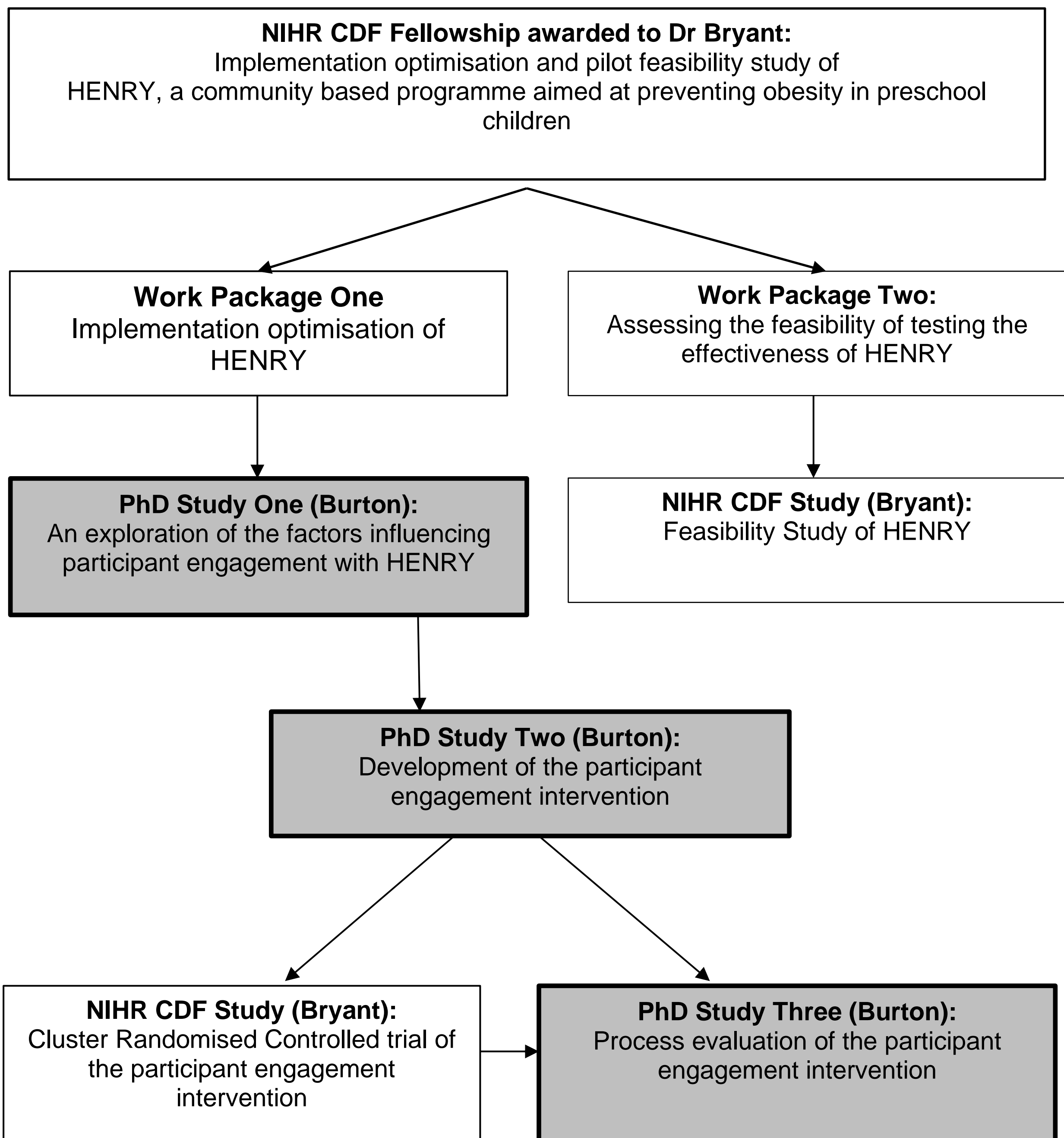


Figure 1.1 Programme of PhD work and how this fits within NIHR CDF fellowship

1.3 Aims and objectives

Aim

The overall aim of this PhD was to develop and evaluate a participant engagement intervention aimed at promoting parent engagement with HENRY.

Objectives

1. To summarise the literature on the effectiveness of previous interventions aimed at promoting engagement with a public health programme to inform potential strategies to test in the HENRY participant engagement intervention.

2. To undertake qualitative research in children's centres to identify factors influencing parent engagement with HENRY to inform target behaviours to address within the participant engagement intervention.

3. To assemble a multidisciplinary intervention development team and lead on the development of the HENRY participant engagement intervention using an appropriate intervention development framework.

4. To design and undertake a process evaluation of the HENRY participant engagement intervention to explore the underpinning 'theory of change' and offer insight into why the intervention did or did not work.

1.4 Structure of thesis

This thesis is made up of seven chapters, comprising a literature review and three independent studies that detail the development and evaluation of the HENRY participant engagement intervention. The thesis concludes with a final discussion on how the research contributes to the wider literature along with brief concluding remarks. An overview of each chapter is provided below:

Chapter Two presents a narrative literature review that was undertaken to identify the outcome of previous interventions aimed at promoting engagement with a public health programme. In this chapter, the quality of the available literature is discussed and existing gaps in the evidence are highlighted. The results are also considered within the context of the development of the participant engagement intervention.

Chapter Three describes a focused ethnography study (Study One) that was conducted in children's centres delivering HENRY programmes to explore factors influencing participant engagement with HENRY within the programme's context. In this chapter, a rationale for the study methods is provided, along with the results, followed by recommendations on where the participant engagement intervention should be directed.

In Chapter Four, the development of the HENRY participant engagement intervention is described (Study Two). The chapter begins with a discussion of potential intervention development frameworks that were considered for the study. A description of all aspects of the development process is provided. Intervention components are then described and a logic model presented.

Chapter Five details the methods used to evaluate the HENRY participant engagement intervention, including a summary of the cluster randomised controlled trial methods that were used to test its effectiveness in work outside of the thesis.

Chapter Six begins with summarising the results of the cluster randomised controlled trial. The process evaluation results are then presented to provide explanation of trial result and provide insight into whether the 'theory of change' was supported. Strengths and limitations of the intervention design are then discussed.

Chapter Seven discusses the key findings of the thesis in the context of the wider literature. Overall strengths and weaknesses of the thesis are then discussed. This chapter ends by considering the implications of the research and offers recommendations for future work.

Chapter Two: Existing evidence of the effect of public health programme participant engagement interventions – a review

2.1 Introduction

As described in the previous chapter, the aim of the PhD was to develop and evaluate an intervention aimed at promoting parent engagement with the obesity prevention programme, HENRY. This chapter describes a narrative literature review that was undertaken alongside the development of the HENRY participant engagement intervention to identify strategies that may have had the potential to work for the HENRY participant engagement intervention. The review was broad to identify evidence from a large range of public health programmes, but only studies describing the effect of a public health engagement intervention were explored as opposed to seeking broader learning from intervention evaluation studies (e.g., randomised controlled trials) where varying recruitment methods may have been evaluated. This was due to the review seeking to observe 'real-world' engagement outcomes as opposed to those obtained within a research context, as barriers to engage in an evaluation study could confound engagement to the public health programme being evaluated for reasons such as distrust in research or perceived inconvenience of taking part (Sheridan et al., 2020).

2.2 Aim and objectives

The aim of this literature review was to explore the literature on interventions that were developed and evaluated for effectiveness with the aim of promoting engagement with a public health programme.

The objectives were:

1. To develop a search strategy and run a literature search to find studies describing outcomes of participant engagement interventions aimed at promoting engagement with a public health programme.
2. To extract data on the nature of public health programmes, population groups, study design, engagement interventions and outcomes.
3. To critique the utility of the studies to support development of the HENRY participant engagement intervention.

2.3 Methods

2.3.1 Search strategy

The search included variants of the terms ‘evaluate’, ‘promote’, ‘engagement’ and ‘public health programme’ (Table 2.1). Words synonymous with ‘engagement’ and ‘public health programme’ were limited to title search only as the number of studies identified without this limitation was too high to process (191,000 papers). During development of the search strategy, search terms specifying possible types of public health programme were considered (e.g., ‘obesity prevention’), but this did not add to the search as broader terms within the ‘public health programme’ category encapsulated these. Wider search terms for ‘promote’ and ‘engagement’ categories were added to the search strategy as they were identified during initial scoping. The search was run in Scopus, Ovid MEDLINE (R) (1946 to January 2021), Embase (1996 to January 2021) and PsychINFO (2002 to January 2021). Relevant and eligible articles identified from papers that underwent full text review were also included.

Table 2.1 Search strategy for literature review

Study design (key word/topic)	**Primary aim (key word/topic)**	**Engagement (title search only)**	**Public health programme (title search only)**
Trial Evaluation Effectiveness Outcome Test	Promote* Optimise Optimize Enhance Increase Improve	AND Recruitment Attendance Completers Engagement Enrolment Reach Retain Participation Participants Retention Uptake	“Public health” Prevention “Health promotion” Programme Program Intervention

2.3.2 Eligibility Criteria

Inclusion and exclusion criteria were applied to narrow down studies to just those relevant to the research question.

2.3.2.1 Inclusion criteria

- Studies where the participant engagement intervention was aimed at promoting engagement with a public health programme (e.g. heath promotion or disease prevention programme).
- Experimental studies evaluating an intervention to increase participant engagement with a public health programme including any study design (e.g. RCT, pilot, pre-post, quasi-experimental).

2.3.2.2 Exclusion criteria

- Studies that had not evaluated the outcome of a participant engagement intervention.
- Studies where the intervention aimed to increase engagement with a clinical intervention or appointment (including screening appointments).
- Studies aimed at promoting participant engagement within clinical populations groups.
- Digital interventions where programme attendance was not required.
- Studies aimed at improving the engagement of individuals <18 years of age.

2.3.3 Data extraction and synthesis

Data were extracted on: the target population, evaluation design, nature of public health programme, engagement intervention, outcome measures and results and entered into an Excel spreadsheet. Studies were grouped according to the type of engagement intervention that emerged from the data (e.g., financial incentive, testimonial etc.) so that the outcomes of each intervention could be compared and contrasted within and between groups. Strengths and limitations of the studies were also considered to explore whether the results could be transferred to the participant engagement intervention.

2.4 Results

The search was undertaken at two time points; the first in September 2015 to contribute to the development of the HENRY participant engagement intervention, and the second in January 2021 so that new papers could be included and discussed in the thesis. The search undertaken in 2015 yielded nine eligible papers that were included in the review. An additional three papers were identified in the second search that were published between October 2015 and January 2021. The majority of excluded papers included non-experimental studies, or described

interventions aimed at improving engagement with clinical appointments or treatment (Figure 2.1).

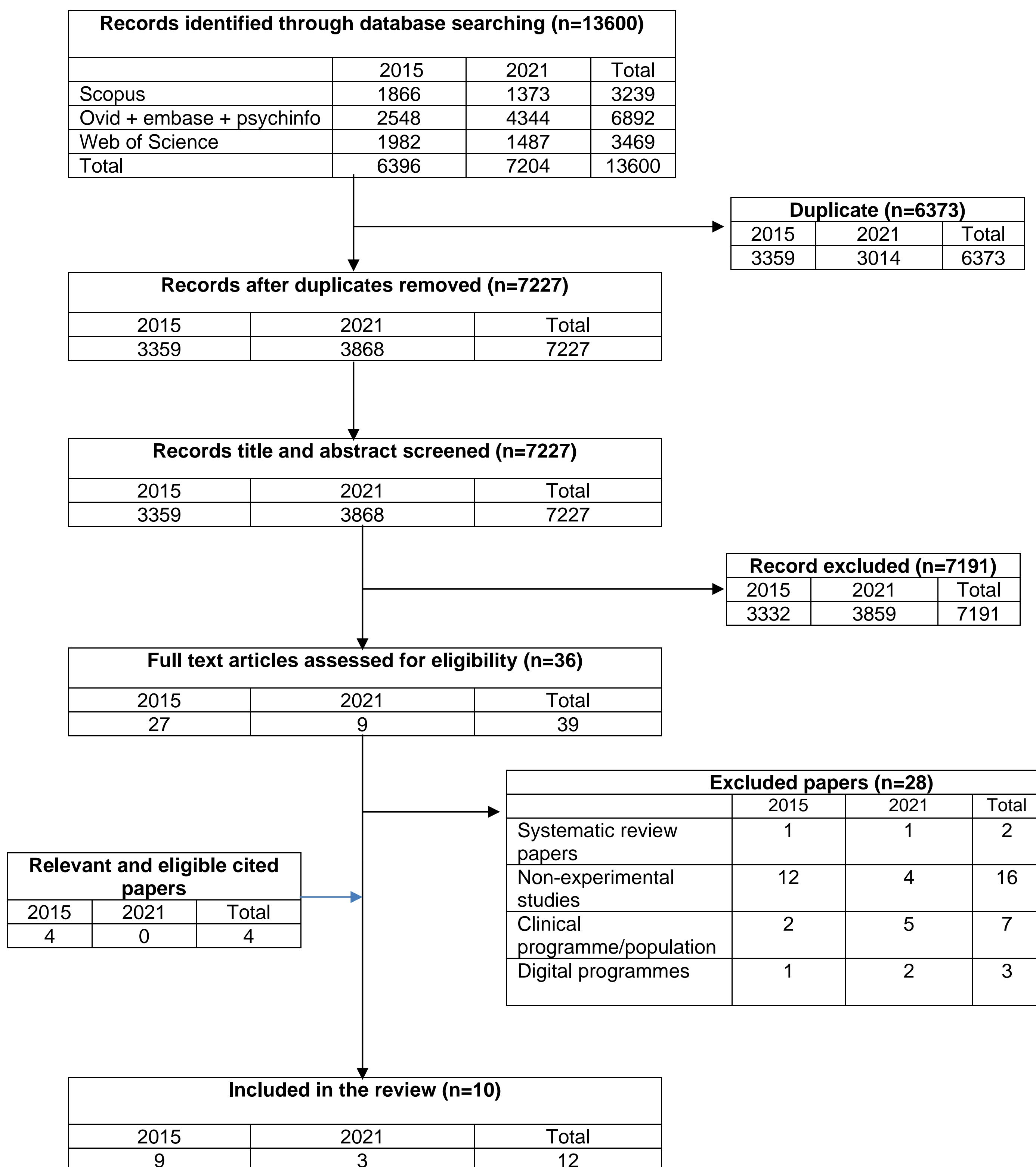


Figure 2.1 Number of records identified, and papers included in the review

Table 2.2 Extracted data from eligible papers

I = intervention C = control

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
Hennrikus et al. (2002)	Employees identifying themselves as smokers from varying worksites in US	Randomised trial Worksites (n=24) randomised to one of six intervention conditions All employees invited to complete baseline survey to identify 'smoker' population	Worksite smoking cessation programme delivered in either group or telephone format Group programme: 13 group sessions. Telephone programme: 3-6 telephone counselling sessions.	Monetary incentive and differing programme format Incentive=$10 for joining and $20 for completion I_1 = Group format + incentive I_2 = Group format - no incentive I_3 = Telephone format + incentive I_4 = Telephone format - no incentive I_5 = Choice of format + incentive I_6 = Choice of format + no incentive	Participation rate (% of participants registered from 'smoker' population)	2402 employees reported being a smoker. Programme participation at each site ranged from 4.7%-36.7% Participation rate for each intervention condition from smoker population: I_1 = 18.9% (Group + incentive) I_2 = 13.0% (Group + no incentive) I_3 = 18.6% (Telephone + incentive) I_4 = 14.3% (Telephone + no incentive) I_5 = 23.3% (Choice + incentive) I_6 = 13.0% (Choice + no incentive) **Participation rate significantly differed between incentive and non-incentive conditions (*p*=<0.5)**
Heinrichs (2006)	Families of children attending preschools in disadvantaged area in Germany	Cluster randomised trial Preschools (n=15) matched on size and randomised to one of four recruitment conditions	Parenting programme delivered in group or individual format. Individual format, 10 one-hour sessions	Monetary incentive and either group or individual programme format Incentive= up to €145 depending on how many sessions attended	Initially enrolled (Number of families providing name and contact details)	248 (36%) families initially enrolled out of a potential 690 Of which: 93 families (46%) Incentive 155 families (26%) non-incentive **Initial enrolment significantly differed between incentive and non-incentive conditions (p=<0.5)** No effect for format

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
			delivered at parent's home Group format 8 two-hour sessions delivered in respective school	I_1 = Individual format + no incentive I_2 = Group format + no incentive I_3 = Indvidual format +incentive I_4 =Group format + incentive All families received €12.50 for the return of baseline survey	Initially enrolled but subsequently declined (Number of enrolled families that did not schedule baseline appointment and/or did not attend programme)	51 (20.6%) initially enrolled families subsequently declined Initial enrolment did not significantly differ between conditions
					Dropouts (Number of families from the intervention sample that attended at least one session, but dropped out before follow up assessment)	10 (5.1%). families dropped out from intervention sample (initially enrolled families that did not subsequently decline) No statistical test undertaken as sample too small
					Completers (Number of families that attended at least one session and follow up assessment from intervention sample).	187 families (94.9%) from intervention sample completed at least one session and follow up assessment **Effect observed in favour of incentive condition in enrolled sample (p=<0.5) but not in total sample**

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
Diaz and Perez (2009)	Families of children attending secondary schools in Spain located in areas with high risk of drug abuse	Quasi experimental design One out of three participating schools selected at random to receive intervention	Drug abuse prevention programme comprising seven 'main' sessions and four 'maintenance' sessions	Monetary incentive I = €10 Euro shopping voucher received for each "main" session attended (up to 7 sessions) C = no shopping voucher	Attendance at the main programme sessions (Mean sessions attended)	211 families invited to the programme (n=76 intervention; n=144 control) 5.7% attended at least one programme (n=6 intervention; n=6 control) Mean attendance at main sessions from total population (n=211) I = *M* 0.55 / 7 sessions C = *M* 0.08 / 7 sessions **Attendance at main sessions significantly differed between intervention and control conditions (p=0.004)**
					Attendance at maintenance sessions (Mean sessions attended)	Mean maintenance session attendance from total sample: I = *M* 0.95 / 4 sessions C = *M* 0.02 / 4 sessions **Attendance at maintenance sessions significantly differed between intervention and control conditions (*p*=.007)**
					Whole programme attendance (Mean sessions attended)	Mean whole programme attendance from total sample: I = *M* 2.67 sessions intervention C = *M* 0.1 sessions control **Whole programme attendance significantly differed between intervention and control conditions (*p*=0.004)**

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
Dumas et al. (2010)	Families of children attending day-care centres that served economically disadvantaged and ethnically diverse populations in the US	Randomised trial Day-care centres (n=50) randomised to intervention or control at the point of recruitment	Parenting programme comprising eight group sessions	Monetary incentive I = up to $68 received depending on number of sessions attended C = no financial incentive	Intent to enrol (Number of families returning a baseline survey specifying intent to enrol)	From the total population of 4098, 1050 (26.5%) families specified intent to enrol Of which: I = 582 (55.4%) C = 468 (44.6%) **Intent to enrol significantly differed between intervention and control conditions (p=<0.5)**
				All families received $35 for research participation All families receive free childcare, meal and transport	Enrolment (Number of families returning registration form)	From the intent to enrol sample of 1,050 parents, 610 (58%) went on to enrol: I = 319 (52.3%) C = 291 (47.9%) Enrolment did not significantly differ between intervention and control conditions)
					Attendance (Number of sessions attended and point of drop out)	Attendance did not significantly differ between intervention and control conditions *(data not summarised per arm)*
					Quality of participation (Self-reported at the end of each session).	Quality of participation did not significantly differ between intervention and control conditions (*no data provided*)

<table>
<tr><th>Study</th><th>Target population</th><th>Evaluation design</th><th>Public health programme</th><th>Engagement intervention</th><th>Engagement outcomes</th><th>Results</th></tr>
<tr><td rowspan="3">Gross et al. (2011)</td><td rowspan="3">Families of children attending childcare centres where >90% families were eligible for subsidised childcare</td><td rowspan="3">Cluster randomised trial

Childcare centres (n=8) matched on size, racial/ethnic composition, percentage of single parent households and median income and then randomised to intervention or control</td><td rowspan="3">Parenting programme comprising 12 group sessions</td><td rowspan="3">Monetary incentive

Intervention = Parents offered a discount on their childcare bill contingent with weekly attendance at programme

I = Individual incentive amounts varied based on the size of the parents' weekly childcare bill

C=no financial incentive

All participants received $30 gift card for completion of research assessment

All families receive free childcare, meal ad transport</td><td>Enrolled

(number of eligible parents who agreed to participate)</td><td>From a potential sample of 792 eligible parents (n=395 intervention; n=397 control), 174 enrolled.

Of which:
I = 93 / 395 parents (23.5%)
C = 81 / 397 parents (20.4%)

Enrolment did not significantly differ between intervention and control conditions</td></tr>
<tr><td>Attendance

(mean sessions attended)</td><td>Mean sessions attended of enrolled sample:

I = M 6.26 / 12 sessions
C = M 5.86 / 12 sessions

Attendance did not significantly differ between intervention and control conditions.</td></tr>
<tr><td>Engagement

(Score assigned by group leader using Likert scale questionnaire)</td><td>Mean engagement score of enrolled sample:

I = M 3.2 / 4
C = M 3.3 / 4

Engagement did not significantly differ between intervention and control conditions</td></tr>
</table>

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
Rodriguez et al. (2020)	Families of children attending day care centres in the US that served families that were economically disadvantaged and ethnically diverse	Cluster randomised trial Day care centres (n=50) randomly assigned to one of four conditions	Parenting programme comprising 8 group sessions	Monetary incentive and mindfulness training Monetary incentive = up to $68 if all sessions attended Mindfulness training incorporated into parenting programme I_1 = Programme as usual I_2 = monetary incentive I_3 = parent mindfulness training I_4 = monetary incentive and mindfulness training All families receive free childcare, meal and transport.	Intent to enrol (Parents indicating on pre-programme survey that they would like to enrol)	Intent to enrol did not significantly differ between groups (data not summarised per arm)
					Actual enrolment (Parents returning registration form and attending at least one session)	From an initial sample of 1050 parents, 610 enrolled: I_1 = 141 parents I_2 = 121 parents I_3 = 150 parents I_4 = 198 parents Significance of group differences not reported
					Attendance at sessions (Number of sessions attended)	**I_2 and I_4 conditions had significantly better attendance than the I_1 condition** *(data not summarised per arm)*
					Quality of participation (Score assigned by group leader using Likert scale questionnaire)	No significant differences between I_1 and I_2, I_3 and I_4 (*data not summarised per arm*)

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
Emont and Cummings (1992)	Employees identifying themselves as smokers from car dealerships in the US	Quasi-experimental Car dealerships (n=67) randomly allocated to intervention or control condition All employees sent baseline questionnaire to identify 'smoker' population	Worksite smoking cessation programme consisting of three weekly group sessions	Prize draw ("dinner for two") I = participants offered a chance to win a dinner for two in a local restaurant if they attended the first session C = no prize draw offered	Participation rate (% of participants enrolled from 'smoker' population)	844 employees reported being a smoker across all sites. 56 (6.6%) smokers participated in programme Participation at each site ranged between 0%-40% Average participation rate between arms: I = 6.3% (prize draw) C = 6.7% (no prize draw) Participation rate did not significantly differ between intervention and control conditions

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
Spoth and Redmond (1994)	Families of six and /or seventh graders attending two rural schools in the US that had high proportion of children eligible for free school lunch	Quasi-experimental Randomly selected subset of families assigned to intervention (n=137). All other families assigned to control (n=250)	Substance abuse prevention programme consisting of five group sessions	Manipulated recruitment strategy Reduced time commitment I=Agreement to take part in study in the first instance. Followed by agreement to take part in programme after baseline study assessment C=Agreement to take part in study and programme participation	Agreement to take part (including pre-programme assessment) (Number of families from total sample)	Total sample = 387 families (n=137 intervention; 250 control) Agreement to take part: I = 90 / 137 families (65.7%) C = 130 / 250 families (52.0%) **Agreement to take part significantly differed between intervention and control conditions (*p*=<0.01)**
					Programme attendance (% families attending twp or more sessions from enrolled sample)	Programme attendance: % families attending 5 or more sessions (based on a sub-sample of 103 enrolled participants (n=41 intervention; n=62 control) I = 70.6% families C = 52.7% families Programme attendance did not significantly differ between groups

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
Winslow et al. (2016)	Families of children attending an elementary school in poverty-stricken, urban neighbourhood in the US where the majority of parents were of Mexican decent	Randomised trial Participants (n=160) invited to a pre-study assessment. Those completing the assessment were randomised to intervention or control	Parenting programme consisting of 8-12 sessions	Manipulated recruitment strategy I = programme brochure, testimonial flyer, teacher endorsement, group leader engagement call, reminder calls C = programme brochure All participants compensated $50 for pre-study assessment	Enrolment (% families enrolling on the programme following randomisation)	From randomly selected sample of 160 families, 122 were eligible and randomised Of which I = 74% families enrolled C = 69% families enrolled Enrolment did not significantly differ between groups
					Programme initiation (Number of families attending at least one session)	Programme initiation from families enrolled on programme I = 64% families initiated C = 36% families initiated Programme initiation did not significantly differ between intervention and control conditions in total sample **Significant effect observed when controlling for child concentration problem (*p*=<0.01)**
					Attendance (sessions attended between 0-8)	Attendance did not differ between groups from those who initiated (*attendance data not summarised per arm*)

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
Abraczinskas et al. (2020) (Follow up study to Winslow et al. testing the intervention in real-world conditions)	Caregivers of students attending one of five participating elementary schools in a large urban school district serving predominately low income families	Randomised controlled trial Parents randomly assigned to one of five conditions (n=1,338)	Parenting programme with 4 group sessions and 4 individual telephone sessions	Manipulated recruitment strategy Recruitment package as described above (Winslow et al) compared with individual components of the package in addition to engagement as usual (EAU) I_1 = EAU + information flyer I_2 = EAU + testimonial booklet I_3 = EAU + teacher endorsement I_4 = EAU + telephone call I_5 = Full package Research participation vs non-research participation was also explored with a subsample (25% of total sample) not invited to complete surveys.	Enrolment (% families enrolled from total sample)	Total sample = 1276 eligible children (n=1252 survey; n=218 no survey) % enrolled by intervention condition and research survey condition: I_1 = 12% survey 5% no survey I_2 = 12% survey 10% no survey I_3 = 20% survey 28% no survey I_4 = 42% survey 32% no survey I_5 = 41% survey 30% no survey **I_1 (flyer), I_2 (testimonial) and I_3 (teacher endorsement) significantly lower than I_5 (full package)** **I_3 (Teacher endorsement), I_4 recruitment call and I_5 (full package) significantly higher than I_1 (flyer)** Survey condition not significantly related to enrolment

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
				Those completing surveys (screening, post randomisation and follow up surveys) could receive up to $110	Initiation (% families attending at least one session from total sample)	% initiated from total sample by intervention condition and research survey condition I_1 = 11% survey 3% no survey I_2 = 11% survey 8% no survey I_3 = 13% survey 15% no survey I_4 = 25% survey 22% no survey I_5 = 27% survey 18% no survey **I_1 (flyer), I_2 (testimonial) and I_3 (teacher endorsement) significantly lower than I_5 (full package)** **I_4 (Recruitment call) significantly higher than flyer** Survey condition not significantly related to enrolment
					Completion (% families attending 3 out of four group sessions from total sample)	% completed from total sample by intervention condition and research survey condition I_1 = 9% survey 3% no survey I_2 = 10% survey 3% no survey I_3 = 11% survey 13% no survey I_4 = 19% survey 11% no survey I_5 = 20% survey 5% no survey Completion did not significantly differ between groups **Survey participants significantly more likely to complete programme (from total sample) ($p=<0.5$)**

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
Murray et al. (2015)	Families mandated to attend a parenting programme in the US	Randomised trial Parents enrolled on to a parent training programme that consented to take part in study (n=117) randomly assigned to intervention or control	Parenting programme consisting of 10 group sessions. Participants given the option to attend 'make-up' session if they miss a 'main' session	SMS reminder I = text message reminders sent to participants on the day before each class C = no text message	Attendance at the main sessions (Number of sessions attended)	Attendance at main sessions: From a total sample of 117 families (n=63 intervention; n=54 control) Number of sessions attended: I = *M* 7.0 / 10 sessions C = *M* 6.7 / 10 sessions Attendance at main sessions did not significantly differ between intervention and control conditions
					Attendance at make-up sessions (% families attending at least one make up session)	% families attending at least one make-up session : I = 67% families intervention C = 52% families control Attendance at make-up sessions did not significantly differ between intervention and control conditions
					Completion (% families attending all sessions).	% families attending all sessions: I = 79% families C = 63% families **Completion significantly differed between intervention and control conditions (p=0.049)**

Study	Target population	Evaluation design	Public health programme	Engagement intervention	Engagement outcomes	Results
(Morawska et al., 2011) Study One	Parents in Australia (no further information provided)	Participants (n=70) randomly assigned to one of three conditions before completing questionnaire	Parenting programme typically consisting of 8-12 group sessions	Testimonial I_1 = Participants view a testimonial for the programme given by an 'expert' (clinical psychologist) I_2 = Participants view a testimonial for the programme given by a parent of a child with behavioural problems C = Participants do not view testimonial	Likelihood of attending parenting programme (Score assigned on a seven-point Likert scale).	Likelihood of attending parenting programme Sample = 70 parents Scores out of 7 (0=definitely not-7=definitely yes) I_1 = *M* 5.97 / 7 (expert) I_2 = *M* 5.81 / 7 (parent) C = *M* 5.65 / 7 (no testimonial) Likelihood of attending parenting programme did not significantly differ between groups
(Morawska et al., 2011) Study Two	Parents in Australia (no further information provided)	Participants (n=73) randomly assigned to one of two conditions before completing questionnaire	Parenting programme typically consisting of 8-12 group sessions	I_1 = Participants view a'non-fear' testimonial delivered by a child clinical psychologist I_2 = Participants view a 'fear' testimonial delivered by a child clinical psychologist	Would like to try Triple P in the future (% of families answering yes on questionnaire item)	Parents that would like to try parenting programme in the future: Sample= 73 parents I_1 = 58.8% parents (non-fear) I_2 = 59.1% parents (fear) Parents that would like to try parenting programme in the future did not significantly differ between groups

2.4.1 Engagement interventions

The review identified 12 eligible studies that were published between 1996 and 2020. The studies had varying designs, including randomised trials, cluster randomised trials and quasi experimental studies. Sample sizes ranged from 70 to 2,402 and several engagement outcomes were measured. The majority of studies tested an intervention to promote engagement with a parenting programme (Abraczinskas et al., 2020, Rodriguez et al., 2020, Winslow et al., 2016, Murray et al., 2015, Gross et al., 2011, Dumas et al., 2010, Heinrichs, 2006, Morawska et al., 2011). Two involved family based substance abuse prevention programmes (Diaz and Perez, 2009, Spoth and Redmond, 1994) and two aimed to promote engagement with worksite smoking cessation programmes (Emont and Cummings, 1992, Hennrikus et al., 2002). Six types of engagement strategy were tested; monetary incentive, programme format, prize draw incentive, manipulated promotional strategies, text message reminders and testimonials. The outcomes observed for each of these engagement strategies are described below.

2.4.1.1 Monetary incentives

Five studies tested the effect of a monetary incentive on engagement with a public health programme. Four of these sought to promote engagement with a parenting programme delivered in a school or preschool setting located in economically disadvantaged and/or ethnically diverse populations (Rodriguez et al., 2020, Gross et al., 2011, Dumas et al., 2010, Diaz and Perez, 2009). A further study tested a monetary incentive to promote engagement with a smoking cessation programme in a random selection of worksites (Hennrikus et al., 2002). The monetary incentives being offered differed between studies. Hennrikus et al. (2002) offered $10 upon enrolment and $20 for completing three quarters of the smoking cessation programme. Diaz and Perez (2009) offered shopping vouchers, with a cumulative value of $70 the more sessions attended. Dumas et al. (2010) and Rodriguez et al. (2020) offered a cumulative value of $68, and Heinrich offered the largest cumulative value of $145. The authors describe how monetary incentives were selected due to their widely adopted use in the field, and to build upon the evidence base. In contrast, Gross et al. (2011) offered a discounted childcare incentive whereby those with a lower existing bill received less than those with a higher bill (the value ranging from $0 to $35 per week respectively). They proposed that this was more cost effective than a monetary incentive and more achievable in a real-world setting.

Engagement outcome measures varied across studies, including intent to enrol (Dumas et al., 2010, Rodriguez et al., 2020). Actual enrolment or registration (Rodriguez et al., 2020, Gross et al., 2011, Dumas et al., 2010, Heinrichs, 2006, Hennrikus et al., 2002) and attendance (Diaz and Perez, 2009, Dumas et al., 2010, Gross et al., 2011, Rodriguez et al., 2020) 'Completers' were also measured by Heinrichs (2006) who defined this as the number of participants attending at least one programme session plus a follow up assessment.

All but one study observed some effect of the financial incentive (Gross et al., 2011). Dumas et al. (2010), Heinrichs (2006) and Hennrikus et al. (2002) reported significantly higher numbers of intent to enrol, enrolment or participation in the incentive condition than the non-incentive condition and three of the five studies (Rodriguez et al., 2020, Diaz and Perez, 2009, Heinrichs, 2006) observed greater attendance or 'completion'. Gross et al. (2011), reported no effect on enrolment or attendance which suggests that discounted childcare as opposed to money was not as strong an incentive. However, the utility of offering childcare vouchers was not tested consistently as these varied in value. Further, the authors describe that during ad-hoc follow up interviews, many participants reported not receiving the discount at all, therefore weaknesses in their intervention fidelity made it difficult to draw firm conclusions about the potential effectiveness of the intervention.

All studies had weaknesses in their design which limited the strength of their results. None of the studies reported a sample size calculation and they all either failed to report blinding procedures (Rodriguez et al., 2020, Gross et al., 2011, Dumas et al., 2010, Diaz and Perez, 2009, Hennrikus et al., 2002) or reported that blinding of the recruiter was not possible due to them being responsible for delivering the programme (Heinrichs, 2006), potentially increasing the risk of bias. In Diaz and Perez's (2009) study, only six participants in each group attended at least one session resulting in an extremely small sample. Notably, in this study, enrolment was not reported as a primary outcome, but if so, a null effect would have been observed suggesting some reporting bias. Some of the studies offered a monetary incentive upon completion of research assessments (Heinrichs, 2006, Dumas et al., 2010, Gross et al., 2011), or offered free transport, dinner and childcare (Rodriguez et al., 2020, Gross et al., 2011, Dumas et al., 2010). This could have incentivised participants in both arms to enrol and attend, confounding the impact of the incentive. Further, Heinrichs (2006) definition of 'completion' (attendance at follow up research assessment and at least one programme) was not reflective of full programme attendance

and confounded research and engagement outcomes making translation of the result difficult. Therefore, while the studies showed some benefit of financial incentives on engagement, there were substantial issues with the quality of the papers, making it difficult to draw conclusions.

2.4.1.2 Programme format

Three studies described above also considered the impact of using different formats for programme delivery on engagement. Heinrichs (2006) and Hennrikus et al. (2002) compared group programme format to individual/telephone format and Rodriguez et al. (2020) tested the effect of adding a mindfulness component to the programme. Heinrichs (2006), proposed that delivering a parenting programme in an individual format would promote engagement as parents would feel less judged than in a group. Hennrikus et al. (2002) proposed that offering a smoking cessation programme in a telephone format would be more convenient and accessible, thus promoting engagement. Rodriguez et al. (2020) suggested a mindfulness component might promote engagement by reducing stress. However, variations in programme format were largely ineffective. Individual and telephone formats observed no effect, but Rodriguez et al. (2020) reported that the monetary incentive plus a mindfulness condition observed significantly better attendance. However, the mindfulness component by itself was not found to be effective. As described above, all of these studies had limitations in their design which could have biased the results (e.g., the effect of incentives such as free childcare, meal and transport which might have confounded the research) Overall, the evidence suggesting no significant effect of programme format on participant engagement was consistent across studies.

2.4.1.3 Prize draw incentive

One study tested a ‘dinner for two’ prize draw incentive to promote participation in a worksite smoking cessation programme. The authors described that this method had demonstrated effectiveness in previous studies. Emont and Cummings (1992) used a quasi-experimental design whereby 67 car dealerships were randomly selected to the intervention or control condition. The programme was promoted in all worksites with employees in the intervention sites being offered a chance to win ‘dinner for two’ in a local restaurant if they attended the first session. Just fifty-six employees (6.6% of total sample) participated in the programme and there was no difference in participation between groups.

The lack of effect reported by Emont and Cummings (1992) contrasts with that of Hennrikus et al. (2002) who also aimed to promote engagement to a worksite smoking cessation programme, this time by testing a relatively small monetary incentive of up to $30 that was found to promote participation. However, these studies varied in design and quality, making the results less comparable. Moreover, neither study defined 'programme participation', so it is unclear how consistent outcomes were between studies. Nevertheless, Hennrikus et al. (2002) used a more robust study design, suggesting more reliable results. They adopted a randomised trial design as opposed to the quasi experimental design used by Emont and Cummings (1992). Hennrikus et al. (2002) also recruited a more generalisable sample, comprising a range of worksites (including manufacturing, health care, government and private companies) and representation from varying educational levels, marital status and gender, in contrast to Emont and Cummings (1992), whose sample comprised mainly male, married, salespeople working in a car dealership. Conversely, Emont and Cummings (1992) reported reasons for non-participation in the programme, with 60% of respondents reporting that they were not ready to stop smoking. As the studies were undertaken 10 years apart, attitudes to smoking may have changed across the whole population and it was perhaps not surprising that uptake was greater in the later study.

2.4.1.4 Manipulated recruitment strategies

Three studies tested a manipulated recruitment strategy to promote engagement with a public health programme. Spoth and Redmond (1994) aimed to promote family engagement with a drug abuse prevention programme delivered in a school setting and Winslow et al. (2016) and Abraczinskas et al. (2020) aimed to promote engagement with a parenting programme, also delivered in a school setting. Spoth and Redmond's (1994) intervention involved manipulation of the initial time commitment required from families following introduction to the programme. In the control condition, participants were required to commit to attending the programme along with undergoing a pre-and-post research assessment. In contrast, families in the intervention condition were only required to commit to a pre-programme assessment before deciding whether or not to enrol. The main outcomes measured by Spoth and Redmond (1994) were 'agreement to take part' and attendance on the programme. They reported that a significantly higher percentage of families 'agreed to take part' in the intervention condition but there was no effect on attendance.

Winslow et al. (2016) tested a multi-component 'engagement package' comprising: a programme brochure, testimonial flyer, teacher endorsement, group leader engagement call and reminder calls, against an engagement as usual approach. In a follow up study, Abraczinskas et al. (2020) tested the same engagement package in a similar population but under 'real world' conditions, whereby the intervention and programme were delivered by school personnel as opposed to a research team. Abraczinskas and colleagues (2020) also explored the impact of individual components of the package, and assessed whether incentivised research participation (survey completion) influenced engagement. Both studies measured enrolment, initiation (defined as attending at least one session) and attendance. Winslow et al. (2016) observed a significant effect for programme initiation when controlling for child behavioural problems, but no effect in the total population. Abraczinskas et al. (2020) reported that the full 'engagement package' was effective at promoting enrolment and initiation but not completion. Therefore, all showed promise for initial stages of recruitment but not on attendance.

In contrast to all other studies identified in the review, the interventions tested by Spoth and Redmond (1994) and Winslow et al. (2016) were underpinned by behavioural theory. Spoth and Redmond (1994) described how their intervention was underpinned by the Health Belief Model (Rosenstock, 1974; 1990), by which reduced time commitment was proposed to overcome barriers associated with a perceived lack of time. Research assessments were also proposed to encourage participants to evaluate their need of the programme to increase motivations to engage. The intervention developed by Winslow et al. (2016) used a theory-driven and community-based participatory approach. Literature was reviewed to identify and address modifiable constructs known to predict engagement, and community stakeholders were involved in designing the intervention to ensure the strategy was culturally appropriate for the target population (Latina Mexican). However, although the interventions were underpinned by theory, they pertained by design only to the initial stages of engagement (recruitment) which likely resulted in them being ineffective for attendance.

Studies by Spoth and Redmond (1994) and Winslow et al. (2016) had limitations in their design which made the results less reliable. Spoth and Redmond (1994) only measured attendance for a subsample of the study population. In addition, participant characteristics were not reported, so it was unclear how well-matched participants were between groups and how generalisable the results were to the target population. Winslow et al. (2016) used a robust randomised trial design,

but a sample size calculation was not reported and the authors described that the blinding of assessors was not possible for practical reasons, which was a recognised limitation. As previously described, their sample was recruited from just one school and participants were compensated $50 for taking part, thus increasing the risk of selection bias. In addition, although the engagement package was specifically aimed at being culturally appropriate for the Latina Mexican population (which made up 95% of the study sample), this restricted generalisability to only this population. The study by Abraczinskas et al. (2020) testing the same engagement package addressed some of these limitations. They undertook the study in 'real world conditions', whereby all eligible families across five schools were included in the sample (n=1470). Abraczinskas et al. (2020) was the only study to report a sample size calculation describing the power to detect an effect. Baseline characteristics were more representative of the general population than Winslow et al. (2016) (i.e., 55.8% Hispanic; 27.4% Non-Hispanic white; 7.2% Native American; 6.5% African American). Abraczinskas et al. (2020) also disentangled the effect of the whole engagement package, identifying which components were likely to have the biggest impact. Their investigation of survey vs non survey participation was also compelling, reporting that survey participation was significantly associated with programme completion, supporting that research participation does influence decisions to attend. The lack of assessor blinding however did not appear to be addressed as this was not described by the authors.

2.4.1.5 Text message reminders

Murray et al. (2015) tested the effect of text message reminders on increasing attendance and completion to a parenting programme delivered in a community setting. In contrast to all other studies, parents in their sample were mandated by the family courts to attend to the programme, which aimed to prevent maltreatment. The text message intervention was selected due to success observed in health care settings. In the intervention condition, participants received text message reminders each week, reminding them of the place and time of each session. The effect of text messaging was tested using a randomised controlled trial with control participants receiving no text messages. Those consenting to take part in the research received a $10 gift card. The main outcome variables were: the number of sessions attended, attendance at make-up sessions (for missed main sessions) and completion (attendance at all sessions). No differences were observed between groups for the number of sessions attended or attendance at make-up sessions. But completion (%

families attending all sessions) was significantly higher in the intervention group. Therefore, text message reminders were akin to the results of some financial incentive studies which observed an effect for attendance/completion (Rodriguez et al., 2020, Diaz and Perez, 2009, Heinrichs, 2006), but contrasts with studies testing a manipulated recruitment strategy that failed to have an effect beyond initial enrolment (Abraczinskas et al., 2020, Winslow et al., 2016, Spoth and Redmond, 1994). However, it is not clear why text messages influenced programme 'completion' but had no effect on attendance.

Murray et al. (2015) used a robust study design, but like Winslow et al. (2016) only those agreeing to be part of the study as opposed to all families enrolled on the programme were randomised to receive the intervention or not. This potentially presents a risk of selection bias, as those willing to take part in the research may differ from those that did not. Moreover, as parents enrolled on the programme were mandated to attend by the family courts, this likely confounded motivations to attend. In addition, 95% of the sample reported high levels of stress at baseline which could also have influenced their motivation to engage. The sample size in this study was small, comprising just 117 participants, the smallest sample amongst studies using a randomised trial design. The power to detect an effect was not described and the authors reported that programme deliverer blinding was not possible which could have biased results. Therefore, as an isolated study, the evidence supporting text messages was inconclusive, even though it has showed promise in other areas.

2.4.1.6 Testimonial

Two studies were undertaken by Morawska et al. (2011) testing the effect of varying testimonials on engagement with a parenting programme. Study One was a three arm study which compared an expert (clinical psychologist) testimonial with a parent testimonial and no testimonial. Study Two tested a fear-based message testimonial with a non-fear message testimonial. Testimonials were viewed on a DVD prior to a promotional video describing the programme. Participants were then asked to complete a questionnaire on their response to the testimonial/promotional video. In contrast to the other studies, Morawska et al. (2011) did not measure actual engagement outcomes, but instead measured whether participants would be 'likely to enrol' (Study One) or whether they 'would like to try the parenting programme in the future' (Study Two).

In both studies undertaken by (Morawska et al., 2011), no effect was observed for any of the testimonial conditions. However, the rationale behind using this method was justified by the authors who explained that testimonials are widely used to support health promotion efforts, and that the evidence suggests they would be welcomed by parents to promote parenting programmes. Moreover, they proposed that social influences are known to influence programme participation and evidence is emerging about the potential of fear-based messages in the context of public health. Overall, the quality of reporting for both studies was low. Study One did not describe who the target population was, or how participants were recruited. Study Two described the sample as being recruited from a selection of primary schools in Australia but did not provide details of how many were involved, or their characteristics. No eligibility criteria were defined for participants, or the schools. Neither did the authors describe the setting in which either of the studies took place. Participant demographics were provided but showed the sample to be predominately married, white Australian, higher educated females who were unlikely to be representative of the target population. In addition, the authors described the majority of participants (97% in Study One and 72.6% in Study Two) as having had prior knowledge of the parenting programme which could have biased their responses to the testimonial/promotional video.

Although the quality of these two studies was inferior to the other studies, the results were comparable to Winslow et al. (2016) and to Abraczinskas et al. (2020), whose engagement package also comprised a testimonial component. Their overall package did promote intent to enrol, but Abraczinskas and colleagues' analyses of individual components indicated that the testimonial component had a significantly lower effect than the full package. Therefore, combined, results indicate that testimonials are unlikely to have a substantial impact, though this is difficult to confirm given the study limitations.

2.5 Discussion

The aim of this review was to provide a summary of interventions that were developed and evaluated with the aim of promoting engagement with a public health programme, to support the development of the HENRY participant engagement intervention. Despite the well reported problem of participant engagement with public health programmes, only 12 eligible studies were identified. Six types of engagement strategy were tested: monetary incentive, differing programme formats, prize draw incentive, manipulated recruitment strategies, text message reminders and testimonials. The engagement strategies

found to have some effect were monetary incentives, manipulated recruitment strategies and text message reminders. At the time of the development of the HENRY participant engagement intervention, some of these studies had not yet been published (Abraczinskas et al., 2020, Rodriguez et al., 2020, Winslow et al., 2016). However, conclusions drawn at the time were consistent with those described here.

Monetary incentives were found to promote initial engagement with parenting programmes, but less so attendance. These findings align with the wider literature around parenting programme engagement, whereby financial incentives may provide some benefit but that other factors are more likely to be influential. For example, in a recent study that did not use an experimental design and therefore was not included in the review, Gross and Bettencourt (2019) observed that financial incentives were less of a motivator to maintaining attendance than wanting to be a better parent and wishing to learn new parenting skills. Similarly, in a prospective study exploring engagement with community based prevention interventions in the US, it was reported that although potential participants were initially attracted by financial incentives, it was the motivation levels of participants that were a greater contributing factor to attendance (Guyll, 2003).. In the wider literature, several reviews have been undertaken to explore the effect of incentives on smoking cessation rates. As described in a Cochrane review (Notley, 2019), studies offering monetary incentives to promote cessation outcomes were more successful than those that did not, therefore offering any incentive is beneficial. Thus, it would stand to reason that monetary incentives would also be effective at motivating engagement.

Spoth and Redmond’s (1994) manipulated recruitment strategy addressed specific barriers to engagement including perceived lack of time and perceived need of the intervention. A similar approach was utilised by Shepard et al. (2012) who incorporated a pre-programme home visit to increase readiness and motivation to engage with a parenting programme. The authors reported that preliminary trends on enrolment and participation were promising but definitive trial data obtained from this work has not been published. Winslow et al.’s (2016) multi-component engagement package promoted enrolment when controlling for child behavioural problems. This finding was supported by Abraczinskas et al. (2020) in a wider sample but they did observe an effect for initiation and enrolment. However, none of these studies incorporated modifications to the actual programme, such as content or delivery style which could have been beneficial to maintaining engagement (Gonzales et al., 2016). Although

theoretically based, none of the studies described how their studies proposed to promote attendance, yet this was still a main outcome measure.

Text message reminders were found to be effective for promoting completion rates in the Murray et al., (2015) study. However, attendees had limited choice but to attend as this was a mandated programme resulting in high attendance in both arms. Text messages are often used in clinical settings to promote uptake of appointments or treatment and have been largely found to be effective (Robson et al., 2017, Uy, 2017, Dang et al., 2013, Weaver et al., 2015, Guy et al., 2012). They have also been found to be cost effective and are a low resource engagement strategy (Junod Perron et al., 2013). Therefore, this method could be feasible to implement on a large scale.

Testimonials were not found to be effective (Morawska et al., 2011, Abraczinskas et al., 2020), although the quality of reporting in one of the studies was low (Morawska et al., 2011). The use of testimonials or 'word of mouth' in recruitment efforts to promote public health programme participation is well supported in qualitative literature (Parry et al., 2019, Owens, 2007, Flores et al., 2015, Stahlschmidt et al., 2013, McCann et al., 2013, Matthews et al., 2012) as well as being inexpensive to implement (Byaruhanga et al., 2019). Therefore, they are acceptable and feasible but not necessarily effective.

2.5.1 Quality of the evidence

As described, strengths and limitations were identified in all the studies, influencing their internal or external validity. Nine of the 12 studies used randomisation to allocate experimental condition (Abraczinskas et al., 2020, Rodriguez et al., 2020, Winslow et al., 2016, Murray et al., 2015, Morawska et al., 2011, Gross et al., 2011, Diaz and Perez, 2009, Heinrichs, 2006, Hennrikus et al., 2002). Where reported, sample populations mainly appeared to be representative of the source population. However, just one study reported a sample size calculation, and the majority of studies were small in scale. Nine of the studies did not describe blinding procedures and three reported that blinding of either the assessor, programme deliverer or recruiter was not possible, presenting a risk of bias (Winslow et al., 2016, Murray et al., 2015, Heinrichs, 2006). Intention to treat analyses was presented in just three of the studies (Murray et al., 2015, Diaz and Perez, 2009, Hennrikus et al., 2002) and just five discussed and/or accounted for potential confounders (Abraczinskas et al., 2020, Winslow et al., 2016, Gross et al., 2011, Dumas et al., 2010, Heinrichs, 2006).

Some of the studies may have been confounded by selection bias (e.g. Gross et al., 2011, whose sample consisted of parents mandated to attend a parenting programme). Selection bias is often unavoidable, but Abraczinskas et al. (2020) may have minimised this by using a 'real world' design. This involved promotion and delivery of the programme taking place within existing service delivery to mimic real-world implementation so as not to influence participant behaviour.

The engagement outcomes measured in each study varied greatly, making synthesis of the data difficult. Some outcomes were poorly defined, for example, Hennrikus et al. (2002), whose main primary outcome measure was 'participation' and yet only 'registrations' were reported. Others confounded engagement outcome with research objectives (e.g., Heinrichs (2006)) who defined 'completers' as attending at least one programme session and follow up assessment. This prevented the main objective of the intervention being disentangled from the research study evaluating it. Finally, many studies reported multiple outcome measures with no defined primary outcome. This could be indicative of reporting bias, where authors select multiple outcomes of interest to better reflect the results of the intervention.

2.5.2 Completeness and applicability of the findings

Although none of the studies were undertaken in the UK or sought to promote engagement with an obesity prevention programme, all but two of the studies (Emont and Cummings, 1992, Hennrikus et al., 2002) aimed to promote engagement with a parenting/family based programme. Therefore, the outcomes of these studies were potentially transferrable to the HENRY participant engagement intervention. Many of the interventions were also aimed at families living in disadvantaged areas, which are known to be the least likely to engage in public health programmes but which could benefit from HENRY, and where children's centres are predominately located (Dumka et al., 1997, Eisner and Meidert, 2011). None of the studies were undertaken in children's centres. Six however, were undertaken in a community-based early years environment (day care or preschool setting) (Rodriguez et al., 2020, Gross et al., 2011, Dumas et al., 2010, Heinrichs, 2006), where families may have been familiar with the setting and had established relationships with staff promoting and delivering the programme, which is similar to that of the HENRY delivery model.

The applicability of the two smoking cessation programmes was less clear, as motivations for engaging were likely to have differed. For example, motivation to attend a smoking cessation clinic may be driven by fear of negative health effects (Farrelly et al., 2012), whereas potential participants of other public health programmes may not perceive the need for an intervention, thus reducing motivations to attend (Becker et al., 2002). Conversely, some smoking cessation programmes use a family-based approach, by setting cessation goals to benefit the whole family (Rosen, 2012), but this was not described in the identified studies.

Overall, the literature review provided a narrow body of evidence with just two types of public health programmes being studied. Engagement strategies tended to focus on incentivising or attracting parents to the programmes but did not address specific barriers to engagement. None of the studies considered factors influencing engagement beyond the participant level. Participant level factors rely on individual behaviour change and do not account for wider determinants of engagement, such as programme acceptability, promotional strategies and accessibility (Love et al., 2018, La Placa and Corlyon, 2014). Most studies selected their engagement strategy according to the method already being widely used, despite a lack of proven effectiveness (Dumas et al., 2010, Diaz and Perez, 2009, Heinrichs et al., 2006, Hennrikus et al., 2002, Emont and Cummings, 1992). Many identified interventions also lacked a theoretical underpinning, yet interventions underpinned by a theoretical approach are most likely to work as proposed mechanisms of change are better understood (Craig et al., 2006). This could explain why effects of the interventions were on the whole weak. Three studies based their engagement strategy on behavioural theory. However as described, clear relationships between intervention components and their proposed engagement outcomes were not described (Abraczinskas et al., 2020, Winslow et al., 2016, Spoth and Redmond, 1994). The absence of a logic model could explain why many of the studies measured multiple outcome measures due to a lack of understanding as to how the interventions were proposed to work. Only one of the studies described a process evaluation component, providing reasons for non-engagement (Emont and Cummings, 1992). Not undertaking a process evaluation alongside and effectiveness evaluation prevents lessons being learnt about why an intervention does or does not work.

In summary, the studies identified in the review were of great relevance to the HENRY participant engagement. Monetary incentives, manipulated recruitment strategies and text messages were revealed to have some effect on engagement and were therefore considered for use in the participant engagement intervention (see Chapter Four). This review was also useful for emphasising areas to be considered outside of particular strategies. In particular, the importance of addressing specific barriers to engagement, developing strategies to promote both enrolment and attendance, clearly setting out how the intervention was expected to work (i.e., by developing a clear logic model) and undertaking a process evaluation.

2.5.3 Strengths and limitations of review

This literature review was conducted in a systematic way, using five databases which yielded 7227 papers. Of which, just 12 were eligible. As a systematic review method was not adopted, a second reviewer did not screen papers for eligibility. However, the inclusion and exclusion criteria were clearly defined. Bibliography searches were not undertaken which could have led to some articles being missed, but the approach taken did result in all papers being described despite the quality of evidence.

The majority of titles identified that were deemed not relevant or ineligible were interventions aimed at promoting uptake of screening appointments or compliance/attendance at clinical treatment programmes. It is not known whether some learning from these studies could have been gained, but the motivations for attending treatment programmes along with the target population are likely to have differed. Moreover, many of these clinical studies aimed to promote uptake of single appointments rather than participants being required to commit to a larger programme. Other ineligible papers included descriptive papers that described predictors to engagement or described an engagement intervention, but did not evaluate its effect. In order to move the literature forward in this field, researchers need to evaluate their engagement efforts so that their impact can be understood. The review's focus on engagement interventions as opposed to exploring broader learning from evaluation studies also likely limited the scope of the papers retrieved. The rationale for this was that motivations for engaging with public health programmes in a real world setting may be confounded in an evaluation study. But, as observed in the review, most of the studies evaluating an engagement intervention involved participant's actively engaging in research, highlighting that real-world research is not always feasible.

2.5.4 Implications for practice

There is a wealth of literature describing barriers and predictors to engagement with public health programmes. But, as demonstrated here, few have formally tested the effect of an engagement strategy. This should be prioritised in public health research in order to optimise the implementation of programmes, thus promoting their impact, value for money and sustainability.

None of the interventions tested here were able to promote engagement with all measured outcomes, with the majority of effective interventions successfully promoting enrolment/initiation but not attendance. Evidence suggests that local authority commissioners value retention over enrolment (Webb et al., 2020). Therefore, researchers should consider multiple strategies aimed at promoting engagement at various stages.

Engagement outcomes may be improved if prior research is undertaken to determine specific barriers and levers to engagement within a programme's context (Bartholomew, 2006, Michie et al., 2011), rather than interventions being selected due to their existing wide use, even where empirical evidence is lacking. Moreover, utilising theory to inform the design of an intervention could offer a better chance of success (Craig et al., 2006). Process evaluation should also be undertaken to identify *why* interventions do or do not work. Further, in order for the results of engagement interventions to be synthesised, studies should aim to adopt consistent language and clearly define engagement outcome measures. Engagement outcomes should also be clearly distinguishable from research objectives. Finally, researchers should evaluate engagement interventions using a robust design. Where possible, studies should be undertaken in a real world setting so that findings can be generalised and readily adopted (Patient-Centered Outcomes Research Institute, 2018). Reducing participant burden (e.g., via use of routinely collected data) may also reduce the risk of selection bias (Cheung et al., 2017).

2.6 Conclusion

This review identified six types of engagement intervention that have been developed and evaluated with the aim of promoting engagement with a public health programme. None of the interventions demonstrated success at promoting all stages of engagement, though monetary incentives, manipulated recruitment strategies and text message reminders did achieve some success at promoting enrolment or attendance. Study limitations prevented confirmation of their effect, but these engagement strategies were considered in the design of the participant

engagement intervention. The findings of the review highlighted a lack of studies testing an engagement intervention aimed at promoting engagement with an obesity prevention programme. There was also a lack of programmes undertaken within a UK setting or a children's centre environment, confirming a gap in the evidence.

Chapter Three: Focused Ethnography Study

3.1 Introduction

3.1.1 Overview of chapter

The previous chapter described a literature review that was undertaken to identify effective interventions for promoting engagement with public health programmes. The review highlighted a lack of interventions demonstrating effectiveness and that few were aimed at addressing specific barriers and levers to engagement. This chapter describes the first study undertaken in the thesis; a focused ethnography study that took place in children's centres that delivered HENRY programmes. This study aimed to explore barriers and levers to engagement that were specific to the children's centre context and target population to inform the development of the HENRY participant engagement intervention.

The study described in this chapter was published in a peer reviewed journal:

Citation: Burton, W., Twiddy, M., Sahota, P. et al. Participant engagement with a UK community-based preschool childhood obesity prevention programme: a focused ethnography study. BMC Public Health 19, 1074 (2019). https://doi.org/10.1186/s12889-019-7410-0

3.1.2 An introduction to ethnography

Ethnography originated in the nineteenth century and has its roots in anthropology, sociology and the study of Native American cultures (O'Reilly, 2012). It arose gradually as a means to describe and experience cultures first hand as opposed to relying on secondary resources. Ethnographical research involves the researcher immersing themselves within the culture of study to understand experiences as they are lived in 'real-time' by listening, watching and asking questions (O'Reilly, 2012). This research method differs from other social research methods, as the researcher is obliged to not only report the facts, but attach meaning and interpretations to the findings to translate them to a wider context (Gobo, 2008). Ethnographical fieldwork predominately comprises participant observation where the researcher becomes involved in daily activities to personally experience and share in everyday life (Hammersley and Atkinson, 2007). This allows participants to be comfortable in the researcher's presence, but the researcher must balance 'insider' and 'outsider' status to maintain professional distance (Brewer, 2000). This method differs from non-participant observation where researchers take a 'fly on the wall approach'; watching and listening to actions and events as they unfold. This can enable structured and objective data collection, but observers need to be mindful of the 'observer effect', when the researcher influences participant's actions (Lui and Maitlis, 2010). Traditional ethnography typically involves fieldwork taking place over a long duration, with a broad and undefined area of study (Morse and Richards, 2002). However, due to funding and time restraints typically experienced in health research this method is not always feasible.

One adaptation of traditional ethnography is 'focused ethnography', which uses a targeted approach to explore a specific research problem within a specific context (Morse, 1987). This method involves drawing on available literature and theory to develop a clear and focused research agenda. Field work visits are undertaken at specified sites, where participants are knowledgeable around the research topic and are scheduled according to project timeframes. A second observer can also be used as a further resource, and wider research teams are involved in interpreting data to provide a heightened perspective (Higginbottom et al., 2013).

A focused ethnographical approach was applied in the current study to enable an in-depth exploration of the children's centre culture, political environment and daily practices whilst also being consistent with time and funding expectations. The approach also allowed for the existing literature to be drawn upon to inform potential areas of investigation and to guide the data analysis and interpretation.

Although ethnography can be described as a research method, ethnography itself is also a methodological approach. The methodology of ethnography fits within both positivistic and naturalistic theoretical models of social research (Atkinson and Hammersley, 1998). Positivism believes that the social world is 'knowable', independent from individuals' interpretation of it. Naturalism on the other hand does not view the social world as reducible. Thus, it cannot be externally observed, rather, researchers must access the individuals within it to obtain their accounts and beliefs (Brewer, 2000). Ethnography also draws upon mixed ontological assumptions. It accepts that there is a social reality that is independent of an individuals' interpretation of it, yet also accepts that individuals within that world may view their world differently (Brewer, 2000). Epistemological assumptions can also differ. Some view the best way of understanding a social reality as remaining separate from it, using an objective and investigative approach. Others, however, seek to become part of the social world to become part of the lived reality (Whitehead, 2002). Focused ethnography in particular draws upon all of these positions. This method uses standardised and deductive methods to strengthen scientific rigour and narrow the focus of research. But, consistent with traditional ethnography, the researcher still aims to become immersed in the setting to attach their own meaning and interpretation to findings. Some question the methodological foundation of focused ethnography due to the limited time given for researchers to become immersed within the setting, along with the limitations in scope (Muecke, 1994). Yet, others argue that time spent in the field is substituted by higher intensity data collection which bridges the gap between traditional ethnography and other methods that are employed to address practical problems (Wall, 2015).

3.1.3 Theoretical approach

The theoretical approach used in the study was based on the available evidence of factors influencing parent engagement with public health programmes, and the literature on contextual factors that influence the implementation of programmes.

3.1.3.1 Parent engagement with parenting programmes

As this study aimed to identify barriers and levers to parent engagement with HENRY, the literature was explored to understand factors that influenced engagement with similar programmes, to provide a starting point for the investigation. During initial scoping of the literature, a qualitative systematic review was found that synthesised the literature on why parents did or did not choose to commence or complete parenting programmes. Perceptions of the parents and practitioners were also compared (Mytton et al., 2014). From the review, six facilitators and five barriers to parent engagement were identified (Table 3.1). Results were similar between parents and practitioners, but there were nuances in what they found to be important facilitators or barriers. For example, although both groups reported that the group facilitator was important for maintaining engagement, parents valued knowing and trusting the facilitator, whereas practitioners felt that skills and training were important. This emphasised the need to explore barriers and levers to engagement from a number of perspectives.

Before using the Mytton et al. (2014) paper to guide the ethnography study, quality of the review was assessed using guidance on how to undertake a qualitative systematic review (Booth et al., 2016). As the aim, research question, methods and inclusion criteria were clearly justified and described, and included the use of a validated risk of bias quality assessment tool, it was deemed to be good quality. However, the search strategy used in the review was specific rather than sensitive, aiming to identify studies that described engagement with just one type of parenting programme (programmes aimed at supporting the development of the parent and child relationship) as opposed to *any* public health programme delivered to parents. This limited its use for informing potential barriers and levers to engagement with an obesity prevention programme (i.e., HENRY) which does not focus on developing the parent and child relationship. Many of the identified papers included in the review also included studies undertaken in specific population groups (e.g., parents of children with disabilities) making the findings less representative of the general population. Broadly speaking however, the findings were relevant to the ethnography study and reported

barriers and levers were likely to be applicable to the HENRY target population. Nonetheless, the themes identified in the review were not exhaustive, therefore, barriers and levers outside of these themes were also explored.

Table 3.1 Facilitators and barriers to parent engagement with parenting programmes (Mytton et al., 2014)

Facilitators to engagement	
Behaviour change	Learning new skills during sessions
Role of deliverer	Using trusted or known people to recruit to and deliver programmes
Group experience	Meeting others, exchanging ideas and receiving support from peers
Focused message	The flexibility of the programme to meet the needs of participants
Accessibility	The time and place of the programme being accessible to participants
Incentives	Providing incentives such as vouchers, free meals and travel expenses
Barriers to engagement	
Behavioural barriers	Difficulties in changing behaviour
Programme delivery constraints	Didactic style of delivery and lack of focus
Participant constraints	Competing demands, fear of groups, practical issues
Complex interventions	Too many programme objectives makes the programme too complex
Social and cultural barriers	Participant lifestyles, and socioeconomic, ethnic, language and literacy barriers

3.1.3.2 Implementation factors influencing engagement

To understand the contextual factors influencing implementation of HENRY (e.g., organisational, economic, political, social, behavioural and programme level factors) an implementation determinant framework was used to structure the research. Implementation determinant frameworks describe the factors proposed to influence implementation outcomes such as engagement (Nilsen, 2015). Three prominent implementation determinant frameworks from the literature were considered for use that were most suited for meeting the aims of the study: The Promoting Action Research on Implementation in Health Services (PARiHS) framework (Kitson et al., 1998), the Practical, Robust Implementation and Sustainability Model (PRISM) (Feldstein and Glasgow, 2008) and the

Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009). Other frameworks that were considered but did not meet the aims of the study. These included the Theoretical Domains Framework (Michie et al., 2005) which focuses on barriers and levers to implementation at the individual rather than organisational level and The Ecological Model which gives most attention to features of the intervention (Durlak and DuPre, 2008) as opposed to context.

The Promoting Action on Research Implementation in Health Services (PARiHS) (Kitson et al., 1998)

The Promoting Action on Research Implementation in Health Services (PARiHS) framework proposes that successful implementation of an intervention relies on: the nature of available evidence supporting the intervention, the context in which the intervention is to be implemented, and facilitation of the intervention whereby individuals within an intervention setting support and lead implementation efforts (Table 3.2). Use of the framework involves considering whether factors within the constructs can be considered as 'high' or 'low' in position on a sliding scale of factors influencing implementation outcomes (Figure 3.1). For example, within the sub-construct of 'research', randomised controlled trials may be classed as 'high' in positions whereas anecdotal evidence could be classed as 'low' in position.

Table 3.*2* PARiHS constructs and sub constructs

Construct	Sub construct
Evidence	Research Clinical experience Patient preference
Context	Culture Leadership Measurement
Facilitation	Characteristics Role Style

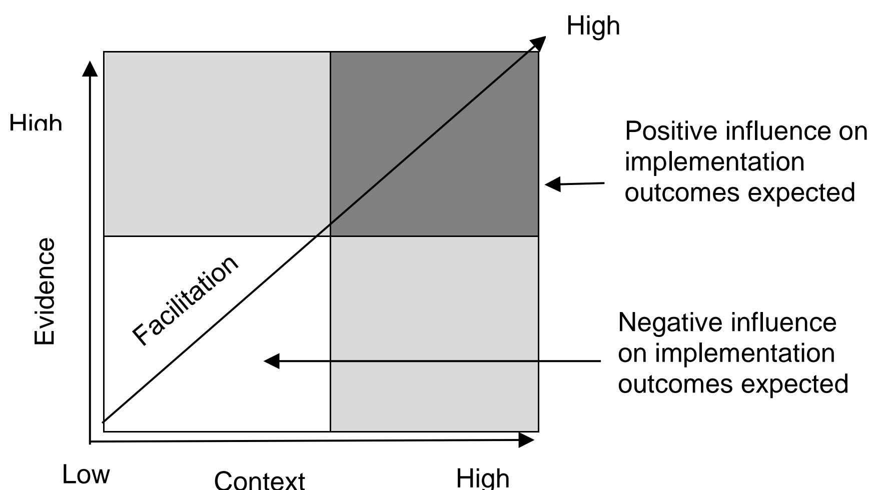


Figure 3.1 Matrix in which evidence, context and facilitation can either be expected to influence implementation outcomes in a negative or positive way (Kitson et al., 1998)

The PARiHS framework successfully conceptualises how individual elements of programme implementation are likely to lead to positive or negative implementation outcomes. Considering whether individual factors may be viewed as high or low in position is intuitive and logical to apply and is consistent with considering whether factors act as a barrier or lever to implementation. However, the number of potential determinants is low, and not likely to be representative of all factors that could influence implementation. For example, the construct of 'context' does not include well reported barriers to implementation such as a lack of time and resources. The term 'culture' is also broad which could make it difficult to apply as an area of exploration. Since its publication, the framework has also been criticised in the literature for its lack of depth and poor clarification of its theoretical underpinning (Helfrich et al., 2010). In response, a revised framework was proposed (Harvey and Kitson, 2016) which expanded the number of constructs and sub constructs, and importantly, recognised that wider contextual factors such as social, political, policy and economic factors should be areas of research. This updated framework was successfully utilised by Wilcox et al. (2020) to identify barriers and levers to implementing a workplace quality improvement intervention. However, the revised framework was published after the current study and was therefore not considered for use.

The Practical, Robust Implementation and Sustainability Model (PRISM) (Feldstein and Glasgow, 2008)

The Practical, Robust Implementation and Sustainability Model (PRISM) was developed to expand upon the RE-AIM (reach, effectiveness, adoption, implementation and maintenance) framework which was designed to support the translation of research into practice by promoting the assessment and reporting of these constructs in evaluation studies (Glasgow et al., 1999). The PRISM model serves as framework for implementation research by specifying determinants that are likely to influence implementation outcomes (McCreight et al., 2019). The model proposes that: characteristics of an intervention, recipients, external factors and implementation infrastructure all feed into the achievement of RE-AIM outcomes (Figure 3.2).

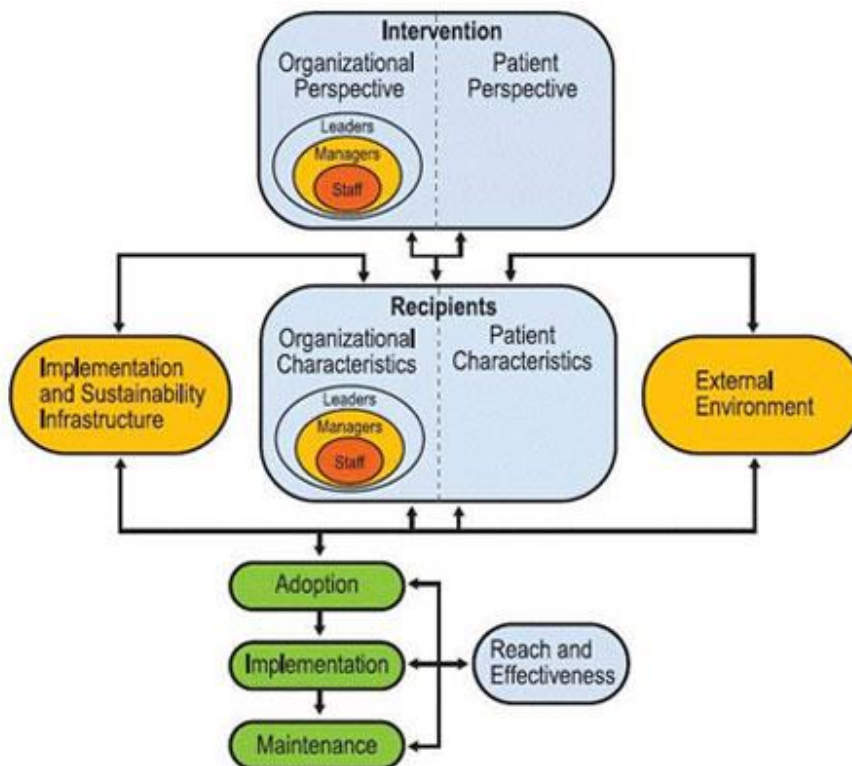


Figure 3.2 Practical, Robust Implementation and Sustainability Model (Feldstein and Glasgow, 2008)

As a framework, the PRISM model provides a comprehensive view of factors influencing implementation. It also clearly hypothesises how these factors influence one another and lead to intervention outcomes. A further strength of the model is the consideration of the end-user or ‘patient’ which is not considered in the PARiHS framework. In the literature, the model has been successfully

used to understand the barriers and levers to implementing programmes in a wide range of settings. For example, Van Deinse et al. (2020) used the framework to provide a comprehensive exploration of the implementation of mental health services in the US criminal justice system, whilst Schölin and Fitzgerald (2019) used the framework to explore implementation of a programme in UK antenatal care. However, it is not clear how the model could be used as a framework beyond studies seeking to explore full implementation pathways. For example, there is no indication of how the model could be broken down to focus on specific implementation problems, or whether proposed relationships and pathways would still apply. This limitation was relevant to the ethnography study as the research sought to understand parent engagement or 'reach' of HENRY, yet the model did not illustrate how constructs other than 'adoption', 'implementation' and 'maintenance' might interact with this. Therefore, it was not clear how this framework could be applied to aid interpretation of the results.

The Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009)

Damschroder et al. (2009) developed the consolidated framework for implementation research to bring together the wealth of existing implementation theories, models and frameworks, and provide consistent terminology and definitions of factors influencing implementation. The framework consists of five domains; intervention, inner setting, outer setting, characteristics of individuals and process. Each domain has a number of constructs (Table 3.3). The framework does not hypothesise interrelationship or ecological levels or propose 'what works'. Rather, it prompts researchers to consider the relevant implementation constructs and assess whether they act as a negative or positive influence on implementation. This framework also provides links to associated implementation theory if a more in-depth understanding of a construct is sought.

Table 3.3 Consolidated for Implementation Research Domains and Constructs

	Domain		Constructs
i)	Intervention Characteristics	A	Intervention source
		B	Evidence strength and quality
		C	Relative advantage
		D	Adaptability
		E	Trialability
		F	Complexity
		G	Design quality and packaging
		H	Cost
ii)	Outer Setting	A	Patient needs and resources
		B	Cosmopolitanism
		C	Peer pressure
		D	External Policies and Incentives
iii)	Inner Setting	A	Structural characteristics
		B	Network and Communications
		C	Culture
		D	Implementation climate
		D.1	Tension for change
		D.2	Compatibility
		D.3	Relative priority
		D.4	Organisational incentives and reward
		D.5	Goals and feedback
		D.6	Learning climate
		E	Readiness for implementation
		E.1	Leadership engagement
		E.2	Available resources
		E.3	Access to knowledge and information
iv)	Characteristics of Individuals	A	Knowledge and beliefs about the intervention
		B	Self-efficacy
		C	Individual stage of change
		D	Individual identification with organisation
		E	Other personal attributes
v)	Process	A	Planning
		B	Engaging
		B.1	Opinion leaders
		B.2	Formally appointed implementation leaders
		B.3	Champions

		B.4	External change agents
		C	Executing
		D	Reflecting and evaluating

The principles of using the CFIR framework are similar to that of PARIHS, whereby each implementation construct is considered in terms of its positive or negative effect on implementation. The framework is also easy to apply to studies seeking answers on a specific implementation problem, as there are there are no pre-determined hypotheses regarding how each construct may interact with one another. In the literature, versatility of the framework has been demonstrated in examples such as Beckers et al. (2019), who explored barriers to recruiting children with cerebral palsy to a trial testing an intervention promoting independence, and Wagner et al. (2019) who undertook a study exploring the motivating factors of general practitioners to engage in a quality and feedback programme. Therefore it was likely that the framework could be applied to explore engagement with HENRY.

At the time of the study design, the CFIR framework was deemed the most appropriate for the ethnography study as it incorporated the strengths of both the PARiHS and PRISM framework in terms of intuitive use and the wide range of factors explored, with few limitations. The main limitation being the absence of the patient perspective, or in this study the ‘parent’ perspective. This was alleviated by use of the parent engagement literature as described above.

3.1.4 Specific study aims and objectives

As previously described, the focused ethnography study aimed to explore barriers and levers to parent engagement with HENRY within the children’s centre context to inform the development of a participant engagement intervention. Objectives of the study were to:

1) Explore barriers and levers to parent engagement with HENRY using the consolidated framework for implementation research and the literature on parent engagement to guide data collection and analysis.
2) Recommend potential behaviours to be targeted in the participant engagement intervention to promote engagement with HENRY.

3.2 Methods

The focused ethnography study was undertaken in five children's centres that delivered HENRY programmes and combined ethnographical observations, stakeholder interviews, parent focus groups and informal discussions. Ethical approval was obtained from the University of Leeds, School of Medicine Research Ethics Committee (MREC15-017) prior to undertaking the research.

3.2.1 Children's centre sampling

3.2.3.1 Positive deviance approach

The sampling method sought to identify centres that excelled in parent engagement and those that struggled to engage parents. Identifying centres that excelled in parent engagement was proposed in order to identify practices and behaviours that were favourable for parent engagement and to encourage these to be adopted by other centres. This method is termed positive deviance modelling (Bradley et al., 2009). The positive deviance approach originated in the 1970s by policy developers testing the concept that individuals living in a community that have a greater health status than others are likely to adopt different approaches to health that are beneficial (Marsh et al., 2004). Hence, these approaches are likely to be affordable, acceptable and sustainable because they are already being practiced (Marsh and Schroeder, 2002).

3.2.3.2 Positive deviant categorisation

The criteria used to categorise centres as excelling at engaging parents with HENRY ('positive deviants') was based on a centre's historical performance of meeting key engagement outcomes. The engagement outcomes used in this study were agreed between the wider study team and HENRY central office. HENRY central office recommend that centres should aim to enrol a minimum of eight parents per programme to promote strong group dynamics and make best use of resources. HENRY also recommend that, in order for parents to receive an adequate 'dose' of HENRY, they should attend at least five out of the eight sessions. Parent behaviour change as a result of attending HENRY, which served as a proxy for compliance, was included in the categorisation and assessed by measuring changes in child consumption of fruit and vegetables from the start to the end of the programme. Since the literature suggests it is harder to engage parents living in areas of high deprivation (Spoth and Redmond, 2000, La Placa and Corlyon, 2014, Whelan et al., 2018), deprivation rates within the locality of the children's centre were also considered within the positive deviant categorisation. This was to allow valuable lessons to be learned

from centres that performed well at engaging families despite being located in areas of high deprivation. Deprivation levels were estimated using the Index of Multiple Deprivation (IMD) scores (http://tools.npeu.ox.ac.uk/imd/). This tool places postcodes within quintiles of deprivation. Quintile one and two are classed as high deprivation and four and five are classed as low deprivation.

Specifically, children's centres were categorised as positive deviants if they: recruited at least eight parents to their most recent HENRY programme, at least 75% of parents 'completed' the programme, the average consumption of child fruit and vegetable was increased by 0.5 portions from the start to the end of the programme, and the centre was located in an area of high deprivation (IMD quintile one or two). Low engagers were defined as centres that did not meet these targets and were located in areas with low deprivation levels (IMD quintile of four or five).

Within the positive deviant and low engager children's centre categorisation, criteria were not included in relation to children's centre engagement levels with different groups of parents (e.g., ethnic groups). Children's centres are located in the most deprived areas of the country which are often populated by minority ethnic families (Bell et al. 2004). Children's centres often tailor services appropriately to facilitate engagement, including language courses, outreach works and the provision of interpreters. As such, evidence suggests that minority ethnic parents are keen to engage with local services and programmes offered by centres. (Parks, 2015, Page and Whitting, 2007). Indeed, routine process data indicate that the HENRY programmes often attract families from a range of ethnic backgrounds (Howlett et al., 2021). Conversely, the same data highlight a lack of involvement of fathers, which is consistent with the service wide issue of family services failing to engage with fathers (Potter and Carpenter, 2008, Evangelou et al., 2014). As promoting engagement with fathers was not a specific aim of the study, this was also not considered in the positive deviant/low engager categorisation. However, the ethnography study did aim to explore all positive or negative engagement behaviours across all centres in the sample, which included efforts to engage a range of participants on to HENRY programmes.

3.2.3.3 Identification of positive deviants and low engagers

HENRY central office routinely compile data on centre level enrolment, attendance and behaviour change from each HENRY programme that is delivered. The data from the most recent HENRY programme for each children's

centre were securely transferred to the University of Leeds. Postcodes for each centre were also provided. Analysis of these data to identify positive deviants and low engagers was undertaken by Dr Bryant (PhD supervisor) within the wider programme of work (see Chapter One; Figure 1.1). Data were available from 144 children's centres, of which 13 were categorised as positive deviants and four as low engagers.

3.2.2 Participants, recruitment and consent

3.2.2.1 Participants, recruitment and consent: Children's centres

Identified positive deviants (n=13) and low engagers (n=4) were invited to take part in the study if they planned to deliver a programme during the scheduled fieldwork (July-December 2015). This was so that HENRY promotional activities or the delivery of HENRY programmes could be observed during ethnographic fieldwork at the centre. Centres were not informed of whether they were classified as a positive deviant or low engaging centre. The identification of centres that planned to deliver a programme during this time was established via communications between HENRY central office and local authority HENRY coordinators that were responsible for coordinating HENRY activities in their local area. This revealed that just two positive deviants and two low engagers planned to deliver a programme during the study period. However, the study timeframe allowed for five centres to be visited. Therefore, another centre was identified that was deemed a 'moderate' engager, since it met three out of the four positive deviant criteria (an enrolment of at least eight parents on their most recent programme, an increase of more than 0.5 portions of fruit and vegetables, was located in an area placed within the 4th quintile of deprivation) and had a programme planned during the study.

In order to invite centres to take part, HENRY central office made initial contact with respective HENRY coordinators. The HENRY coordinator then informed the children's centre managers about the study. All of the centres approached by their coordinator were happy to take part and subsequently provided consent for the research. Approval was also provided by the local authority before any fieldwork visits took place.

All staff working within the centres were informed that a researcher would be spending time at the centres, and that observations would be taking place during that time. Parents visiting the centre were made aware of the researcher presence and potential observations by notices placed within the children's centre reception areas. Staff and parents were encouraged to advise the

researcher or a member of staff if they did not wish to be included in the observation. At the start of all observed group sessions, the PhD candidate was introduced and people again given the opportunity to opt out of being observed if they wished.

3.2.2.3 Participants, recruitment and consent: Interview participants

An interview sampling frame was developed to ensure diversity of views so as to represent each level of the managerial hierarchy. Therefore, the sample included: local authority commissioners of HENRY, local authority HENRY coordinators, children's centre managers, HENRY facilitators and members of children's centre staff that were not trained in the HENRY approach. All stakeholders attached to participating centres were eligible to take part in interviews if they were employed within one of those roles. Some interviewees (i.e., commissioners, coordinators and managers) were invited directly by the PhD candidate via email during study set-up. HENRY facilitators and children's centre staff were selected and invited to be interviewed by their respective manager. Written informed consent was received before each interview took place.

3.2.2.4 Participants, recruitment and consent: Focus group participants

Focus groups were held in each centre with parents that had previously attended a HENRY programme. Any parent that had attended a programme was eligible to take part. In order to recruit focus group participants, posters were displayed within each centre prior to and during the research, inviting previous participants of HENRY to take part, including those that had dropped out of the programme. Where uptake was low, children's centre managers were asked to contact previous participants via telephone to invite them to attend, irrespective of whether they had completed the programme. All participants provided informed written consent prior to the focus groups starting.

3.2.3 Data collection

Each centre was visited for five working days (25 days in total) within the opening hours of the centre (9am-4pm). At the start of each visit, a meeting was held with the centre manager to agree a study schedule (e.g., arranging when interviews and focus groups would be held) and to select specific sessions to observe. Confidentiality and safeguarding procedures were also agreed.

3.2.3.1 Data collection: ethnographical observations

Ethnographical observations were carried out by the PhD candidate in all five children's centres. One PhD supervisor (MB) was also present at the first visit to act as a second observer, to test the robustness of the observational approach. Observations took place of group sessions that were being delivered (e.g., 'play and learn' and parenting programmes, including HENRY). In addition, time was spent in communal areas of the centre (e.g., staff rooms and reception) to observe routine activity. During observations, a participatory approach was used, whereby the researcher sought to be part of the group (Lipson, 1994). Informal relationships were developed with staff and parents visiting the centre to allow them to feel open and relaxed, which facilitated informal conversations. Where permitted, policy documentation was reviewed in each centre, to understand the working culture and practices. The physical context was also observed, including promotional displays in the centre and the surrounding neighbourhood.

A CFIR observation template was developed and used to guide the observations which detailed each potential construct on which to map the observation (Appendix 1). This tool was used and completed out of sight periodically throughout the day. During the first visits, where the second observer was present, a meeting was held at the end of each day to discuss observations and agree which CFIR construct the observed actions and behaviours were consistent with. This ensured consistent use of the tool to strengthen validity of the findings. In depth field notes were completed at the end of each day after the visit had ended. This included details on what was observed, when and who was involved. Initial thoughts on key concepts and questions for future investigation were also noted, along with reflections on research practice and what was observed.

3.2.3.2 Data collection: interviews and focus groups

Interviews were held within the participant's place of work (i.e., local authority offices or children's centre). All interviews were undertaken by the PhD candidate and lasted between 60-90 minutes. Interview topic guides were informed by relevant CFIR constructs (e.g. knowledge and beliefs about HENRY and perceived quality of the evidence base surrounding HENRY). General questions were also included around potential barriers or levers to parent engagement (See topic guide, Appendix 2).

Focus groups were held within the children's centres. All focus groups were undertaken by the PhD candidate and two were supported by one PhD

supervisor (MB). Each focus group lasted between 30-60 minutes. Focus group discussions included questions on how parents were approached to attend the programme and what their perceptions were of HENRY. Questions also addressed barriers and levers to engagement identified by the Mytton et al. (2014) review, for instance, the role of facilitator in engagement (Appendix 3).

After the focus groups and interviews, notes were recorded about any external factors which may have influenced responses, such as whether interview participants seemed pressed for time and how this might have influenced their response. Interviews and focus groups were audio recorded using a Dictaphone. Recordings were transferred onto an encrypted laptop when possible and deleted from the Dictaphone.

3.2.4 Data analysis

After each children's centre visit, field notes and transcripts were imported onto NVivo (Version 10) data analysis software (QSR International Pty Ltd, 2014), where they were organised into case folders. A deductive framework method was applied to analyse the data using the consolidated framework for implementation research. Framework analysis is widely used in health research that has a specific research question, limited time frame and defined sample (Ritchie and Spencer, 1994). The method allows data to be interrogated using concepts developed *a priori* which are informed by the literature, theory and research question. A list of data labels or 'codes' is developed in advance of the analysis. A matrix is then produced where participant groups are used as column headers and rows are labelled according to theme. Coded sections of data or data summaries are then placed within the framework. This method allows data to be compared between and within participant groups quickly and transparently. In this instance, the 39 constructs within the CFIR framework were used to inform the *a priori* list of codes (Appendix 4). Barriers and levers to engagement identified by Mytton et al. (2014) were also added to the list. Data from ethnographic observations, interview and focus groups were mapped to each code for every participant group to form the matrix (Table 3.4). All data were coded by the PhD candidate and a sub sample (10%) second coded by Twiddy, M. (PhD supervisor) to ensure consistent use of the code list. A matrix was developed for each centre and presented to the wider research team to agree on key issues influencing engagement. Centre matrices were then combined to produce and overall matrix summarising the key concepts to highlight divergence in views and experiences between and within participant groups.

Table 3.4: Extract of matrix presenting data from each participant group against theme (see results section for full table)

Theme	Commissioner	Manager	HENRY coordinator	Staff	Parents	Ethnographer observations
CFIR domain: Inner setting						
Access to knowledge and information	Two commissioners have detailed understanding of what HENRY entails, but three only have a brief understanding. Varying views between commissioners on whether all children's centre staff should receive core training.	All but one manager have limited knowledge of what HENRY actually entails. All but one manager only provide HENRY core training to staff that will ultimately deliver the programme.	Two commissioners believe passionately that all staff should receive core training, but three don't see it as needed (e.g. in one centre HENRY is delivered externally) or don't view it as practical due to cost/capacity.	Untrained HENRY staff have varying knowledge of what HENRY entails, some believe a lack of knowledge hinders their ability to accurately promote the programme and would like to receive training but not able to due to cost/capacity issues.	Most parents say they received limited information on HENRY before they attended. Most believed it to be a cooking or healthy eating course or to help with 'fussy eating'.	General understanding of the details around what HENRY entails is low among commissioners, managers and untrained staff in three of the centres, irrespective of whether they are positive deviant or low engaging centres. But where HENRY is more embedded (i.e. in two centres) all stakeholders appear 'bought-in' and knowledgeable. Staff appear to promote HENRY by predicting what will appeal to the parent e.g. a 'fussy eating course' or a 'weaning course' both of which are inaccurate.

3.3 Results

3.3.1 Sample

Table 3.5 describes characteristics of the children's centres included in the study, which took place between July and November 2015. During the research, 190 hours of ethnographic observation were undertaken along with six focus groups, attended by 36 parents and 22 interviews with children's centre stakeholders (Table 3.6). No participants opted out of being observed during the fieldwork. All focus group attendees were recruited through their respective children's centre managers as there was no response to recruitment posters. Therefore, an opportunity sampling method was adopted (Jupp, 2006). All but one focus group attendee had completed a HENRY programme (at least five of the eight sessions). The selection process used to identify potential focus group participants was not disclosed by the managers. As previously described, centre managers also selected HENRY facilitators and members of staff to be interviewed, but did not disclose reasons why specific interviewees were approached.

Table 3.5 Children's Centre Characteristics

Centre	Geographic location	Area deprivation levels*:	Positive deviant/low engager (criteria described above):
1	North West	5th Quintile of deprivation	Positive deviant
2	South East	1st Quintile of deprivation	Low engager
3	North West	5th Quintile of deprivation	Positive deviant
4	Midlands	2nd Quintile of deprivation	Low engager
5	Yorkshire	4th Quintile of deprivation	Moderate engager

*5th Quintile of deprivation = most deprived area of the country;
1st Quintile of deprivation = least deprived area of the country

Table 3.6 Interviews and focus group participant characteristics

Interviews	*n*	*n* = recruited from positive deviant or low engaging centres	Gender (M/F)
Local authority commissioners	4	2 positive deviants; 1 moderate engager; 1 low engager	3 Female; 1 Male
HENRY coordinators	4	2 positive deviants; 2 low engager	3 Female; 1 Male
Centre managers	5	2 positive deviants; 2 low engagers; 1 moderate engager	5 Female
HENRY facilitators	4	1 positive deviant; 2 low engager; 1 moderate engager	4 Female
Centre staff	5	2 positive deviants; 2 low engagers; 1 moderate engager	5 Female
Focus groups	***n***		**Gender (M/F)**
Parents that had previously attended a HENRY programme	36	11 from positive deviant centres; 20 from low engager centres; 5 from moderate engager centre	36 Female

3.3.2 Barriers and levers to engagement

Twelve out of 39 CFIR constructs were identified as influencing participant engagement with HENRY, representing all domains (characteristics of the intervention, outer setting, inner setting, characteristics of individuals and process). Four parent level barriers and levers to engagement identified by Mytton et al. (2014) were also described by participants. No data fell outside ~~of~~ the deductive framework. Data mapped within these constructs and themes are summarised below with supporting quotes (Table 3.7). Key constructs are then described.

Table 3.7 Identified constructs that are consistent with CFIR and literature on parent engagement with parenting programmes

Code	Example quote
CFIR Constructs	
Intervention characteristics: Adaptability	Some HENRY facilitators described how they adapted programme material and activities to make sessions more engaging: *“If I started talking about trans fats and saturated fats and hydrogenated fats, they would just switch off; “I don’t know what you’re talking about”. So what I do is, I bring a tin of beans in and I would just talk about good fats and bad fats.” (HENRY Facilitator)*
Intervention characteristics: Design quality and packaging	The HENRY programme was perceived to be a high quality programme by commissioners, managers and centre staff. It was also highly acceptable to participants: *“I think it’s excellent, excellent. My favourite thing is the fact that it’s so non-judgemental. It’s just, “this is the information, it’s up to you what you do with it”, and the fact, for somebody like me, who’s very stubborn, the fact that it’s not, “these are the rules and you have to do it”, it makes me much more likely to do it.” (Parent)*
Intervention characteristics: Cost	The price of commissioning HENRY was described by some commissioners as being prohibitive: *“The cost of HENRY is now getting prohibitive. I’ve really stayed true generally, I’ve moved my budgets around, I paid a lot for staff to go and train. But the actual cost of the licence and then the books that you have to buy, and then the resources after that, and actually, they’re pricing themselves out of the market” (Commissioner)*
Intervention characteristics: Evidence strength and quality	Commissioners described the value of participant outcome data to inform future commissioning decisions: *“We’ve had one of our first reports back from HENRY which is invaluable to us here, you know, because then, when I’m going to commission and strategic meeting with heads of service around this work I can demonstrate back, this is what your staffing’s being doing, this is what a difference they’re making, and that helps it stay quite high on the agenda of people.” (Commissioner)*

Code	Example quote
Outer setting: External policies and incentives	Some centre managers described how external strategies influenced the programmes that were prioritised within centres: *"Our targets are set by the local authority at an advisory board in the beginning of the year, so if you have a certain level of obese children in your area at reception class then you have to place HENRY or some sort of healthy living as a priority (Centre manager)*
Inner setting: Implementation climate	The local authorities differed in their implementation climate towards HENRY i.e. HENRY was more embedded in some areas than in others: *"It feels like the integration of HENRY in [local authority] feels a little bit tepid" (Commissioner)*
Inner setting: Leadership engagement	Children's centre managers directed the implementation of HENRY in their centres and therefore, obtaining their engagement with HENRY was important: *"The manager is pretty crucial actually because my understanding is they've got a lot of freedom about what's actually delivered in their centre. I think they actually need to be committed to HENRY" (Commissioner)*
Inner setting: Available resources	Funding constraints experienced at the local authority level impacted upon local implementation of HENRY, for example, the number of staff trained available to deliver the programmes: *"We would like to offer the core training to all our children centre and health visiting staff but we just don't have the funding" (Commissioner)*
Inner setting: Access to knowledge and information	Some members of staff expressed an interest in attending training on HENRY, or attending the HENRY programme itself to increase their knowledge around the programme: *"I'd love to attend a course because I think attending a course gives you a feel of it and you can really promote it. If you've really enjoyed it you can promote it with such gusto." (Staff member)*
Characteristics of individuals: Knowledge, & beliefs about the intervention	All interviewed stakeholders placed value on HENRY and felt that it was beneficial for families that attended: *"I've seen HENRY have a really positive impact; really, really positive […] I think, if you have got a good facilitator, you have got a good group, the impact is massive, it really is." (Centre manager)*

Code	Example quote
Characteristics of individuals: Personal attributes	The personal attributes of staff members responsible for delivering HENRY were influential in motivating families to attend: *"I think it's once you know who's going to be doing the course, that reels you in" (Parent)*
Process: Champions	The HENRY facilitators 'championed' HENRY in their centres, dedicating themselves to promoting the programme: *"I can't do, say, be excited enough about HENRY. It really is a passion of mine since I've trained in it, and yeah, it should reach as many parents as possible. I think all parents should be offered the chance to go on it" (HENRY facilitator)*
Parent level facilitators	
Group experience	Parents described how group bonds were formed over the 8 week programme as a result of sharing advice, tips and experiences. *"We all came up with our problems and then we tried to solve them; whether it worked or not, it was really good. It was like a real mix of people. And people were like 'oh no, he's still only eating chips and the group were trying to come up with something again." (HENRY parent)*
Role of deliverer	Participants described how they were more likely to attend if they knew and liked the facilitator who was delivering the programme "*I think it's all in who approaches you as well because, if certain members of staff had approached me about it I would have outright just said 'nah'" (HENRY parent).*
Parent level barriers	
Participant constraints	Parents described how practical issues could act as a barrier to engagement, such as a child not settling in the crèche or returning to work *"I know a girl I did it with and I think her baby were ill and stuff like that, so just things like that, like practical matters, that's why she stopped coming" (HENRY parent)*

Code	Example quote
Social and cultural barriers	Some parents described how people they knew were put off from engaging with the children's centres due social and cultural factors such as language barriers or lack of confidence *"Some people can't read, they don't have a chance to go out and get socialised, or get information. Like if a daughter in law is coming from abroad, she's not allowed to go out" (HENRY parent)*

3.3.2.1 Key constructs

The key constructs identified as influencing participant engagement with HENRY highlighted a hierarchical influence over engagement. Factors influencing engagement with HENRY began at the commissioning level (local authority commissioners) which appeared to have a 'spill-over' effect on local implementation of the programme (inner setting), that is, the 'implementation climate', 'available resource' and the level to which staff had 'access to knowledge and information' on HENRY. Perceptions of the 'evidence strength and quality' surrounding the HENRY programme differed between commissioners and may have been influenced buy-in levels. The outer setting (i.e., 'external policies and incentives') also influenced whether managers adopted a universal (open to all families) or targeted (based on families need of the programme) approach to recruitment which influenced parent perceptions of the HENRY. The 'role of the facilitator' and 'group experience' positively motivated some parents to enrol and attend. However, 'social and cultural barriers' were described as acting as a barrier to engagement. These constructs are described in detail below with supporting quotes, in the order of their hierarchical influence.

Implementation climate (Inner setting)

Implementation climate describes the capacity to which settings are expected to use an intervention and the level to which it is supported, rewarded and expected (Damschroder et al., 2009). The implementation climate around HENRY appeared to be influenced by the degree to which local authority commissioners were engaged with the programme. In interviews with commissioners, one described how HENRY was the "cornerstone" of their obesity strategy (moderate engager), and two others described how HENRY was well supported in their areas (positive deviant, and low engager):

> *"Childhood obesity is a major issue at the moment so part of my responsibility was designing the city strategy around how we might help, prevent and manage childhood obesity, and HENRY is really a cornerstone of that strategy […]. We have now got HENRY firmly embedded in [local authority] as a requirement for centres to run three groups per annum in each cluster" (Commissioner; moderate engager)*

> *"We really like the approach, you know, it's very collaborative. That's our whole ethos really and that's why we love it so much. I've put a lot of funding and commitment to making HENRY happen in [local authority] […] It's at the forefront of our health programme, absolutely." (Commissioner; low engaging centre)*

In contrast, commissioners representing the other centres (positive deviant centres) described how HENRY was not at the top of the agenda as services were becoming more social care focused:

> *"It feels like the integration of HENRY in [local authority] feels a little bit tepid. […] It's becoming increasingly difficult to engage in true prevention. I would argue that, the evidence that I see, is that when they talk about prevention they actually mean prevention of something else and they mean preventing children from going into social care which is a completely different model to a public health model." (Commissioner; positive deviant centre)*

Observations of the children's centre revealed that where HENRY was prioritised and supported by local authorities, its principles and practices appeared to be well integrated into other sessions delivered in the centre. In these centres, the programme was well promoted and parents visiting them were familiar with the programme:

> *"During observation of a nursery session, the room leader approaches me to talk about HENRY. She says that they have seen so many changes in the parents and the children as a result of them attending the programme. She also explains that within the centre itself, they adopt HENRY principles to help improve eating behaviours across the board, for example encouraging children to try new foods during meal times and encouraging parents to bring in different kinds of fruit for snack time. Every time a parent does bring in a piece of fruit for their child, they receive a counter to place in a jar as part of a 'collective reward' initiative which is a key element of the HENRY approach." (Ethnographer observation; moderate engaging centre)*

In centres where commissioners described HENRY being less of a priority, HENRY programmes were not visibly promoted in the centres, and parents were predominately recruited during outreach work via health visitors or family outreach workers, limiting the opportunity for parents to learn about and engage with the programme. In addition, staff members that were not trained to deliver HENRY were not involved in its implementation or knowledgeable about the programme, meaning that HENRY messages were not incorporated in others sessions. However, the implementation climate did not appear to reflect the differences that would be expected between positive deviant, moderate engaging and low engaging centres that were identified from the data used for sampling. For instance, in one positive deviant centre, HENRY did not appear to have a strong implementation climate:

> *"There are lots of display boards in the reception but there are no HENRY displays or HENRY posters. HENRY is also not included on the 'What's on' guide […]. I am introduced to a parent engagement worker at a busy baby weigh in clinic. Her role is to meet and greet the parents, hand out leaflets showing what courses are going on, registers new people to the centre and occasionally offer one to one support and do home visits. I ask her if she tells parents about HENRY but she says doesn't really have much to do with the programme, and that external teams, such as health visitors are the only ones that approach people to attend." (Ethnographer observation; positive deviant centre)*

Evidence strength and quality (intervention characteristics)

All commissioners in the sample described the importance of programme evaluation data in making decisions around continued use of HENRY. HENRY central office provide programme level data to commissioners at regular intervals on participant reported outcomes, such as self-reported lifestyle and family eating behaviours. Three commissioners (one representing a positive deviant centre and two representing low engaging centres) described that they were satisfied with the reporting method and outcomes. However, the other two commissioners were unaware of receiving these reports (positive deviant), or felt that they did not receive it often enough (moderate engager).

“There have been some glitches at HENRY so that flow of data has not been as quick to come as I’d have hoped […] I think we need to get better data because it does help people to understand the impact of things and encourage further involvement.” (Commissioner; moderate engaging centre)

These data were likely to influence commissioner ‘buy-in’ with the programme and therefore act as a barrier or lever to engagement. However, commissioner perceptions of whether programme outcome data was available to them did not correspond to whether centres were identified as positive deviant or low engaging centres during sampling.

Available resources (inner setting)

Delivering HENRY programmes requires local authorities to purchase an annual HENRY licence, along with staff training and programme resources e.g. parent handbooks, incurring extra costs. Funding streams available for HENRY were described as uncertain by four out of the five interviewed commissioners (two positive deviant and two low engaging centres), casting doubt on whether programmes would continue beyond their current licence period. In addition, uncertainties around funding prevented HENRY from being rolled out more widely across the local authorities due to a lack of funds available to train additional facilitators, or indeed, replace trained facilitators if they moved on from their position. The offer of core training was also unlikely for staff members not trained to deliver HENRY programme, despite acknowledged benefits. The level of available resources did not appear to be linked to positive deviant or low engager categorisations assigned during sampling:

“In [local authority] the actual older person population is quite high and obviously there’s a lot of money goes towards looking after older people, as it should do. But you don’t necessarily get any additional funding for that, and the other thing is that there’s a lot of worried well-people possibly who are educated, middle-class and much more likely to go and ask for support about their health issues than people from deprived areas. So, actually, they take more time in terms of health services, so in terms of public health and the PCT, a lot of that money was taken away to support the acute hospitals”. (Commissioner; low engaging centre)

> *"We would like to offer the core training to all our children centre and health visiting staff but we just don't have the funding. I mean I would definitely recommend the core training to all staff, and in fact one of our community 0-19 teams which is the biggest said, 'Oh, can our staff be trained?' 'Well if you can find some money'!" (Commissioner; low engaging centre)*

Access to knowledge and information (inner setting)

The lack of training provision resulting from restricted budgets was emphasised by members of staff. In three centres (one positive deviant and two low engaging centres) staff members described in interviews and informal conversations how they would have liked to learn more about what the programme entailed to be more knowledgeable when approaching parents to attend. Some were concerned that their lack of knowledge prevented them from providing accurate representation of the programme when approaching parents to attend:

> *"I know a little bit about HENRY, you know health and well-being etcetera, and it's for the well-being of the children etcetera, but it's like making a referral blindly. Because even though I've been online, on HENRY's website, to read about it, to make myself aware…I still feel like I'm a stranger! I have no idea what the HENRY is about*" (Staff member, low engaging centre)

Interviewees from both positive deviant and low engaging centres reported similar views and experiences.

External policies and incentives (outer setting)

Two managers described that there was an expectation from Ofsted (Office for Standards in Education) and the local authority that vulnerable families were prioritised to engage in children's centre services (including HENRY). Therefore in their centres, instead of adopting a universal approach to recruitment as designed, they adopted a targeted approach, whereby only the most vulnerable families or those demonstrating a perceived need (e.g., dietary intervention) were approached to attend:

"I'm responsible with the team to look at who gets a place, who's a priority. We're quite tied with crèche, so ratios can be a bit of a problem. In terms of how we recruit, we prioritise parents. Most are referred through health visitors or social care. So when we receive a referral from a health visitor, we'll actually talk to them and say "What is the need? What is it they need?" So, for example, if the parent is just socially isolated they probably wouldn't be priority to a parent where obesity runs in the family; the child is eating six hash browns for breakfast, that kind of thing. So we really talk to who the referrers are to check, just to make sure we get the right families on the course." (Centre manager; positive deviant centre)

One facilitator who delivered HENRY in a centre that used a targeted approach said that this acted as a barrier to engagement, since it was important to have a mix of targeted and self-referred parents on a programme to encourage group discussion and enhance group dynamics. They went on to describe that 'targeted' parents were often reluctant to join in group discussions and engage with the solution focused approach as, in contrast to those actively seeking to enrol on the programme, they were not ready to make behavioural changes:

"It's been particularly hard with the targeted groups to get the parent's solution focus stuff going. Previously, we've seen parents share things, whereas this time round we actually had to say, "this is your task for the next 6 weeks" because it's not coming from anywhere else" (HENRY Facilitator; positive deviant centre)

Perceptions of HENRY among parents visiting the centres also appeared to be influenced by the targeted approach. Some parents from a centre that adopted a targeted approach to recruitment perceived that HENRY was only for families that were overweight or that required additional parenting support, suggesting stigma around the programme. These views were expressed by parents attending a breastfeeding support session:

> *"Whilst chatting to the mothers in the group, one says that HENRY didn't appeal to her because it was for the deprived parents who lived in direct proximity to the centre, which is predominately high-rise social housing. Another parent joins in the conversation and explains that childhood obesity rates are high in their area, and therefore the parents of obese children need to attend courses like HENRY to teach them the importance of giving them a healthy diet and doing physical activity." (Ethnographer observation; positive deviant centre)*

Role of deliverer and personal attributes (parent perspective)

In some centres (representing positive deviant, moderate engager and low engaging centres), parents explained in focus groups that a lever to engagement was knowing and liking the facilitator that would be delivering the programme:

> *"I think it's all in who approaches you. Because it was [name of facilitator], everyone knows him and he's like the go to person if you need anything. He's like everyone's dad figure isn't he, he's there if you need some help, advice, someone to talk to, he's there for you. If you need directing in one way or another, he's there and he'll do it… if the wrong person had approached me about it, I wouldn't have done it." (Parent; moderate engaging centre)*

Facilitators from the same centres described how their existing relationships with parents allowed them to be sympathetic to parent's needs, which promoted parent engagement with the programme:

> *"The reason I think I do well [at recruitment and retention] is because I know personally how to meet their needs, and know where the parents are coming from, being sympathetic and basically knowing a little bit about their background. And you have to think, okay, this mum is coming with this baggage, and you work alongside with that baggage and you support them." (HENRY facilitator; low engaging centre)*

In focus groups held at all centres, parents that had attended HENRY described that they had had a positive experience due to the skills and personal attributes of the facilitator:

> *"She discussed her problems with us also; like she used to have a wine at the end of the day and she wanted to lessen her wine consumption at night and she made dinner for herself and she really drank on the night, she told us that. So it was like good to look to her and see that ok she has problems also." (Parent; positive deviant centre)*

In addition, some parents described in focus groups (positive deviant, low engaging and moderate engaging centres) that the facilitator had encouraged them to make wider changes in their life:

> *"She kept pushing us to you know, get out a bit, experience more stuff outside instead of just being indoors all the time. The housework does not stop after that. You know it carries on, on, on. It's just good to know sometimes, just get out and you know, if gives you a fresh mind as well, so it really helped me a lot." (Parent; low engaging centre)*

Social and cultural barriers and participant constraints (parent perspective)

In all centres, parents described that potential barriers to engagement, including language, shyness and a fear of groups, particularly within their communities where they knew people who did not engage with the children's centre:

> *"Some people can't read, they don't have a chance to go out and get socialised, or get information. Like if a daughter in law is coming from abroad, she's not allowed to go out" (HENRY participant; low engaging centre)*

In addition, practical constraints were also described as being a barrier to engagement in all centres such as child illness, returning to work, contrasting appointments and the weather:

> *"I just think people are so busy now. The pressure of life. You know, it's a great idea and you get lots from it but if other things take over; work, family commitments, then it's gonna come first" (Parent; low engager centre)*

Group experience (parent perspective)

All parents that attended the focus groups had enjoyed the social aspect of HENRY, where they enjoyed "conversations with other adults" (parent from moderate engaging centre*)* and a "warm cup of tea" (parent from moderate engaging centre). Many parents were sad when the programme came to an end because they had developed bonds with other parents and had enjoyed taking part in the group discussions, supporting each other to make small and achievable changes:

> *"We all came up with our problems and then we tried to solve them; whether it worked or not it was really good. It was like a real mix of people. And people were like 'oh no, he's still only eating chips' and the group were trying to come up with something again." (Parent; positive deviant centre*)

However during observation of one HENRY session (moderate engaging centre), delivery of the programme appeared rushed and parents were asked to move quickly from subject to subject. This reduced the time spent on group discussions, suggesting that time dedicated to building group bonds differed between centres:

> *"The session seemed slightly rushed and it felt that the parents wanted to discuss some things in more depth but there was not enough time. For example, one mother touched on her depression, another mentioned problems with her teenage son, and another suffered conflict surrounding mealtimes with her four children. Although the facilitator did offer brief advice, it felt like the parents wanted more group discussion and support on this, but there was no time before moving on to the next subject." (Ethnography notes, moderate engaging centre)*

3.4 Discussion

3.4.1 Discussion of results

Consistent with the consolidated framework for implementation research, parent engagement with HENRY was influenced by a range of factors within the children's centre and local authority context. In addition, the findings highlighted that there was a hierarchical 'spill-over' effect (Michie et al., 2011), whereby commissioner engagement with the programme influenced children's centre implementation, which in turn influenced parent engagement with the programme. Parent level factors were consistent with the literature on parent engagement with parenting programmes (Friars and Mellor, 2009, Gross et al., 2001, Owens et al., 2007b, Beatty and King, 2008, Wheatley et al., 2003, Pearson and Thurston, 2006), highlighting the importance of the facilitator in motivating parents to attend, the social support provided by the group and barriers faced by parents (e.g., practical constraints and social and cultural factors.

Hierarchical influences on implementation outcomes are consistent with implementation climate theory (Klein and Sorra, 1996). This theory proposes that a strong implementation climate leads to greater training provision for staff, increased motivation to use the intervention in daily practices and the removal of obstacles in using the intervention. The theory also proposes that the implementation climate is set by influential individuals and their perceptions of whether the intervention fits within their organisation. Therefore, as observed in this study where commissioners prioritised delivery of HENRY programmes, a strong implementation climate was set that supported implementation of the programme. This indicated that the HENRY participant engagement intervention should aim to promote buy-in at the commissioning level.

The findings indicated that a stronger implementation climate was associated with increased promotion of HENRY and incorporation of HENRY principles and practice into other sessions. This climate was also supportive of staff and parent awareness of the programme. Greater awareness and accessibility of the programme has previously been reported as resulting in normalisation of parenting programmes, which is beneficial for promoting engagement (Lindsay and Totsika, 2017, Sammons et al., 2015).

Commissioner perceptions of the quality of evidence supporting HENRY was mixed. Although local authorities are increasingly being advised to prioritise obesity prevention efforts, the commissioning of programmes such as HENRY is not mandated. Rather, local authorities are encouraged to consider family based programmes within the wider package of interventions (National Institute for Health and Care Excellence, 2006). As available funding for public health initiatives is increasingly being reduced (Action for Children et al., 2016), commissioners need to select programmes to commission that demonstrate best value for money. Therefore as the evidence base surrounding the effectiveness and cost effectiveness of HENRY is still being developed, data demonstrating the outcomes achieved by families that attend the programme (e.g., diet and lifestyle changes), was described as important to inform strategic decisions around for continued use and support for the programme. As such, improving the provision of outcome data was an important area to consider for the participant engagement intervention to secure local authority buy-in.

Some managers described how only those demonstrating a 'need' for HENRY were approached to attend, which likely hindered engagement. Families engaged with children's centres prefer to attend programmes that are offered universally, to reduce feelings of stigma (Grayson, 2013). But offering services universally can present a challenge to local authorities, as health inequalities can be exacerbated if services are disproportionally used by people who do not require their support (Marmot et al., 2020). Further, allowing too many people to attend could also be expensive, particularly where resources and creche facilities are provided Here, however, as there was no predefined criteria for 'need', managers and staff used their own perceptions of who would benefit from attending HENRY to support decisions on who to prioritise. Therefore, 'need' was open to interpretation (Lord et al., 2011), and as demonstrated here, staff members were not always clear on what the programme offered. This highlighted the importance of centres adopting a universal approach to recruitment that was proportionate to need to reduce associated stigma, in addition to raising knowledge levels of HENRY amongst staff.

The value placed on social support provided by group programmes has been frequently reported (e.g. Bryant-Waugh et al., 2007, Barlow et al., 2008, Wheatley et al., 2003). However, where programmes follow a strict manualised approach, such as HENRY, the need to stick to session timings may result in group discussions being rushed, limiting opportunities to build social bonds and share experiences. This strengthens arguments for flexibility versus fidelity in order to be

guided by the preferences of the group and agreeing which programme components are essential, and which are less so.

3.4.2 Reliability and Reflexivity

Qualitative research has been criticised in the past for lacking scientific rigour (Rolfe, 2006). However, it has been argued that ethnographical methods strengthen the quality of research (Morgan-Trimmer and Wood, 2016), as events are observed first-hand in their natural setting and the researcher can get as close as possible to the phenomena at study. Multiple methods of data collection are also used so that findings can be compared between data sources (Morgan-Trimmer and Wood, 2016, Hammersley and Atkinson, 2007) and relationships can be formed prior to interviews or focus groups creating a natural rapport with participants. But there are some challenges to ensuring validity of data in ethnographical studies. As previously described, researchers are required to observe and interpret events which potentially introduces bias~~es~~ and the researcher themselves can influence their surroundings (Paulhus,1984). There is agreement that the starting point of demonstrating reliability of the data is to ensure that all processes are transparent and systematic (Meyrick, 2006). Demonstrating reflexivity by considering and reporting on how one's own beliefs, values and presence may have influenced the research, should also be reported, so that the findings can be interpreted accordingly (Atkinson, 2014). Reliability and reflexivity are described in the following sections.

3.4.2.1 Reliability

Demonstrating reliability of the data within this study focused on obtaining a clear representation of the factors influencing engagement with HENRY. Therefore, multiple sites were observed in the research, allowing perspectives to be gathered from a range of participants in multiple contexts. This allowed issues to be identified that were consistent between sites along with those that were context specific. The research also sought an emic perspective (an insider view) to accurately describe situations and behaviours (Fetterman, 1989). Multiple research methods were employed to enable triangulation of data including participant observation, interviews with multiple stakeholders and focus groups (Patton, 1999). The positive deviant/low engager sampling approach reduced bias by allowing data to be collected from centres that did perform well at engaging parents to HENRY and those that did not, although the lack of patterns identified within the ethnography suggest that this approach was not robust. Use of a second observer during the first children's centre research visit and a second coder during data analysis ensured

consistent use of the data collection and analysis tools via investigator triangulation (Archibald, 2015). Interview and focus group topic guides were used to structure the data collection, so that questions were consistent between centres and stakeholder groups. In addition, use of a theoretical framework to guide the research provided organisation and structure to allow analysis and interpretation of the data to be transparent. A framework analysis approach and involvement of wider research team also strengthened the transparency of thought processes when establishing key concepts and themes.

3.4.2.2 Reflexivity

Reflexivity is the practice of researchers considering how their own presence can influence situations and how people behave in their presence (Atkinson, 2014). Researchers should also be mindful of how their own thoughts, feelings and background personally influence the research findings. Therefore, this section will provide a first-person account of my reflections on my role in the research.

My background is in public health nutrition, which is a population approach to promoting a healthy diet, to improve and maintain good health and reduce diet related illness. Therefore, my research interests were principally aimed at exploring the ways in which the implementation of HENRY could be optimised to achieve greater reach and impact to enable more people to benefit from its support. Data collection and analysis were thus undertaken through the lens of implementation science. It is acknowledged that this limited scope for exploring other factors that may have influenced parent engagement with HENRY such as sociological and psychological factors.

As a PhD student, I was new to qualitative research but developed my interview skills by attending training, discussing my technique with my supervision team and reviewing and reflecting on initial interviews. From this, I realised that during initial interviews in the first centre, there were some instances that I used closed, rather than open questions, moved the questions on quickly after the participant's initial response, or did not allow moments of silence for the participant to consider whether they wanted to add anything further. This potentially prevented greater insight being provided into participant's thoughts and experiences. In some interviews, I also lacked the confidence to ask participants how they felt their own practices may have influenced HENRY engagement. For example, when a manager described how they used a targeted approach to recruitment, I hesitated from asking how this may have influenced perceptions of HENRY among other parents. This was due to fear of challenging them, as they were in a senior position

and were the ‘gatekeepers’ of the research. However, I was able to recognise these limitations early on and addressed them in subsequent interviews and focus groups, which were much more exploratory and insightful.

During focus groups, I made a personal decision not to delve too deeply if a participant divulged personal information around their difficulties experienced in their life, such as mental health issues. As the aim of the research was to seek answers around how the implementation of HENRY could be improved, I did not feel it was appropriate to take the discussion in that direction or ask questions that some focus group participants may have found sensitive. Other researchers may have explored this in more detail. I also refrained from actively engaging individuals that appeared guarded or shy because I did not want to make them feel uncomfortable in my presence. On reflection, this was due to an assumption that they would have been reluctant to engage, but given the chance, they may have been happy to talk about their views and experiences. As such, it cannot be known whether making more effort to talk to these individuals could have presented valuable insight that was missed.

In one centre, language presented a barrier to informal conversations with some parents. In response, a member of staff that I developed a close relationship with introduced me to the families and facilitated conversations between us by initiating conversations and encouraging them to speak English. However, this could have introduced bias as the participants may have been reluctant to talk about some things in front of the member of staff, or felt obliged to talk positively about the centre and HENRY. Nevertheless in this particular centre, the focus group was particularly valuable in providing insight into social and cultural barriers influencing engagement with HENRY.

Overall during the ethnography study, I was able to develop a natural rapport with most parents and staff during the visits which provided me with a greater understanding of the context. This would not have been possible using most other research methods.

3.4.3 Strengths and Limitations

The ethnographic approach, informed by a strong theoretical model provided an in depth understanding of the cultural, organisational, and participant level factors that influenced participant engagement with HENRY. Being immersed in the centres allowed activities that influenced engagement to be viewed first hand and enabled relationships to be formed with participants so that they felt comfortable to talk freely. The focused ethnography approach allowed more centres to be visited than

in a traditional ethnography and key questions were considered *a priori* which focused the research. Input from the wider research team (including PhD supervisors) provided a wider perspective on key issues and constructs, strengthening interpretation of the data.

Some centres were identified as positive deviants using a set of criteria that reflected good recruitment. However, the interviews and observations did not reveal any differences in behaviour between low and high engaging centres. This may have been due to the sampling frame being informed by a snapshot of data on recruitment and retention as opposed to considering longer term historical recruitment patterns. In addition, the number of HENRY programmes delivered per year in each centre was not considered in sampling, which could have revealed differences in engagement expectations between centres. For instance, where a centre delivered just one programme per year, they may have found it easier or harder to engage parents than a centre that delivered three programmes a year. In addition, due to funding restraints and the narrowing of services over recent years, the priority placed in HENRY and investment in engagement efforts could have altered during the study period. Therefore, centres that had previously been successful at engaging parents (i.e., positive deviants) may no longer have prioritised HENRY engagement in their centres.

The recruitment approach for staff interviews involved centre managers identifying potential participants. This may have biased the findings as members of staff may have been selected that were likely to talk favourably about HENRY and the centres (Paulhus, 1984), although all interviewees were open about their views. All focus group participants had completed the HENRY programme prior to the focus groups. Therefore, their opinions may have differed to those that failed to complete the programme. This was due to an absence of parents that had dropped out of a HENRY programme volunteering to take part in the focus groups. Nonetheless, during interviews and focus groups, participants did provide a balanced view of factors influencing engagement.

3.5 Recommendations for participant engagement intervention

This study demonstrated that engagement with HENRY began at the commissioning level, where commissioner commitment and support for HENRY influenced children's centre implementation of the programme. These factors were at play prior to parents choosing whether or not to enrol on the programme, maintain attendance or achieve behaviour change. External factors were also influential in parent engagement, such as reduced funding for children's centres

and the move towards a targeted approach to recruitment. Addressing political and structural level factors was unlikely to be feasible for the participant engagement intervention. Therefore recommendations for the intervention that were gained from the ethnography study, centred on promoting the uptake of behaviours that were observed as being favourable to engagement. Broad recommendations are described below, and specific goals of the intervention are described in the following chapter (intervention development).

1. Promote engagement with HENRY among local authority commissioners to support a strong implementation climate.
2. Promote a whole-centre approach to HENRY whereby principles and practices are embedded throughout the centre, and programmes are delivered regularly to normalise and increase accessibility of the programme.
3. Increase provision of training for staff (formal or informal), so that all are confident to approach parents to attend and provide accurate information about what the programme entails.
4. Broaden promotional strategies to increase awareness of the programme amongst parents visiting the centre and local communities.
5. Harness the skills and personal attributes of the HENRY facilitator to optimise the participant experience, ensuring that sessions allow enough time for group bonds to develop.
6. Adopt a universal approach to recruitment to reduce stigma and ensure that all parents have access to the programme, regardless of perceived need.

Chapter Four: Development of the participant engagement intervention

4.1 Introduction

This chapter describes the development of the HENRY participant engagement intervention, which draws upon the work described in Chapter Two (literature review) and Chapter Three (ethnography study). The chapter begins by outlining the study aims and objectives before discussing potential frameworks considered for use to guide the development of the intervention. The process by which the participant engagement intervention was developed, and the outcome of that process are then detailed.

This study was published in a peer review journal:

Burton, W., Sahota, P., Twiddy, M.,*et al.* (2021) The Development of a Multilevel Intervention to Optimise Participant Engagement with an Obesity Prevention Programme Delivered in UK Children's Centres. *Prevention Science.* https://doi.org/10.1007/s11121-021-01205-y

4.1.1 Aims and objectives

4.1.1.1 Aim

The aim of this study was to develop a participant engagement intervention to promote parent engagement with HENRY.

4.1.1.2 Objectives

1. To use the findings of the literature review (Chapter Two) and ethnography study (Chapter Three) to identify behaviours to promote parent engagement with HENRY.
2. To develop a participant engagement intervention using an appropriate intervention development framework.
3. To develop a logic model proposing how the intervention activities will achieve short-,medium-, and long-term outcomes.

4.1.2 Guiding framework

Several frameworks exist to help guide the development of complex interventions, which all differ in their approach. For instance, some base their approach on ascertaining the views and actions of people who will use the intervention, such as the Person-based approach (Yardley et al., 2015) or Co-design (Bessant and Maher, 2009). Others, such as intervention mapping (Bartholomew et al., 1998) focus on ensuring that interventions are underpinned by a combination of research evidence and formal theory. Identifying the most suitable approach maximises the chances of an intervention being effective and sustainable (O'Cathain et al., 2019). The participant engagement intervention aimed to change the behaviours of individuals involved in the implementation of HENRY by drawing on the evidence of what was most likely to work. Therefore, intervention development frameworks were considered for use that emphasised the use of behaviour change theory and evidence to underpin the design. These included: Medical Research Council (MRC) Framework for Developing and Evaluating Interventions (Campbell et al., 2000), Intervention Mapping (Bartholomew et al., 1998) and The Behaviour Change Wheel (Michie 2015).

4.1.2.1 MRC: Framework for design and evaluation of complex interventions to improve health. (Campbell et al., 2000)

The MRC framework for designing and evaluating complex interventions (Campbell et al., 2000) was published to help researchers recognise the range of available methods for intervention development, and to assist with recognising which are most appropriate (Campbell et al., 2000). This intervention development guidance is widely cited. An updated version was published in 2006 (Craig et al., 2006) and a further update was also planned for 2019, but was still under development in 2021. Craig et al. (2006) argue that best practice for developing interventions involves a systematic approach using the best available evidence and appropriate theory. The framework summarises four main stages involved in developing and evaluating an intervention: development, feasibility/piloting, evaluation and implementation (Figure 4.1). The intervention development phase begins with identifying the relevant evidence base, preferably via systematic review. The next stage is to identify relevant theory in which to underpin the intervention, and the final stage in the development phase is to model how the intervention might be implemented on a wide scale. Assessing feasibility and/or piloting the intervention follows the development phase prior to evaluation. The multidirectional arrows in Figure 4.1 illustrate the process is iterative, for example, feasibility/piloting may also lead to further development.

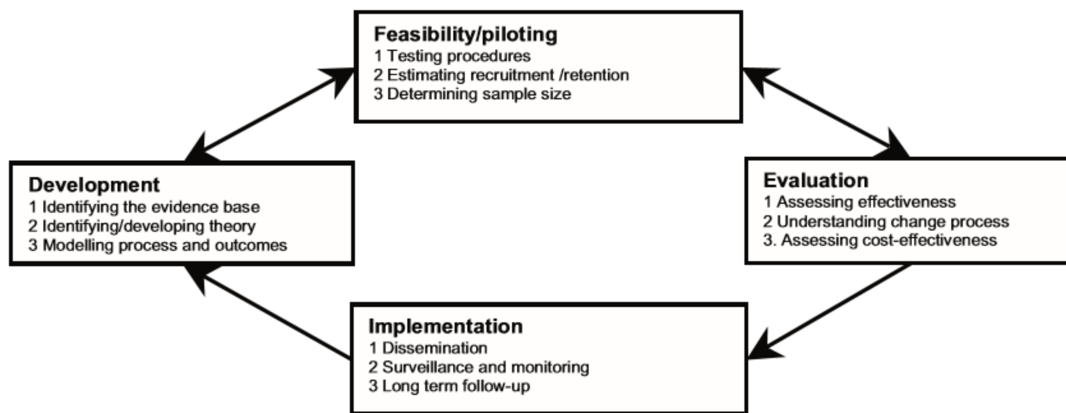


Figure 4.1 Key elements of the development and evaluation process (MRC, 2008)

This framework is useful for highlighting the overall lifespan of developing a complex intervention, along with emphasising the importance of incorporating evidence and theory into intervention design. However, the guidance is broad, and no direction is provided on how to apply the evidence and theory. For instance, Stage One of the framework encourages developers to identify all the existing evidence relevant to the intervention, but direction on the specific evidence that is being sought and how to apply this evidence is not provided. Stage Two advises developers to identify relevant theory to understand how a specific behaviour might be changed, but guidance is not provided on how to select the most appropriate theory or how this might shape the final intervention components. Examples in the literature have used the MRC framework alongside other intervention development approaches. For example, Roberts et al. (2020) used both the MRC framework and Knowledge to Action frameworks (Graham et al., 2006) to guide the development of a nutrition intervention for hospitalised patients. However, while the Knowledge to Action framework reportedly guided their intervention development process and research approach, the role of the MRC framework was unclear. Rather than providing a structured intervention development guidance, the MRC framework appears to serve more as a prompt to consider its overarching principles to ensure scientific rigour.

4.1.2.2 Intervention Mapping (Bartholomew et al., 1998)

Intervention Mapping is a framework designed to support the development of health promotion programmes, by addressing the challenges in selecting and applying relevant theory, empirical evidence and stakeholder engagement (Bartholomew et al., 1998). The framework provides a detailed protocol for systematic intervention development. The process begins with identifying the problem (i.e., the behaviours

that the intervention aims to change). Behaviour change theory is then drawn upon to consider the determinants of those behaviours. Stakeholder involvement, the evidence base and theory are later used to identify methods in which to address those determinants. The final stages involve using the theory and evidence to design the intervention components before considering how the intervention will be adopted, implemented and evaluated (Figure 4.2).

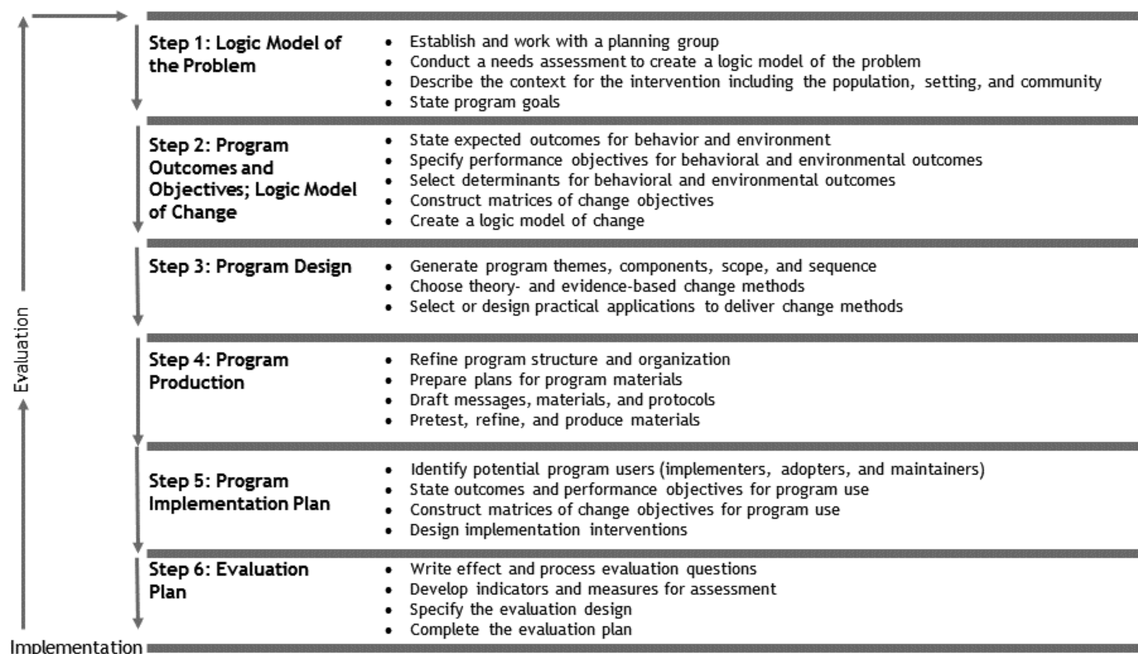


Figure 4.*2* Intervention Mapping protocol (Bartholomew et al., 1998)

The Intervention Mapping approach provides greater direction to intervention development than the MRC framework. In particular, the framework prompts intervention developers to seek a full understanding of behaviours the intervention is aiming to change prior to designing the intervention to change them. The framework protocol instructs developers to base their intervention design on relevant theory. However like the MRC framework, direction or facilitation by which to select a theory, is not provided. The importance of reporting on those decisions is also not highlighted. As such, many interventions reported in the literature that have used the Intervention Mapping approach fail to present decision making processes on why their theories were selected over others to underpin their designs (e.g., Moon et al. (2020), Noh and Choi (2020)). This limits the use of these studies to inform the design of future interventions.

4.1.2.3 Behaviour Change Wheel (Michie et al., 2011)

The BCW was developed to bring together existing intervention development frameworks, to utilise their strengths and overcome any limitations. For example, the authors describe how elements of Intervention Mapping framework are incorporated into its design. The aim of the BCW is to be coherent, comprehensive and provide clear links to behaviour change theory (Michie et al., 2011). As demonstrated, these features are missing from both the MRC and Intervention Mapping frameworks. The BCW framework uses a pre-selected model of behaviour to underpin the development process: the COM-B model of behaviour which stands for capability, opportunity and motivation. Within the model, capability can either be classed as 'physical' (e.g. physical skills) or 'psychological' (e.g. knowledge), opportunity can be classed as 'physical' (e.g. resources) or 'social' (e.g. interpersonal influences), and motivation can be classed as reflective (e.g. beliefs about what is good) and automatic (e.g. impulse). The COM-B model proposes that one or more of these components need to be influenced for behaviour change to occur (Figure 4.3).

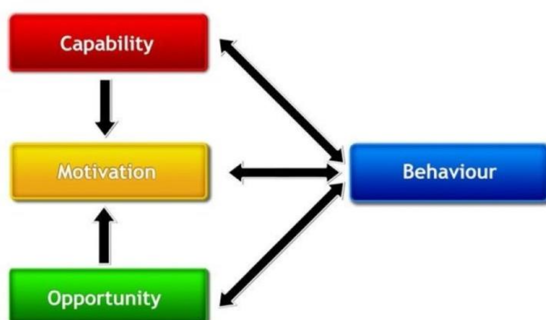


Figure 4.3 COM-B model of Behaviour (Michie et al., 2011)

The BCW framework comprises three layers (Figure 4.4). At the centre of the framework is the COM-B model of behaviour which signifies that an understanding of behaviour is required before an intervention can be planned. Following this, the next layer depicts potential intervention functions that should be appropriately selected according to behavioural components that the intervention aims to change. The outer layer prompts developers to consider whether policy could be developed or changed to support the intervention, and which might be most appropriate. Beyond this conceptual model, the BCW framework provides step by step guidance to develop the intervention, including the provision of decision-making tools to decide which behaviour change targets to prioritise along with intervention functions and behaviour change techniques to incorporate.

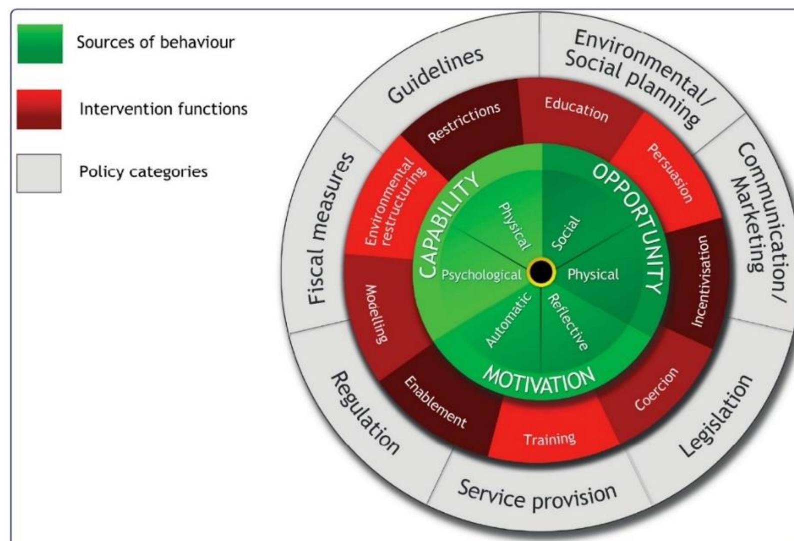


Figure 4.4 The Behaviour Change Wheel: A guide to designing interventions (Michie et al., 2011)

The BCW intervention development process is made up of three stages (Figure 4.6). Stage one begins with specifying the problem in behavioural terms that the intervention aims to address before creating a list of potential target behaviours that may resolve that problem. The list of potential target behaviours is then narrowed down to a 'shortlist' to ensure the intervention is feasible within available resources and timescales. Following this, the COM-B model of behaviour is applied to understand which components of capability, opportunity or motivation need to be influenced for the target behaviours to occur. Stage two matches COM-B components identified in stage one with appropriate intervention functions. Activities within this stage include deciding on the intervention function to use by following APEASE criteria (affordability, practicability, effectiveness, acceptability, safety and equity (Michie 2015). Potential policy changes are then considered using the same method. In the final stage, the BCW matches selected intervention functions to suggested behaviour change techniques that are most likely to work. APEASE criteria is once again applied to select which behaviour change techniques will be incorporated in the final intervention design before designing the mode of delivery.

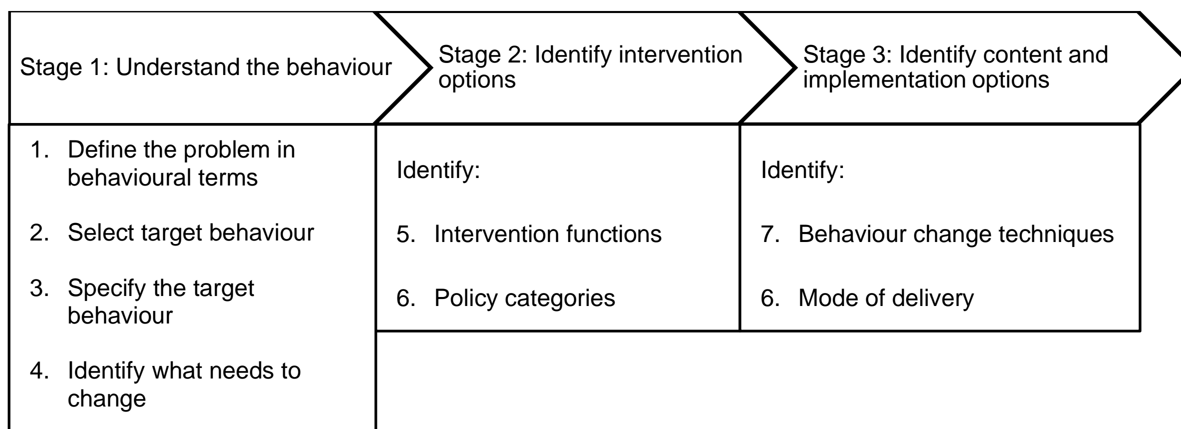


Figure 4.5 Behaviour change wheel stages (Michie, Van Stralen and West 2011)

The BCW framework met the needs of the project over and above the other two frameworks. The COM-B model of behaviour at the centre of the framework is logical and simple to apply. The clear links to appropriate intervention functions and behaviour change techniques along with structured decision-making processes, provide a systematic and transparent approach to intervention development. Therefore, the BCW was selected to guide the development of the HENRY participant engagement intervention. Nevertheless, there are recognised limitations to the approach. One is the necessity to underpin interventions with the COM-B model of behaviour, where other theories may be more relevant to the specific target population or problem being addressed. For example, the Transtheoretical model (or Stages of Change) (Prochaska et al., 2009) which considers the various stages an individual goes through prior to achieving behaviour change. Additionally, guidance is not provided on how to incorporate more than one theory within the BCW; for example, implementation theory, which might have been relevant for the participant engagement intervention in order to consider behaviour change outcomes within the wider context. The BCW does suggest that intervention developers apply the Theoretical Domains Framework (French et al., 2012) if required, which is a framework developed to synthesise key theoretical constructs from both psychological and organisational theory. But with psychology at its heart, the BCW does not pay much attention to what sociological/organisational changes might be needed to facilitate change.

4.2 Methods

The development of the participant engagement intervention occurred alongside the focused ethnography study described in Chapter Two (July-December 2015). This enabled the intervention to be developed iteratively, so that ethnography findings could inform the target behaviours, and potential ideas considered for the intervention design could be explored in more detail in subsequent ethnographical field work visits. Figure 4.6 outlines the process used for developing the intervention.

4.2.1 Intervention development team

Before the intervention was developed, an intervention development team was assembled. The intervention development team comprised three academics, three HENRY stakeholders and was chaired by the PhD candidate. Academics had experience in childhood obesity, applied health research and behaviour change. Two of its members (MT and MB) were on the current supervisory team. HENRY stakeholders comprised: a local authority HENRY coordinator who was responsible for coordinating HENRY activity within a local authority, a parent that had attended a HENRY programme and a representative of the HENRY national office. The PhD candidate convened the team, organised the meetings, facilitated discussions and led each stage of the intervention development process and activities. The team met four times during the process and each meeting lasted approximately three hours.

4.2.2 Parent advisory group

A parent advisory group involved in the wider programme of work was consulted during the project which was made up of a group of six local parents, three that had attended a HENRY programme and three that had not. Parent advisory group meetings were led by the PhD candidate and were held twice during the intervention development period. In the first meeting, initial findings of the ethnography study were presented. The group then brainstormed which behaviours might be potentially suitable to target in order to promote engagement with HENRY. In the final meeting, the group discussed ideas on the design of intervention components (see Section 4.3.4).

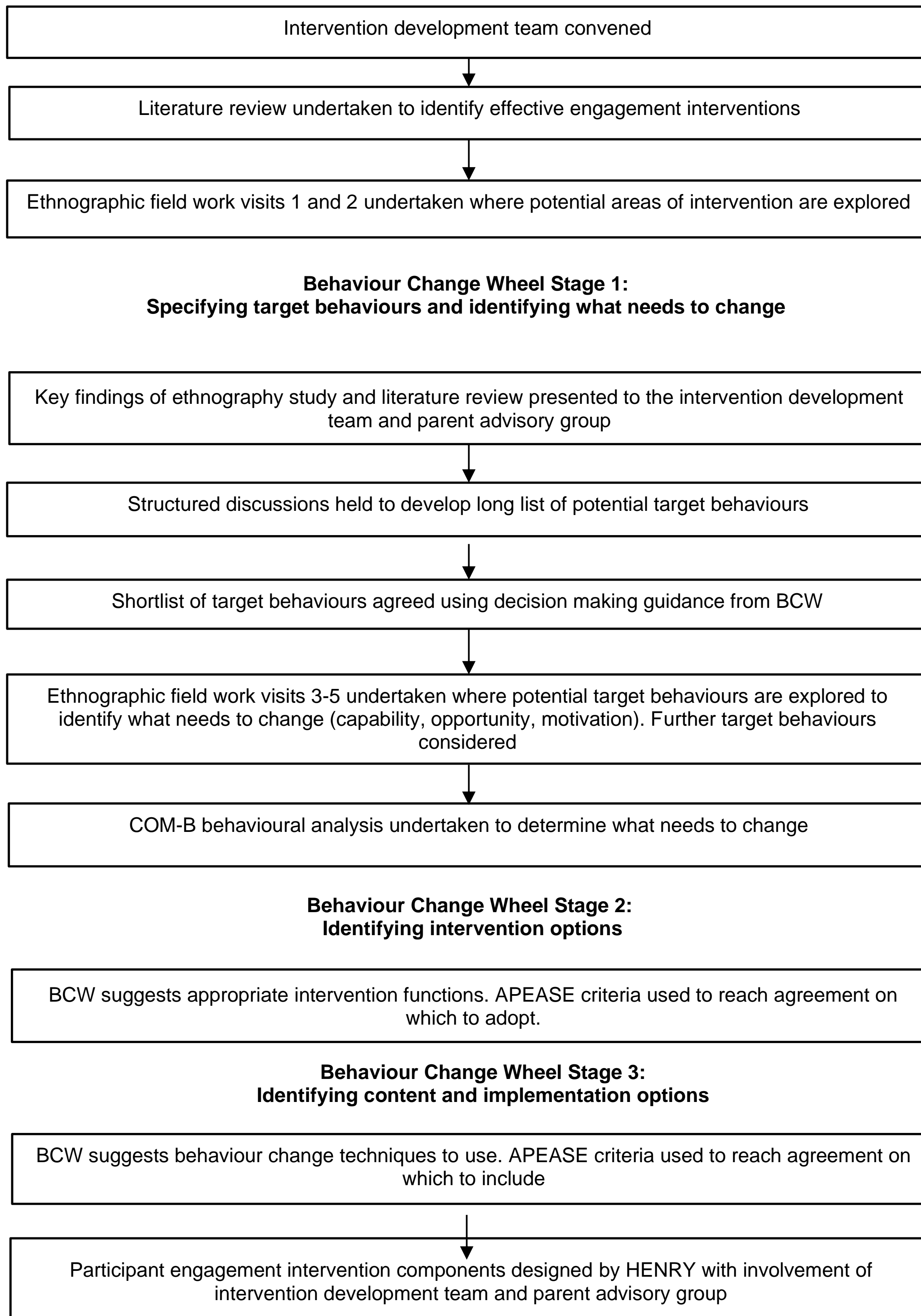


Figure 4.6 Process used to develop participant engagement intervention

4.2.3 Stage One methods: Understanding the problem

4.2.3.1 Defining the problem in behavioural terms

During intervention development meetings, emerging results of the ethnography study (Chapter three) were discussed amongst the team, who used their experience and expertise to interpret the findings and define the research problem in behavioural terms. That is, defining in behavioural terms why some children's centres struggled to engage parents with HENRY when others did not. This was revisited throughout the intervention development process as further ethnographical visits occurred to ensure that later findings supported earlier assumptions.

4.2.3.2 Selecting the target behaviours

Once the research problem had been defined, a 'long list' of target behaviours was developed to address the problem, for example, providing training on HENRY to children's centre staff to improve their knowledge so that they could more accurately portray the programme to potential parents. The results of the ethnography study, literature review (Chapter two), experience and expertise of the intervention development team and ideas from the parent advisory group were drawn upon to develop the list.

Once the long list of behaviours had been developed, the BCW provided guidance on how to prioritise the behaviours to target in the intervention, since trying to do too much too quickly is less likely to be effective (Michie et al., 2011). This involved the team having structured discussions to categorise each potential target behaviour as: 'promising', 'very promising', 'unpromising' but 'worth considering' and 'unacceptable'. Categorisation was performed by considering how much impact each potential behaviour would have on the desired outcome (i.e., increased parent engagement), the likelihood that the behaviour could be changed, the likelihood that changing that behaviour could have a positive or negative 'spill-over' to other behaviours, and consideration of how easy it would be to measure the behaviour change.

Following this process, many of the target behaviours were still deemed as promising. Therefore, the team performed a ranking exercise (outside of the BCW approach) to narrow the list down further. Each team member selected their top ten behaviours, assigning a score between one and ten. More or less than ten behaviours could be selected if necessary. Scores were collated to produce an overall top ten which were put forward as the final behaviours to be included. Where a team member felt strongly that additional behaviours should be added, these were also considered, and agreement on whether or not to include was

reached amongst the team. As this stage of the process occurred after just two ethnography visits; subsequent ethnographical findings that resulted in further potential behaviours being identified were considered via the same criteria (e.g.,'promising' or 'very promising') and consensus was reached regarding whether to include or not. The wider literature on engagement was also drawn upon to consider what might have the potential to work.

4.2.3.3 Specify target behaviour

Once the shortlist of target behaviours was agreed, the following were specified for each behaviour: (1) the individual that will perform the behaviour, (2) what the individual needs to do differently to perform the behaviour and (3) when they will do it.

4.2.3.4 Identifying what needs to change

The COM-B model of behaviour was used to understand which behavioural component (capability, opportunity or motivation) would need to change for target behaviour to occur. To inform this process, target behaviours (e.g., providing training on HENRY for staff) were discussed with children's centre stakeholders during later ethnography study visits. During which, stakeholders were asked for their perceptions of whether capability, opportunity or motivation would need to be changed for the target behaviour to occur. Relevant excerpts of the resulting ethnographical data were deductively coded according to the capability, opportunity or motivation constructs for each target behaviour. The results of this process were presented to the intervention development team who used their experience and expertise to support and provide further insight into the findings.

4.2.4 Stage Two methods: Identifying intervention options

Once the stage above had established what needed to change for the target behaviours to occur (capability, opportunity or motivation), the BCW provided guidance on *how* to change the behaviour by proposing potential intervention functions that were most likely to work: education, persuasion, incentivisation, coercion, training, restriction or environmental restructuring. Each potential function was considered against APEASE criteria (Affordability, Practicability, Effectiveness, Acceptability, Side effects and Equity) during structured group discussions, until consensus was reached on which to incorporate in the intervention design. At this stage in the BCW, there is also the option to consider the development of policies to support the intervention but this was considered beyond the remit of the intervention.

4.2.5 Stage Three methods: Identifying content and implementation options

Once the intervention functions had been agreed, the BCW provided guidance on potential behaviour change techniques (BCT) to use in the intervention to bring about change from the behaviour change technique taxonomy (v1) (Abraham and Michie, 2008). Agreement on which to include was again reached using APEASE criteria by the intervention team. Once the BCTs had been agreed, the team decided how the intervention would be implemented in terms of what the intervention components would look like, when they would be delivered and who would design and deliver them. The parent advisory group were also consulted to discuss the design of some of the intervention components (see section 4.3.4)

4.3 Results

4.3.1 Stage One results: Understanding the problem

4.3.1.1 Defining the problem in behavioural terms

The ethnography study revealed that the factors influencing parent engagement with HENRY were present across multiple levels of the children's centre context, with local authority buy-in influencing children's centre implementation of the programme. The ethnography study also provided insight into practices that were likely to promote engagement with HENRY (e.g., the provision of HENRY training for centre staff involved in promoting the programme). Although the benefits of those practices were widely accepted amongst local authorities and children's centres, many stakeholders described barriers to performing them such as restricted budgets. Therefore, the problem of *why* some children's centres struggled to engage parents with HENRY was defined in behavioural terms as: *children's centre stakeholders do not perform behaviours that are likely to promote parent engagement despite their acknowledged benefits.* As such, the overarching aim of the participant engagement intervention was to: *encourage children's centre stakeholders to perform behaviours that are likely to promote engagement*.

4.3.1.2 Selecting and specifying the target behaviours

In order to promote engagement with HENRY, the findings of the ethnography study recognised that the participant engagement intervention needed to change behaviours at multiple hierarchical levels throughout the children's centre context. Therefore, the intervention aimed to change behaviours at the following levels: local authority commissioners, children's centre managers, children's centre staff, HENRY facilitators and previous participants of the HENRY programme. A long list of 37 target behaviours was developed by the intervention development team. This included effective ~~the~~ participant engagement interventions identified in Chapter Two (literature review): financial incentives, text message reminders and reduced time commitment (shortened programme length). The long list of behaviours was narrowed down to a list of 27 by categorising behaviours as 'very promising', 'promising', 'unpromising' but 'worth considering' and 'unacceptable' (Table 4.1). This ruled out reduced time commitment and financial incentives, as they were considered unpromising in their potential to increase parent engagement, likelihood of the behaviour being changed and the likelihood of the behaviour change having wider impact. The list of 27 potential behaviours were then narrowed down to a final shortlist of 11 target behaviours during the ranking exercise performed outside of the BCW approach. Text messages reminders (suggested from the literature review) were discounted here due to anticipated logistical barriers. However, the list did include facilitators following up participants by phone if they missed a session. The final list of behaviours, specified according to 'who', 'what', 'when' is detailed in Table 4.2, along with the rationale for including each behaviour.

4.3.1.3 Identifying what needs to change

Table 4.3 presents the outcome of the behavioural analysis which identified whether capability (physical or psychological), opportunity (physical or social) or motivation (reflective or automatic) needed to be influenced for each target behaviour to occur.

Table 4.1 Long list of target behaviours

	Who to perform behaviour	Likelihood of increasing parent engagement	Likelihood of changing behaviour	Likelihood of having wider impact	Measurability of behaviour change	Possible target behaviour? (very promising or promising overall)
	Parent level					
1.	Volunteer to be HENRY peer recruiter	Very promising	Promising	Promising	Promising	Yes
	Staff level					
2.	Promote HENRY accurately to dispel myths and negative perceptions	Very promising	Promising	Promising	Promising	Yes
3.	Attend training to learn more about HENRY	Promising	Promising	Promising	Promising	Yes
4.	Encourage parents to discuss barriers to engaging at so they may be resolved	Promising	Promising	Promising	Promising	Yes
	Facilitator level					
5.	Make parents feel comfortable/at ease during group sessions	Very promising	Very promising	Promising	Promising	Yes
6.	Take responsibility/leadership for engaging parents and staff with HENRY	Promising	Promising	Promising	Promising	Yes
7.	Consider characteristics of group/individuals and adapt approach of delivery of sessions	Promising	Promising	Promising	Promising	Yes

	Who to perform behaviour	Likelihood of increasing parent engagement	Likelihood of changing behaviour	Likelihood of having wider impact	Measurability of behaviour change	Possible target behaviour? (very promising or promising overall)
8.	Allow enough time in sessions for parents to discuss feelings and issues and enable group bonding	Promising	Promising	Promising	Promising	Yes
9.	Follow up on people who miss a session to address barriers	Very promising	Promising	Promising	Promising	Yes
10	Send text message reminders ahead of each group session	Promising	Promising	Promising	Promising	Yes
	Manager level					
11	Plan HENRY programmes well in advance and run on a regular basis	Very promising	Promising	Very promising	Very promising	Yes
12.	Adopt HENRY approach throughout the whole centre	Very promising	Promising	Very promising	Very promising	Yes
13.	Promote HENRY widely using a variety of strategies inside and outside of the centre	Very promising	Very promising	Very promising	Very promising	Yes
14.	Allow time to for staff to attend training	Very promising	Promising	Promising	Very promising	Yes
15.	Allow places on programmes for self-referred parents to ensure a mix of targeted and self-referred parents	Very promising	Unpromising but worth considering	Very promising	Very promising	Yes
16.	Deliver taster session prior to each programme	Very promising	Very promising	Very promising	Very promising	Yes
17.	Allow parents to attend HENRY from outside of catchment area	Unpromising but worth considering	Promising	Unpromising but worth considering	Unpromising but worth considering	No

	Who to perform behaviour	Likelihood of increasing parent engagement	Likelihood of changing behaviour	Likelihood of having wider impact	Measurability of behaviour change	Possible target behaviour? (very promising or promising overall)
18.	Attend core training to learn more about HENRY	Promising	Promising	Promising	Promising	Yes
19.	Provide translator in HENRY sessions if needed as appropriate	Promising	Unpromising but worth considering	Unpromising but worth considering	Unpromising but worth considering	No
20.	Develop strategies to engage parents not already engaged with centre e.g. Facebook page	Promising	Unpromising but worth considering	Unpromising but worth considering	Unpromising but worth considering	No
	Commissioner level					
21.	Provide increased funding for facilitator and core training	Promising	Promising	Promising	Promising	Yes
22.	Attend stakeholder events as arranged by HENRY to learn more about HENRY	Promising	Promising	Promising	Promising	Yes
23.	Provide additional funding/support for managers to promote engagement	Promising	Promising	Promising	Promising	Yes
24	Offer financial incentive to parents to enrol	Unpromising but worth considering	Unpromising but worth considering	Unpromising but worth considering	Promising	No
	HENRY level					
25.	Hold regular stakeholder events across the country	Promising	Promising	Promising	Promising	Yes
26.	Provide data to commissioners and managers more regularly and on time	Very promising	Very promising	Promising	Very promising	Yes

	Who to perform behaviour	Likelihood of increasing parent engagement	Likelihood of changing behaviour	Likelihood of having wider impact	Measurability of behaviour change	Possible target behaviour? (very promising or promising overall)
27.	Incorporate weaning into HENRY programme	Unpromising but worth considering	Unpromising but worth considering	Unpromising but worth considering	Unpromising but worth considering	No
28.	Develop and distribute guidance for staff to support parent recruitment as an alternative/back-up/refresher to core training	Very promising	Promising	Promising	Promising	Yes
29.	Translate course material to different languages	Promising	Unpromising but worth considering	Promising	Unpromising but worth considering	No
30.	Reiterate that HENRY recruitment should be universal and not targeted to managers	Promising	Promising	Promising	Promising	Yes
31.	Simplify parent textbook	Worth considering	Unpromising but worth considering	Unpromising but worth considering	Promising	No
32.	Provide promotional material to centres on a regular basis so they don't need to develop their own inaccurate material	Very promising	Very promising	Very promising	Promising	Yes
33.	Revise branding and marketing approach	Very promising	Very promising	Very promising	Very promising	Yes
34	Reduce paperwork for parents i.e. questionnaires	Worth considering	Worth considering	Worth considering	Promising	No
35.	Support peer recruitment and develop toolkit	Promising	Promising	Promising	Promising	Yes
36.	Run national HENRY campaign	Very promising	Unpromising but worth considering	Unpromising but worth considering	Promising	No

	Who to perform behaviour	Likelihood of increasing parent engagement	Likelihood of changing behaviour	Likelihood of having wider impact	Measurability of behaviour change	Possible target behaviour? (very promising or promising overall)
37	Shorten programme length so not as big a commitment	Unpromising but worth considering	Unpromising but worth considering	Unpromising but worth considering	Promising	No

Table 4.2 Short list of target behaviours

	Who	What	When	Rationale	Informed by
1.	Local authority commissioner	Support managers to perform target behaviours	Ongoing from the start of the intervention period	Local authority support for HENRY programme is likely to influence centre level practices	Ethnography study findings and the implementation science literature e.g. Klein and Sorra (1996)
2.	Children's centre manager	Hold 'taster' sessions prior to each HENRY programme	Prior to each delivered HENRY programme	Potential participants are more likely to engage if they have a greater understanding of what the programme entails	Experience of HENRY personnel, ethnography study finding (observation) and the literature e.g. Gilbert et al. (2017)
3.	Children's centre manager	Increase HENRY training provision for centre staff	From the start of the intervention period	Some children's centre staff lack knowledge of the HENRY programme and would benefit from training on the HENRY approach	Ethnography study (interviews and observation), experience of team members and the literature e.g. Davis et al. (2012) and Blaine et al. (2017)
4.	Children's centre manager	[i] Hold HENRY programmes regularly and [ii] plan HENRY programmes far in advance	Ongoing from the start of the intervention	Some HENRY programmes are planned at short notice which hinders recruitment efforts	Ethnography study (informal conversations) and experience of intervention development team
5.	Children's centre manager	Promote HENRY widely in centres using a range of methods	Ongoing from the start of the intervention	There is a general lack of awareness of HENRY among visiting parents	Ethnography study (observations, informal conversations and parent focus groups)

	Who	What	When	Rationale	Informed by
6.	Children's centre manager	Allow a mix of referred and self-referred parents to enrol	Ongoing from the start of the intervention	Delivering programmes to a mix of parents (referred and self-referred) reduces barriers associated with stigma and improves group dynamics	Ethnography study (interviews and observations) and the literature (Bloomquist et al., 2013)
7.	Children's centre manager and staff	Adopt a whole centre approach to HENRY; whereby [i] HENRY principles are adopted in other programmes and [ii] all staff are involved in the implementation of HENRY.	Ongoing from the start of the intervention	Adopting a whole centre approach to HENRY implementation achieves better outcomes for engagement	Ethnography study (observations and informal conversations) and experience of the intervention development team
8.	Children's centre staff	Promote HENRY accurately to dispel myths and negative perceptions.	Ongoing from the start of the intervention	Misconceptions around what HENRY entails may deter people from engaging	Ethnography study (interviews, observations, focus group and informal interviews)
9.	HENRY facilitators	Ensure parents feel comfortable when attending the session by [i] considering characteristics of the parents before they attend and [ii] giving them enough time in sessions for group discussion.	During all HENRY programmes	The skills of facilitators are known to influence engagement	Ethnography study (observation, focus groups and interviews) and the literature e.g. Owens et al. (2007a) and Beatty and King (2008)
10.	HENRY facilitators	Follow up on all parents that miss a session to encourage continued attendance	During all HENRY programmes	Participants feel valued if they are followed up after missing a session	Ethnography study (focus groups) and experience of the intervention development team.

	Who	What	When	Rationale	Informed by
11.	Previous HENRY participants	Encourage friends and family to engage with HENRY	Following HENRY programme attendance	Parent are more likely to attend a programme if they know someone that has attended before	Ethnography study (interviews and focus groups) and the literature e.g. Gross et al. (2001) and Friars and Mellor (2009)

Table 4.3 COM-B behavioural analysis to identify what needed to change for behaviours to occur

Intervention level	Target behaviours	The COM-B construct that need to be influenced for target behaviours to occur.		Would need to be influenced for behaviour change to occur	Potential intervention function suggested by BCW
Commissioner	Support managers to adopt target behaviours	Capability (psychological)	Commissioners need greater understanding of HENRY outcomes to facilitate decision making around level of support they are willing to provide	✓	Education, training or enablement
		Opportunity (physical)	Strict budgets exist around how much money can be invested into participant engagement efforts	Maybe	Training, restriction, environmental restructuring, enablement
		Motivation (reflective)	Motivation of commissioners need to be increased before additional resources are invested into participant engagement efforts	✓	Education, persuasion, incentivisation, coercion
Managers	Hold taster sessions prior to each HENRY programme Increase HENRY training provision for centre staff Hold HENRY programmes regularly and plan far in advance Promote HENRY widely within Centre using a range of methods Allow a mix of referred and self-referred parents to enrol	Capability (psychological)	Managers are already capable of performing the behaviours	*X*	N/A
		Opportunity (social)	Managers need support from commissioners before investing greater resources into parent engagement efforts	✓	Restriction, environmental restructuring, modelling, enablement
		Motivation (reflective)	Prior to investing greater resources into HENRY, manager motivation would need to be increased to find ways around restricted budgets and reduced staff capacity.	✓	Education, persuasion, incentivisation, coercion

Intervention level	Target behaviours	The COM-B construct that need to be influenced for target behaviours to occur.		Would need to be influenced for behaviour change to occur	Potential intervention function suggested by BCW
	Adopt a whole centre approach to HENRY; whereby [i] HENRY principles are adopted in other programmes and [ii] all staff are involved in the implementation of HENRY.				
Children's centre staff	Promote HENRY accurately to dispel myths and negative perceptions of HENRY	Capability (psychological)	Children's centre staff often do not have the relevant capacity to perform the behaviours due to a lack of training	✓	Education, training or enablement
		Opportunity (Social)	Staff would require adequate social support from managers and team members to perform the behaviours, along with physical resources to assist with promoting the programme	✓	Restriction, environmental restructuring, modelling, enablement
		Motivation (reflective)	The motivation of some staff members would need to be increased in order for them to learn and implement new practices	✓	Education, persuasion, incentivisation, coercion
HENRY facilitators	Ensure parents feel comfortable when attending the session by (i) considering characteristics of the parents before they attend and (ii) allowing enough time in sessions for group discussion. Follow up on all parents that miss a session to encourage continued attendance	Capability (psychological)	Some facilitators may lack the relevant capability to perform the behaviours e.g., due to lack of experience	✓	Education, training or enablement
		Opportunity (physical)	A lack of time may present barriers to facilitators' performing the behaviours	✓	Training, restriction, environmental restructuring or enablement
		Motivation (reflective)	The motivation of some facilitators could be increased in order for them to invest additional time to HENRY planning	✓	Education, persuasion, incentivisation, coercion

Intervention level	Target behaviours	The COM-B construct that need to be influenced for target behaviours to occur.		Would need to be influenced for behaviour change to occur	Potential intervention function suggested by BCW
HENRY parents	Encourage friends and family (peers) to engage with HENRY	Capability (psychological)	Previous participants of HENRY have the relevant capacity to be able to recruit their peers.	*X*	N/A
		Opportunity (physical and social)	The relevant physical resources would need to be provided in order for previous participants of HENRY to recruit their peers. In addition, social support from centre managers would also need to be influenced so that parents feel positive that their peers would be eligible and welcome to attend	✓	Training, restriction, environmental restructuring or enablement
		Motivation (reflective)	Previous participants of HENRY that have enjoyed the programme would be motivated to recruit their peers. However, some may worry about causing offense, by inferring that the family/child needed to attend an obesity prevention programme	✓	Education, persuasion, incentivisation, coercion

4.3.2 Stage two: Identifying intervention options (intervention functions)

Intervention functions were selected at each level of the intervention (commissioners, managers, staff, HENRY facilitators and HENRY parents) in order to influence capability, opportunity or motivation as detailed in Table 4.3. This began with local authority commissioners, whose target behaviours were proposed to have a cascading effect on behaviours at the other levels.

Commissioners

In order to influence the 'capability' of commissioners to support manager adoption of target behaviours, the intervention aimed to 'enable' them to make informed decisions around the level of resource that should be invested in engagement efforts. Based on the ethnography data it was felt that this would be achieved by providing them with data on the outcomes achieved by families that attend. The intervention would also 'persuade' commissioners to support engagement efforts by informing them of the expected benefits (e.g., greater cost effectiveness and reach of the programme).

Managers

By gaining the support of local; authority commissioners, the intervention proposed to 'enable' managers to perform the target behaviours by influencing their 'opportunity' (i.e., by providing financial, organisational or social support). Further, manager motivation would be influenced by 'persuading' them why it was beneficial to adopt the behaviours (e.g., that more families would benefit from attending the programme).

Centre staff

Adoption of the target behaviours at the manager level was proposed to 'enable' children's centre staff to promote HENRY accurately by providing them with the required 'social opportunity' to do so, by supporting a culture in which HENRY practices were embedded throughout the centre and providing 'training' in the HENRY approach to increase their 'psychological capability' (knowledge or skills required to perform behaviours). The intervention also aimed to 'enable' staff to promote HENRY accurately by providing them with the relevant resources. Staff would also be 'persuaded' to perform the behaviours by providing information on how families that attend HENRY benefit from the programme.

HENRY facilitators

The capability and opportunity of HENRY facilitators would be influenced by providing 'training' to perform the target behaviours. The motivation of facilitators would also be influenced by 'persuading' them how the behaviours would benefit HENRY participants.

HENRY parents

HENRY parents (previous participants of HENRY) would be 'enabled' to promote HENRY to their peers by influencing their opportunity to do so via centre manager and facilitator support ('social opportunity'). Resources would be provided to 'enable' them to perform the behaviour ('physical opportunity'). Motivation to perform the behaviour would be influenced by 'educating' them on the benefits of peer recruitment.

4.3.3 Stage three: Identifying content and implementation options

The behaviour change techniques selected by the intervention development team to deliver each intervention function are outlined in Table 4.4, along with the associated intervention component. HENRY national office was responsible for producing final intervention materials and providing training to local authority HENRY coordinators who implemented the intervention within their areas.

Table 4.4 Behaviour change techniques selected for inclusion in the participant engagement intervention

Intervention level	Intervention function	Behaviour change technique	Detail	Intervention component
Commissioner	Enablement	12.5 Adding objects to the environment	Provide data on how HENRY benefits families that attend to guide decision making around HENRY investment	Commissioner report
	Persuasion	5.6 Information on social consequences	Provide information on the benefits of promoting engagement with HENRY, how HENRY aligns with national public health targets and the benefits to families that attend	Commissioner leaflet and report
Managers	Persuasion	5.6 Information about social and environmental consequences	Provide information on the benefits of adopting target behaviours along with information on how HENRY benefits families that attend.	Manager information day and dashboard report
		2.7 Feedback on outcome of behaviour	Provide feedback on how many parents enrolled and attended the HENRY programme	Dashboard report
		1.4 Action planning	Encourage managers to plan how they will implement target behaviours	Manager information day
		1.3 Goal setting	Encourage managers to set a goal for how often/to what degree they will implement target behaviours	Manager information day
Children's Centre staff	Enable	12.5 Adding objects to the environment	Provide resources to enable children's centre staff to promote HENRY accurately	Promotional material
	Persuasion	5.6 Information about social and environmental consequences	Provide information on how HENY benefits families that attend	Dashboard report
HENRY facilitators	Training	4.1 Instruction on how to perform the behaviour	Advise HENRY facilitators on how to perform target behaviours	Facilitator refresher training

Intervention level	Intervention function	Behaviour change technique	Detail	Intervention component
		6.1 Demonstration of the behaviour	Demonstrate how to perform target behaviours	Facilitator refresher training
	Persuasion	5.6 Information about social and environmental consequences	Provide information on the benefits of adopting the target behaviours	Facilitator refresher training
Parents that have attended HENRY	Enablement	12.5 Adding objects to the environment	Provide resources to enable HENRY parents to recruit their peers	Promotional material
	Education	5.6 Information on social consequences	Provide information on the benefits of adopting peers	Information provided by HENRY facilitator

4.3.4 Participant engagement intervention components

The resulting HENRY participant engagement intervention was developed to include six components: (1) commissioner report, (2) commissioner overview leaflet, (3) dashboard report, (4) manager information workshops, (5) HENRY facilitator refresher training and (6) revised promotional material.

Commissioner report

As described in Chapter Three (ethnography), prior to the development of the participant engagement intervention, HENRY central office were supposed to circulate a report to local authority commissioners after each HENRY delivery period (typically in line with school terms), which reported on outcomes achieved by families that attended the most recent programmes delivered in their area. This report included data on outcomes including changes in parenting self-efficacy, family eating habits and intake of fruit and vegetables, from the start to the end of the programme. However as described in the ethnography chapter, some commissioners said that they were not aware of receiving these data or did not receive data at the appropriate times. This made it difficult to use the data to inform decision making about HENRY investment. Therefore, this intervention component proposed that during the intervention period, reporting procedures would be tightened so that all local authorities in the intervention arm would receive the report on time.

Commissioner overview leaflet

A HENRY overview leaflet was the method used to provide information to commissioners on the aims of the project along with information on the benefits of promoting engagement with HENRY (i.e., increased reach and sustainability), and the benefits of delivering taster sessions, providing additional training for staff, implementing peer recruitment and adopting a universal rather than targeted approach to recruitment. The information provided in the leaflet was agreed by the intervention development team, with HENRY central office producing the final material (Appendix 5). The leaflet was circulated to all commissioners in the intervention arm by HENRY at the start of the intervention period.

Dashboard report

A new HENRY outcome dashboard report was developed to provide feedback to managers on how many parents they enrolled and retained in the previous delivered programme, along with a summary of the outcomes achieved by families that attended, including changes to lifestyle behaviours (Appendix 6). Key outcomes included in the report were agreed by the intervention development team as being most relevant to managers, thus having the best chance of persuading them to perform target behaviours. The team agreed that the report should be circulated at the start of the participant engagement intervention so they could reflect on how well they performed at baseline (the start of the trial), and after each delivered programme so that they would have access to the data in a timely manner to identify potential areas for improvement for the subsequent programme. Managers were encouraged to circulate the dashboard to staff working in the centre so that they could also be informed of how HENRY benefits the families that attend. HENRY central office was responsible for producing the report and circulating it at the appropriate times.

Manager information workshop

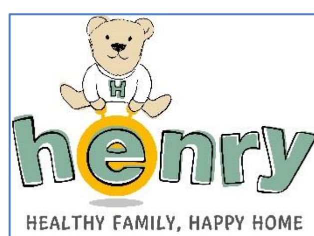
Manager information workshops were designed to be attended by all managers within a local authority that delivered HENRY in their centre. Workshops were planned to introduce managers to the participant engagement intervention and target behaviours they were encouraged to perform. The intervention development team set out ways in which specified behaviour change techniques could be applied in the workshop (e.g., incorporating group goal setting and action planning activities). HENRY central office produced the final session plan to ensure that the delivery style of the workshop was consistent with the HENRY approach (e.g., offering groups rewards and using a solution focused approach) to ensure sustainability of workshops beyond the study period if successful. During the implementation period, the workshops took place over half a day at the start of the intervention and comprised group discussions and activities based around the target behaviours. This provided the opportunity for managers to knowledge share and problem solve around how they may implement the behaviours in their centres (See Appendix 7 for workshop overview). The workshops were delivered by local HENRY coordinators who had received relevant training from central HENRY office.

Facilitator refresher training

Facilitator refresher training workshops were designed to train and persuade facilitators to perform target behaviours. Similar to manager workshops, the intervention development team set out ways in which the behaviour change techniques could be delivered in the workshop. Final session plans were produced by HENRY to ensure that delivery style was consistent with existing training methods, and so sustainable. At the start of the implementation period, HENRY facilitators were invited to attend the half-day refresher training workshop delivered by their local HENRY coordinator. During the workshop, facilitators were instructed to introduce peer recruitment to participants of HENRY during their final HENRY session, along with describing the expected benefits (See Appendix 8 for workshop overview).

Revised promotional material

Existing promotional material used by centres to promote HENRY was revised so that it more accurately reflected the holistic nature of the programme. For example, promoting more of the parenting side of the programme rather than the healthy eating elements, which was revealed as the most appealing and supportive element of the programme during the ethnography study and by the parent advisory group. Revision of the promotional material included the replacement of the tagline displayed on all promotional material from ‘Health, Exercise and Nutrition for the Really Young’ to ‘Healthy Family, Happy Home’:



This task was achieved by holding a workshop with the parent advisory group. Which included a brainstorming exercise on what HENRY meant to them (for those that had attended a programme in the past), or what would appeal to them (for those that had not attended a programme in the past). The parent advisory group and intervention development team came up with ideas for HENRY on the types of images that should be displayed on the promotional material to more accurately reflect the programme and be inclusive to all parents visiting the centres (e.g., including images of dads in the promotional material). The revised promotional material was also designed to support centre staff to promote HENRY accurately and provide a resource for HENRY parents to recruit their peers.

4.3.5 Logic model of participant engagement intervention

During the development of the participant engagement intervention, a logic model was developed to describe how the intervention was proposed to promote parent engagement with HENRY. This was an iterative process performed by the PhD candidate in discussions with the rest of the team (Figure 4.7).

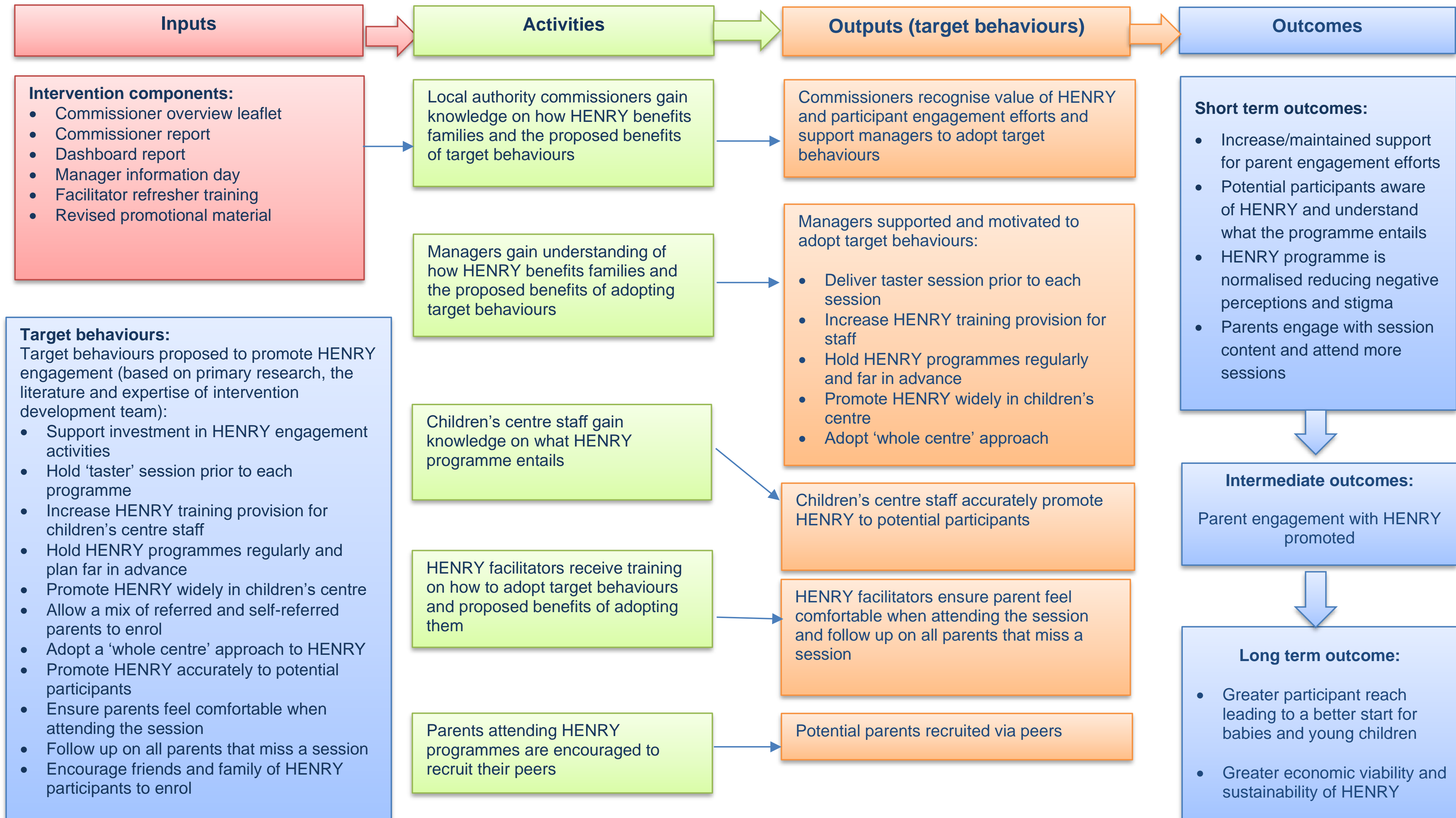


Figure 4.7 Logic model of participant engagement intervention

4.4 Discussion

The participant engagement intervention was aimed at changing behaviours across the children's centre context to promote parent engagement with HENRY. By drawing on the data obtained during the ethnography study and the experience of the multi-disciplinary team, a rich understanding was gained of why some centres struggled to engage parents with HENRY. Facilitated by the BCW approach, target behaviours were then selected to address this problem, and the behavioural components that needed to be influenced for the target behaviours to occur were established. Understanding which behaviours need to change to achieve a specific goal, and why, before attempting to change them (termed formative research (Higgins et al., 1996)) is regarded as key for achieving intervention success (Merzel and D'Afflitti, 2003, Young et al., 2006). Therefore, by following the BCW approach, the participant engagement intervention offered potential to promote parent engagement with HENRY.

The process of shortlisting target behaviours according to the expected ease of changing the behaviour, impact of the behaviour change and likely 'spill-over' effect (from commissioners down to parents), enabled target behaviours to be selected that were achievable and likely to have a positive impact on parent engagement. The application of APEASE criteria to select intervention functions and behaviour change techniques also promoted a pragmatic approach which ensured the intervention was feasible to implement within the timescales and resources of the study. In addition, suggested engagement activities were deliverable within existing infrastructure and resources of the children's centre context making them more likely to receive organisational support and continue beyond the intervention period (May et al., 2016). Yoong et al. (2019) also used APEASE criteria independently of the behaviour change wheel approach to adapt an existing intervention aimed at improving the implementation of a healthy canteen policy in schools. The authors were mindful that the adapted intervention needed to be delivered within the constraints of the end users to enable implementation practices to be sustained over time. Their intervention activities included training workshops together with audit and feedback activities to gain the support of executives and staff, bearing similarities to the current intervention. Yoong et al. (2019) reported significant increases in policy compliance and adoption of principles, confirming the potential of the HENRY participant engagement intervention.

In the literature, there are few examples of interventions aimed at changing implementation practices within children's centres. However, one identified example, adopted a similar approach to the participant engagement intervention in order to promote implementation of fire prevention guidelines in children's centres (Deave et al., 2014). Deave and colleagues' intervention involved providing staff and managers with information on the importance of preventing fire-related injuries along with offering guidance on how they could support families to adopt fire prevention behaviours. A cluster randomised trial of the intervention reported significant change in the behaviours of managers and staff (Deave et al., 2017). However, in contrast to the participant engagement intervention, their intervention included research facilitation support, whereby the research team supported implementation of the intervention, in addition to supporting managers and staff to adopt target behaviours. Therefore, given the amount of support that was offered by the research team, it is unlikely that this intervention would have been sustainable beyond the research period.

During the development of the participant engagement intervention, the BCW approach did present some challenges. The COM-B model of behaviour underpinning the intervention development was difficult to apply to an intervention that aimed to change behaviours across multiple hierarchical levels. As previously mentioned, BCW guidance recommends that few target behaviours should be selected within an intervention to prevent it from trying to do too much at once (Michie et al., 2011). Yet, in order to change behaviours at the staff level for example, behaviours at the commissioner and manager levels also need to be changed, thus increasing the number of behaviours that need to be targeted. If using implementation theory to inform the intervention design, such as implementation climate theory (Klein and Sorra, 1996) as described in Chapter Three, the intervention may have focused only on promoting buy-in at the commissioner level, assuming that increased efforts into HENRY engagement would logically result. But using this theory alone, may have neglected to consider the behaviours of all individuals involved in implementation of HENRY, ~~since~~, for example we know how important HENRY facilitators are influential over participant engagement. This strengthens the need to utilise a combination of theories (e.g. implementation and behavioural) when designing an intervention. But, as previously described, the BCW does not offer guidance on how this might be applied. Band et al. (2017) successfully utilised both the BCW and Normalisation Process Theory to develop an intervention to promote self-management of hypertension. They drew upon both theories when considering what needed to

change, so that constructs from both could be addressed within the intervention design. Unfortunately, this study was published after the development of the participant engagement intervention, so could not serve as an exemplar.

4.4.1 Strengths and Weaknesses

The main strength of the process used to develop the participant engagement intervention was the transparent and systematic process facilitated by the behaviour change wheel approach. In addition, the in-depth formative research enabled target behaviours to be identified via first-hand observations or stakeholder engagement (children's centre stakeholders, intervention development team and parent advisory group). This resulted in logical assumptions being made of how parent engagement with HENRY might be increased. The novel, multi-level nature of the participant engagement intervention was also a strength, which aimed to change behaviours across multiple layers of the children's centre hierarchy in order to support activities that were proposed to promote parent engagement.

A recognised limitation of the process used to develop the intervention is that more individuals that would ultimately receive the intervention were not involved in the intervention design. This could have enabled theoretical assumptions to be confirmed by people directly involved in HENRY implementation. However, this was somewhat mitigated by the involvement of children's centre stakeholders that were involved in the ethnographical research, intervention development team and parent advisory group. Similarly, a feasibility and/or piloting stage was not undertaken prior to the final design of intervention components. This might have highlighted weaknesses in the design that would have been addressed prior to implementation. Given the limited timelines and resources within the PhD, this was not feasible.

4.5 Conclusion

This chapter described how the participant engagement intervention was developed. The intervention aimed to encourage stakeholders involved in HENRY implementation to adopt a set of behaviours that were proposed to promote engagement with HENRY. The next chapter describes the methods used to evaluate the intervention.

Chapter Five: Cluster randomised controlled trial and process evaluation methods

5.1 Introduction

Chapter Four outlined the development of a participant engagement intervention aimed at promoting engagement with HENRY. A national cluster randomised controlled trial testing the effectiveness of the intervention was undertaken outside of the PhD, led by Dr Bryant (PhD supervisor). This chapter describes the methods used to undertake a process evaluation that was nested within the trial. The chapter begins by outlining Medical Research Council (MRC) guidance for process evaluation research (Moore et al., 2015). Potential frameworks and theoretical perspectives are then discussed before providing a description of the approach used here. The aim of the process evaluation was to explore the 'theory of change' and provide explanation of the trial results. Research objectives were informed directly by the selected approach, therefore, these are set out at the end of the introduction.

5.1.1 MRC guidance on process evaluation research

Process evaluations seek to provide answers as to why interventions succeed or fail (Craig et al., 2006). The use of process evaluations alongside rigorous outcome evaluation is advocated by MRC to explore implementation, contextual factors and programme theory to determine their attributability to evaluation outcomes (Moore et al., 2015). This provides valuable information as to whether an intervention is appropriate for scaling up and allows Type III error to be avoided, whereby researchers reject an intervention that has been poorly implemented (Basch et al., 1985). Although randomised controlled trials are the gold standard for outcome evaluation, process evaluations are needed to interpret the findings (Oakley et al., 2006).

The Medical Research Council released guidance in 2015 on how to plan, design, conduct and analyse process evaluations (Moore et al., 2015). The guidance suggests that key to all process evaluations is establishing how interventions are implemented (e.g. fidelity, dose and reach), the influence of contextual factors and the nature of causal mechanisms that lead to impact (Figure 5.1). The wide range of theoretical approaches and methods available to draw upon are also highlighted. As the potential breadth of exploration is wide, the guidance encourages researchers to narrow down the focus of enquiry to identify the most important research questions, as informed by gaps in the literature, key

uncertainties around the logic model, the need for replication of results and priority questions posed by policy and practice stakeholders.

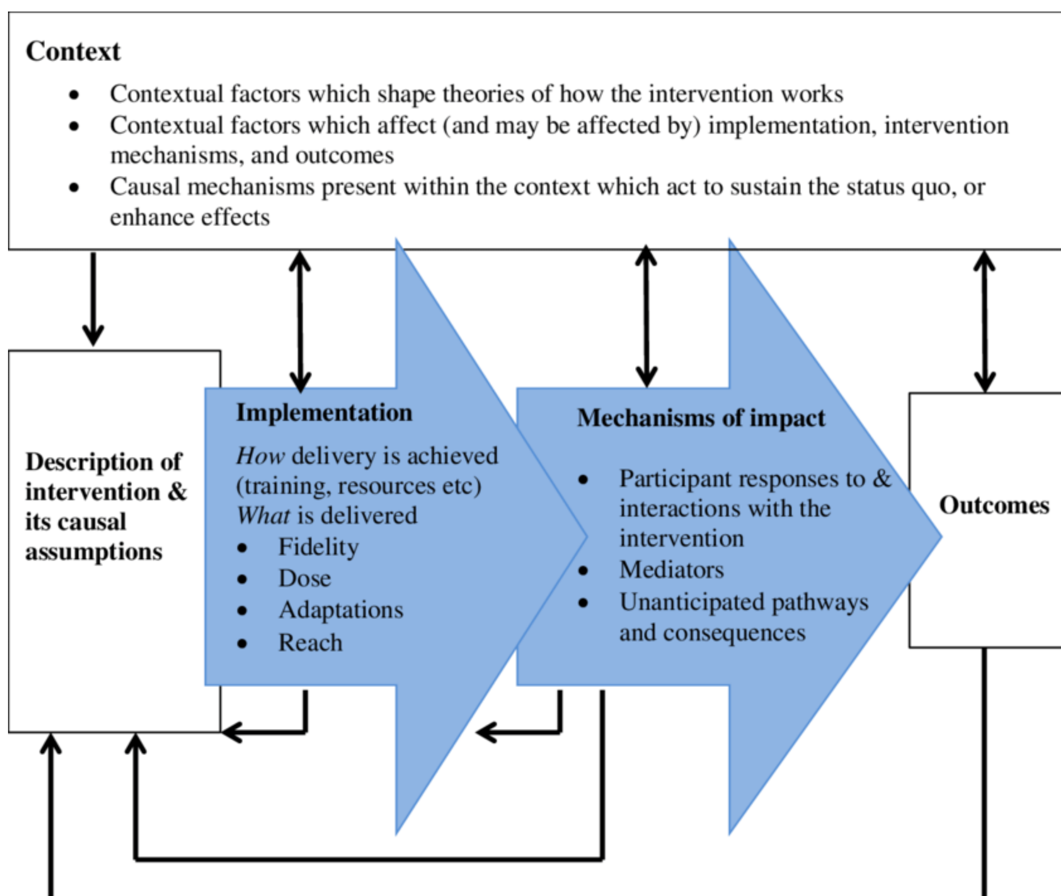


Figure 5.1 MRC guidance process evaluation framework

5.1.2 Process evaluation frameworks

Process evaluation frameworks and theoretical approaches vary in their emphasis of research. Some centre on describing the extent to which interventions are implemented as planned (Baranowski, 2000, Steckler and Linnan, 2002) or focus on describing the influence of contextual factors on causal mechanisms and outcomes (Pawson and Tilley, 1997). Others aim to explore or test underpinning assumptions and theory (Weiss, 1997, Baron and Kenny, 1986). However, more than one can be drawn upon to serve the function of the research (Moore et al., 2015). An understanding of the most relevant frameworks and approaches was sought to decide on which to use for the process evaluation of the HENRY participant engagement intervention. MRC guidance offers suggestions of frameworks to use to measure implementation, context and mechanisms of impact. Those considered most suitable for meeting the aims of the current study included: Process Evaluation Framework, (Steckler and Linnan, 2002), Fidelity

Framework (Carroll et al., 2007), Realist Evaluation (Pawson and Tilley, 1997) and the Theory Based Evaluation approach (Weiss, 1997). Some frameworks suggested by MRC guidance which were discounted before being closely considered include Diffusion of innovations (Rogers, 1962),which is better suited to evaluating the implementation of programmes that are implemented on a wide scale, and Mediation analysis (Baron and Kenny, 1986) which requires a large volume of quantitative data to be gathered to provide appropriate statistical power (Fritz and Mackinnon, 2007).

5.1.2.1 Process Evaluation Framework (Steckler and Linnan, 2002)

Steckler and Linnan's (2002) Process Evaluation Framework outlines key components to be assessed in any process evaluation: context, reach, dose delivered, dose received, fidelity, implementation and recruitment (Table 5.1). The framework was developed from a review of the literature in response to the rise in process evaluation research, and lack of consistency in reporting and terminology. Thus, their framework aimed to aid interpretation and transferability of process evaluation findings to better understand mechanisms of change and improve intervention effectiveness.

Table 5.1 Steckler and Linnan's (2002) Process Evaluation Framework

Construct	Definition
Context	Aspects of the larger social, political, and economic environment that may influence intervention implementation.
Reach	The proportion of intended target audience that participates in an intervention. If there are multiple interventions, then it is the proportion that participates in each intervention or component. It is often measured by attendance. Reach is a characteristic of the target audience.
Dose delivered	The number or amount of intended units of each intervention or each component delivered or provided. Dose delivered is a function of efforts of the intervention providers.
Dose received	The extent to which participants actively engage with, interact with, are receptive to, and/or use materials or recommended resources. Dose received is a characteristic of the target audience and it assesses the extent of engagement of participants with the intervention.
Fidelity	The extent to which the intervention was delivered as planned. It represents the quality and integrity of the intervention as conceived by the developers.
Implementation	A composite score that indicates the extent to which the intervention has been implemented and received by the intended audience.
Recruitment	Procedures used to approach and attract participants. Recruitment often occurs at the individual and organizational/ community levels.

Steckler and Linnan's Process Evaluation Framework is widely used in the literature and provides a rich understanding of how interventions are implemented, so that conclusions can be drawn around the relationships between the level of implementation achieved and intervention effect. This was successfully demonstrated in a study undertaken by Devine et al. (2012) whereby measurement of constructs within the framework established that a walking and healthy eating intervention delivered in a rural workplace achieved significantly greater outcomes when the intervention was delivered with greater dose and reach. Other examples in the literature have chosen to implement the framework in different ways, and some do not measure all constructs. For example, many studies choose not to calculate an implementation 'score' (e.g. Zaman et al. (2020), Steenaart et al. (2020), Roberts et al. (2018)). According to the framework, the implementation score is a composite measure of fidelity, dose delivered, dose received and reach. The authors state than an acceptable score is determined *a priori* to assess whether objectives have or have not been met (Steckler and Linnan, 2002). However, measurement of these constructs may be complex and not appropriate for all studies. For instance, implementation levels may differ between sites due to contextual factors, thus, exploring *why* differences exist may be more important than calculating an overall score. Moreover, defining whether interventions have a high or low implementation score may not be useful when comparing differing interventions, target populations or settings, where implementation expectations are likely to vary.

In the current process evaluation study, the construct of 'recruitment' was also less applicable. Recruitment, along with attendance outcomes, were the primary indicators of whether the participant engagement was effective, and were therefore the primary outcomes measured in the trial. Recruitment 'procedures' were also at the core of the intervention being tested, and therefore, did not need to be explored within the process evaluation. As such, use of constructs may vary according to the project.

5.1.2.2 Fidelity Framework (Carroll et al., 2007)

Carroll et al. (2007), designed a framework that emphasised the concept of implementation fidelity, to enable the "true" effect of an intervention to be understood (Carroll et al., 2007). From a review of the literature, Carroll et al. (2007) posited that previous frameworks designed to report intervention fidelity failed to explore all necessary components (i.e. content, coverage, frequency and

duration) along with potential moderators of fidelity (intervention complexity, facilitation strategy, quality of delivery and participant responsiveness). Carroll et al. (2007) also proposed relationships between the constructs and moderators, as illustrated in Figure 5.2.

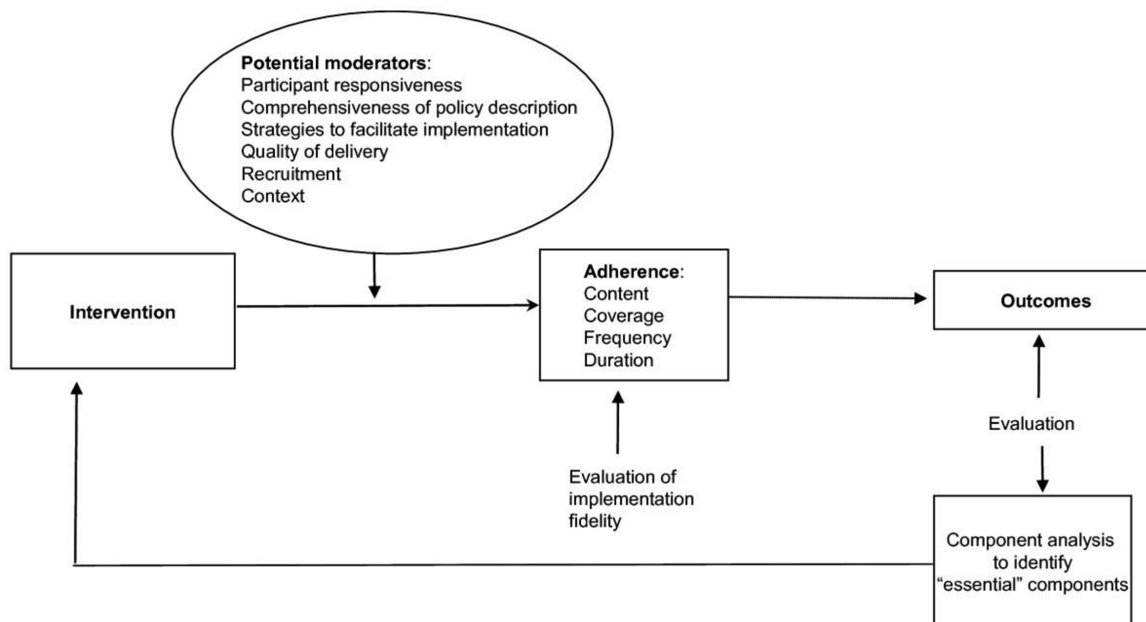


Figure 5.2 Relationship between implementation fidelity and intervention outcomes (Carroll et al., 2007)

The key concepts underpinning the Fidelity Framework are important. If there is misunderstanding around the way the intervention has been delivered, it can result in the aforementioned 'Type III error' (Basch et al., 1985). Moreover, understanding *why* interventions have not been delivered with fidelity allows potential breakdowns in implementation to be identified, which can be addressed and considered when deciding whether or not to upscale. Likewise, where an intervention has been delivered with high fidelity, researchers can be confident that the true intervention has been tested. Van der Laan et al. (2019) tested the effect of an intervention designed to improve medication adherence in community pharmacies, reporting no significant effect. Using the framework, they were able to establish that their intervention had been delivered with high fidelity and were therefore confident that the intervention failed due to reasons outside of its implementation. However, on its own, the framework can be limited. It fails to consider the influence of contextual factors beyond those directly affecting implementation and does not explore whether underpinning change mechanism are enacted as proposed. Therefore, the framework cannot offer definitive answers on why an intervention succeeds or fails but only whether or not it was

implemented as planned. A further limitation to the framework is the deductive approach used to explore moderators to fidelity (e.g., comprehensiveness of policy description, strategies to facilitate implementation and quality of delivery). By providing a list of potential moderators, other moderators outside of this list may not be explored. Moreover, the overall approach is mostly prescriptive, which may be appropriate for some studies where more is known about how the intervention is expected to work, but for interventions such as the HENRY participant engagement intervention, which are relatively novel, a more exploratory approach is needed to understand all aspects of the logic model.

5.1.2.3 Realist Evaluation (Pawson and Tilley, 1997)

Realist evaluation distances itself from describing whether interventions succeed or fail, but rather, seeks to identify what works for whom and it what circumstances (Pawson and Tilley, 1997). The approach aims to generate theory about how a specific population group interacts with an intervention within a given context. This differs from other theoretical approaches to evaluation that aim to test pre-defined theory underpinning an intervention (e.g. behavioural or social theory). Realist evaluations begin with the development of an 'initial theory' which is informed by exploration of the literature and consultation with stakeholders. An iterative process is then followed, whereby the initial theory is tested, before subsequent refinement of the theory followed by further testing, until the final stage has been reached (Tilley, 2000). The final stage comprises a series of context, mechanism, outcome (CMO) configurations (Table 5.2) that describe how an element of the intervention, or intervention as a whole, interacts with the context to produce a given outcome.

Table 5.2 Realist terminology (Pawson and Tilley, 1997)

Construct	Definition
Context	What conditions are needed for a measure to trigger mechanisms to produce particular outcomes patterns?
Mechanism	What is it about a measure which may lead it to have a particular outcome in a given context?
Outcome	What are the practical effects produced by causal mechanisms being triggered in a given context?

The realist approach focus on context, mechanism and associated outcome is interesting and logical. Dissecting an intervention in this way offers extensive understanding of what works for whom and under what circumstances. However, it is not clear how this information may be used and applied in broader use (e.g., understanding how the intervention might work in a different setting or population). This approach differs greatly from outcome evaluation studies (e.g. comparing intervention outcomes between intervention and control conditions), hence, there are few realist process evaluations nested within clinical trials in the literature. However, in one exemplar, Rycroft-Malone et al. (2018) conducted a realist process evaluation within a trial of two interventions aimed at promoting uptake of urinary care recommendations in care homes. The trial reported no significant effect for both interventions, and the results of the process evaluation offered insight into how a sample of care homes interacted with the intervention, potentially providing some explanation of the results. However, implementation of the intervention and the underpinning logic model were not explored, which could have also been relevant to the trial result. Therefore, although realist evaluations are important and insightful, in order to gain a comprehensive understanding of randomised controlled trial results, other approaches are also required that incorporate exploration of implementation outcomes and theoretical assumptions.

5.1.2.4 Theory Based Evaluation (Weiss, 1997)

Theory based evaluation is another theoretical approach to intervention evaluation. This approach uses an intervention's 'theory of change' or logic model as the basis for evaluation by testing proposed assumptions that are built into the programme. The aim of this approach is to identify which assumptions do, or do not hold to ensure the evaluation accurately reflects which programme activities are firmly connected to outcomes (Weiss, 1997). Included in the process is the development of the theory of change, whereby all underlying theories and assumptions are specified in as much detail as possible. As a minimum, this should include a description of intervention activity, proposed outputs and outcomes. Following by the development of the theory of change, data collection tools are devised that are best suited to testing these assumptions (Weiss, 1997)

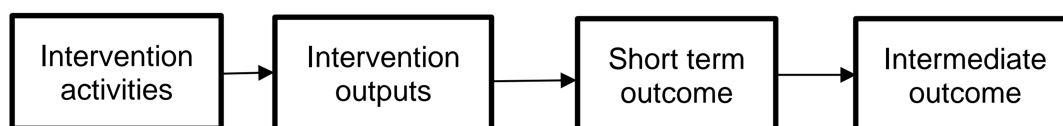


Figure 5.3 Essential components for theory of change

The main strength of the theory-based evaluation approach, along with realist evaluation, is the aim of understanding how interventions work, rather than just establishing the degree to which they are implemented. A further strength of theory-based evaluation, as opposed to realist evaluation, is the exploration of theoretical assumptions that underpin the intervention design. All interventions are underpinned by assumptions and theories regarding how they are proposed to work. Therefore, testing whether these assumptions and theories are correct rather than developing new theory about how the intervention works, allows the original intervention to be refined and better understood. Some examples in the literature have used the theory-based evaluation approach in conjunction with Steckler and Linnan's (2002) process evaluation framework to ensure that exploration of implementation and contextual factors receive adequate attention (e.g. Greenland et al. (2017)). This allows for implementation and context to be disentangled from causal assumptions so that breakdowns in the theory of change can be clearly identified.

5.1.3 Approach used for the participant engagement intervention process evaluation

As described in Chapter 4 (intervention development), the participant engagement was underpinned by a logic model which sets out how intervention activities were proposed to promote HENRY engagement. Therefore, the process evaluation of the participant engagement intervention aimed to explore whether the theory of change was enacted as proposed. To achieve this, a theory-based evaluation was undertaken, exploring change mechanisms, behaviour change, context and their influence on trial primary outcomes. Relevant constructs from Steckler and Linnan's (2002) framework were also used to assess implementation of the intervention (dose delivered, fidelity, reach). Due to the multi-level nature of the intervention, the potential scale of the study was large. Thus, although implementation of all levels of the intervention was assessed, detailed exploration of the theory of change was undertaken for just two intervention levels: the commissioner and manager levels. As described in Chapter Three and Chapter Four (ethnography and intervention development), it was proposed that commissioners and managers had the greatest influence on participant engagement with HENRY due to a hierarchical 'spill-over' effect. Therefore, behaviours at these levels were perceived to influence centre level implementation of HENRY, which, in turn, were proposed to influence parent perceptions and experience of HENRY. Hence, it was important to determine whether these

assumptions were correct to support the development of future interventions aimed at promoting engagement with a public health programme.

5.1.4 Research Objectives

The objectives of the HENRY participant engagement process evaluation were to:

1. Describe how all components of the intervention were implemented (dose delivered, fidelity, reach).
2. Explore whether change mechanisms proposed in the manager and commissioner level theories of change were enacted after receipt of the intervention.
3. Describe whether target behaviours were performed in participating local authorities and consider potential relationships between implementation and behaviour change.
4. Explore the influence of contextual factors on the theory of change.

This mixed methods process evaluation was structured around the underpinning theory of change. Figure 5.4 provides a simplified version of the logic model which includes all intervention activities, proposed change mechanisms and behaviour change outcomes at the commissioner and manager levels and trial primary outcomes.

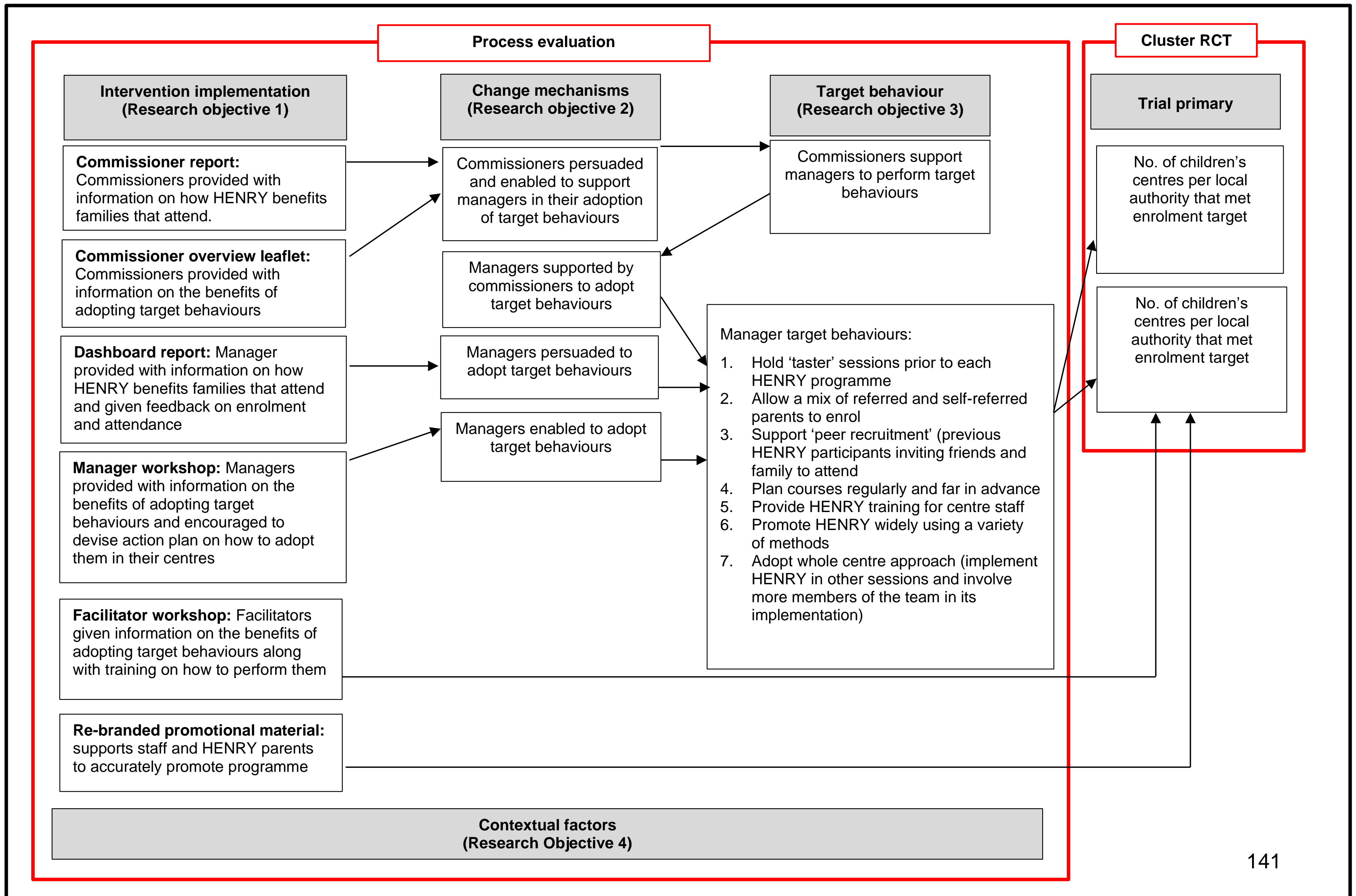


Figure 5.4 Participant engagement intervention theory of change explored in process evaluation

5.2 Methods: Cluster randomised controlled trial

The effectiveness of the HENRY participant engagement intervention was determined in a national cluster randomised controlled trial in work outside of the PhD (ClinicalTrials.gov Identifier: NCT02675699). This trial was led by Dr Bryant (PhD supervisor). The methods used for the trial are summarised below from the published protocol with permission (Bryant et al., 2017).

5.2.1 Trial design

This trial used a two-arm, multi-centre, cluster randomised trial (cRCT) design. Local authorities across England and Wales that delivered HENRY programmes were invited to take part. Those willing to participate were randomised in 1:1 allocation to deliver HENRY programmes with the support of the participant engagement intervention (HENRY + participant engagement: intervention) or continue with standard HENRY delivery alone (HENRY only: control). Local authorities that commission HENRY programmes routinely provide data for all delivered programmes on enrolment, attendance and parent outcomes, measured pre- and post-attending the programme (e.g. child fruit and vegetable intakes, family eating behaviours and parenting efficacy). These data were securely transferred to the University of Leeds (Clinical Trials Research Unit) for participating local authorities at baseline and follow up to measure engagement outcomes (see below).

5.2.2 Recruitment and consent

At the time of recruitment, 32 local authorities commissioned HENRY in the UK; within them, 317 children's centres delivered HENRY programmes. All local authorities/children's centres that provided outcome data within the two years prior to recruitment were invited to take part in the trial using an 'opt out' approach. A joint letter was sent to all commissioners and children's centre managers from the University of Leeds and HENRY providing information about the trial. In the letter, they were informed that routine data provided by them would be used in the analysis. Those that did not want to take part were given the opportunity to opt out by returning a form or emailing the trial team. If a local authority chose to opt out, the children's centres within it were not eligible to take part. Children's centres within local authorities that did take part could opt out independently if they wished.

5.2.3 Randomisation

Randomisation of local authorities was undertaken by a statistician at the clinical trials research unit at the University of Leeds. To ensure a balance between local authorities and children's centres in each arm, an algorithm for covariate constrained randomisation was used, based on: local authority baseline enrolment and attendance levels, the proportion of centres delivering at least one HENRY programme in 2016, the size of the local authority and children's centre area deprivation. Randomisation occurred after baseline data had been collected.

5.2.4 Intervention and control conditions

In the control arm (HENRY alone), children's centres continued to deliver HENRY programmes as per standard practice. In the intervention arm (HENRY + participant engagement intervention), children's centres continued to deliver HENRY programmes as per standard practice but also received the commissioner overview leaflet and report, manager dashboard report and re-branded promotional material and were invited to attend manager and facilitator workshops.

5.2.5 Outcomes

Anonymised routine data provided by HENRY was used to measure all trial outcomes. Two primary outcomes were used to measure effectiveness of the intervention. Firstly, the proportion of centres enrolling at least eight participants per programme (enrolment) and secondly, the proportion of centres with at least 75% of parents attending a minimum of five out of eight sessions per programme (attendance). The engagement intervention was considered effective if either enrolment or retention goals were met. Secondary outcomes were: the proportion of parents reporting that their child had increased their fruit and vegetable intake by at least 0.5 portions at the end of programme (derived from pre-and-post HENRY programme questionnaires as a proxy measure for parent compliance with the programme); the proportion of children's centres that achieved all targets for enrolment, attendance and increase in child fruit and vegetable intake; longitudinal impact on enrolment and attendance (as assessed in children's centres that provided data from more than one programme); and changes in parenting self-efficacy, family eating behaviours and child screen time (also derived from pre-and-post HENRY programme questionnaires).

5.2.6 Sample size

As all local authorities that delivered HENRY programmes were invited to take part, power calculations were undertaken by assuming the final sample, rather than using a sample size calculation. It was assumed that 25% of the 32 local authorities would decline participation or be ineligible. Therefore, calculations were based on 24 local authorities taking part (12 per arm). It was also estimated (based on HENRY data of the number of centres delivering programmes) that an average of six children's centres per local authority would take part, providing 144 children's centres (72 per arm). This was expected to provide at least 80% power to detect a 30% significant improvement in enrolment and attendance outcomes, if the intra-cluster correlation coefficient (ICC) was as high as 0.1, or at least 90% if the ICC was as high as 0.05.

5.2.7 Statistical analysis

Analyses were conducted using the intention to treat population (ITT). All trial analyses were undertaken by the trial statistician. A two-stage cluster-level analysis was performed that adjusted for stratification factors (baseline/pre-randomisation enrolment and attendance, children's centre area deprivation and local authority size). Logistic regression models were produced that adjusted for the stratification factors, and a t-test was performed to assess differences between local authority clusters for the primary outcomes of enrolment and attendance. Secondary outcomes were analysed using the same method (with the exception of family eating behaviours and longitudinal impact on enrolment and attendance). As the trial measured outcomes in the intention to treat population, those centres that did not deliver a HENRY programme during the trial were included in the analyses and were classified as not meeting enrolment and attendance targets.

5.2.8 Ethical approval

Ethical approval for the trial and process evaluation was granted by the School of Medicine Research Committee at the University of Leeds (MREC15-017).

5.3 Methods: Process evaluation

The process evaluation was nested within the cluster randomised controlled trial of the participant engagement intervention. Primary outcome data gathered for the trial (enrolment and attendance) were used to frame the results. Figure 5.5 provides an overview of data collection timelines. An overview of data collection methods are provided in Tables 5.3 - 5.6. Further details are provided below.

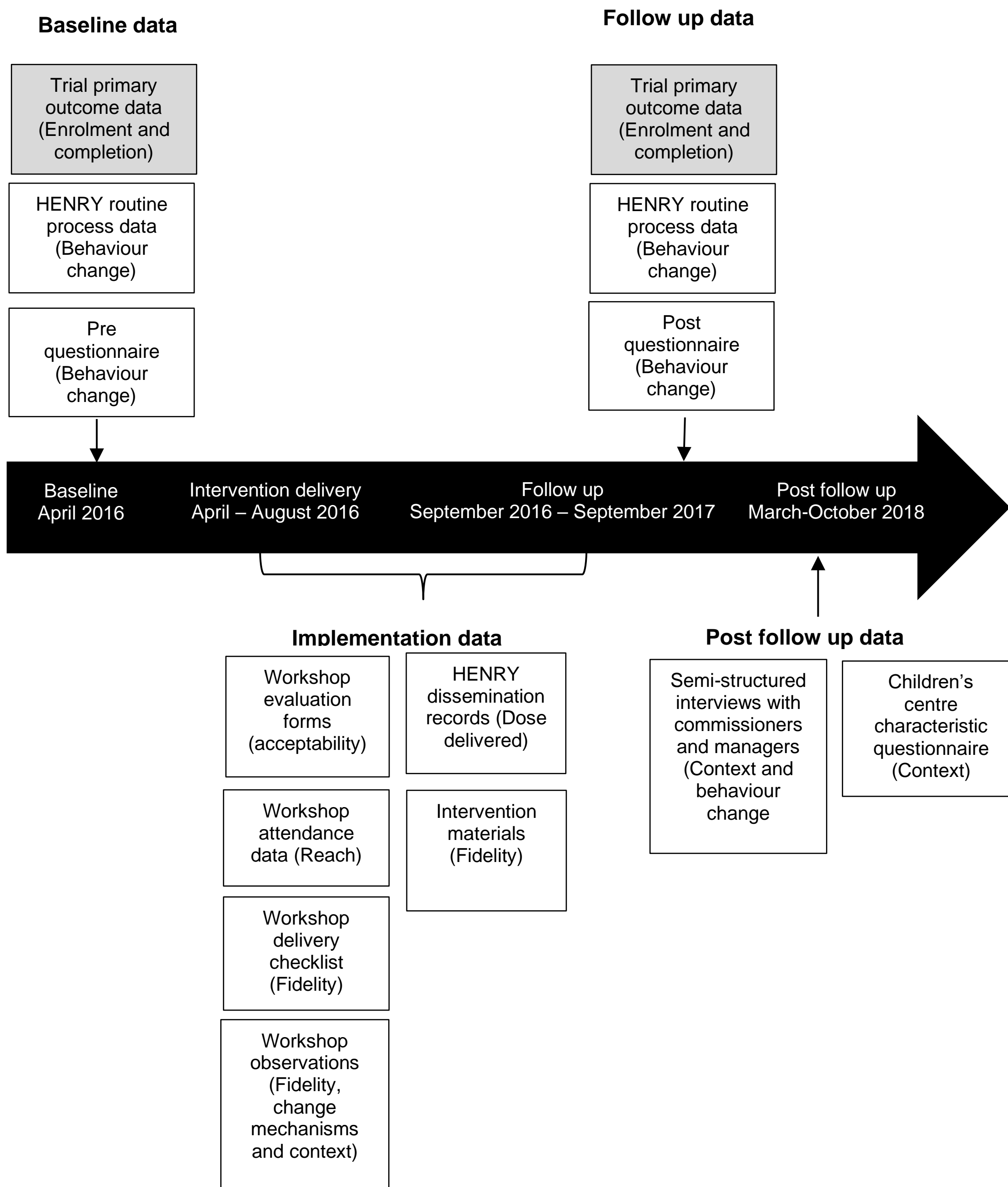


Figure 5.5 Data collection timelines

Table 5.3 Overview of methods for research objective 1: Implementation (of all levels of the intervention)

Intervention level	Intervention component	Implementation construct	Data type	Data source	Timepoint
Commissioner level	Overview leaflet	Dose delivered – the number of local authority commissioners that received the overview leaflet	Quantitative	HENRY central office distribution records - log of which areas were sent leaflet	Start of intervention delivery
		Fidelity (BCT incorporation) – the number of specified behaviour change techniques incorporated in the leaflet	Quantitative	Intervention materials – a copy of the leaflet compared with intervention specification	Follow up
	Commissioner report	Dose delivered – the number of timepoints the report was delivered (out of a possible three)	Quantitative	HENRY central office distribution records - log of which areas received the report and when	Start of intervention delivery and after each delivered HENRY programme
		Fidelity (BCT incorporation) – the number of specified behaviour change techniques incorporated in the leaflet	Quantitative	Intervention materials – a copy of the report compared with intervention specification	Follow up
Manager level	Manager workshop	Fidelity (BCT incorporation) – the number of specified behaviour change techniques incorporated in the workshop session plan	Quantitative	Intervention materials – a copy of the workshop session plan compared with intervention specification	Follow up
		Fidelity (delivery) – delivery of workshops in accordance to the session plan	Quantitative	Self-report fidelity checklist of session plan adherence (number of BCTs delivered) Validation of fidelity checklist via researcher observation	During delivery of workshops
		Reach – the number of managers in attendance at the workshops from participating centres	Quantitative	Workshop attendance register	During delivery of workshops

	Dashboard report	Dose delivered – the number of centres that received at least one report	Quantitative	HENRY central office distribution records - log of which areas were sent report and when	Start of intervention delivery and after each delivered HENRY programme
		Fidelity (BCT incorporation) – the number of specified behaviour change techniques incorporated in the report	Quantitative	Intervention materials – a copy of the report compared with intervention specification	Follow up
Facilitator level	Facilitator workshop	Fidelity (BCT incorporation) – the number of specified behaviour change techniques incorporated in the session plan	Quantitative	Intervention materials – a copy of the workshop session plan compared with intervention specification	Follow up
		Fidelity (delivery) – delivery of the workshops in accordance to the session plan	Quantitative	Self-report fidelity checklist of session plan adherence (number of BCTs delivered) Validation of fidelity checklist via researcher observation	During workshop delivery
		Reach – the number of facilitators in attendance at the workshops from participating centres	Quantitative	Workshop attendance register	During workshop delivery

Table 5.4 Overview of methods for research objective 2: Change mechanisms (at the commissioner and manager level)

Intervention level	Intervention components	Research question	Data type	Data source	Timepoint
Commissioner level	Commissioner overview leaflet and report	Was the leaflet and report acceptable and did they persuade commissioners to support manager performance of target behaviours?	Qualitative	Interview with local authority commissioners	Post follow up
Manager level	Dashboard	Was the dashboard report acceptable and did it persuade managers to perform target behaviours?	Qualitative	Interviews with centre managers	Post follow up
	Workshops	Was the workshop acceptable and did it enable and persuade managers to perform target behaviours?	Qualitative	Interview with centre managers	Post follow up
			Qualitative	Researcher observation of workshop	During delivery of workshops
			Quantitative	Workshop evaluation form	During delivery of workshops

Table 5.5 Overview of methods for research objective 3: Behaviour change (at the commissioner and manager levels)

Intervention level	Research question	Target behaviour	Data type	Data source	Timepoint
Commissioner level	Did commissioners perform target behaviour?	Support managers to perform target behaviours	Qualitative	Interview with local authority commissioners	Post follow up
Manager level	Did managers perform target behaviours?	Target behaviours: 1. Deliver taster session prior to each programme 2. Allow a number or referred and self-referred parents to enrol 3. Recruit via peer to peer recruitment 4. [i] Deliver more HENRY programmes	Quantitative	Routine data	Follow up
		Target behaviours: 4. [ii] Plan programmes far in advance 5. Provide HENRY training for centre staff 6. Promote HENRY using a variety of methods 7. Adopt whole centre approach (implement HENRY in other sessions and involve more members of the team in its implementation)	Quantitative	Pre and post questionnaire	Baseline and follow up

Table 5.6 Overview of methods for research objective 4: Context

Research question	Data type	Data source	Timepoint
How did context influence theory of change?	Qualitative	Observations of facilitator and manager workshops	During intervention delivery
	Qualitative	Interviews with local authority commissioners and children's centre managers	Post follow up
	Quantitative	Children's centre characteristic questionnaire	Post follow up

5.3.1 Data collection

5.3.1.1 Data collection methods for research objective 1: Implementation

As described in Chapter Four (intervention development), implementation of the participant engagement was undertaken by HENRY central office and local authority HENRY coordinators. Personnel at HENRY central office were responsible for designing the final intervention materials as specified by the intervention development process. Distribution of the commissioner overview leaflet, commissioner report and manager dashboard at baseline and during the trial was also the responsibility of HENRY central office. HENRY central office provided training to local authority HENRY coordinators on how to deliver workshops in their local areas. HENRY Coordinators were then tasked with organising and delivering the workshops in each local authority. HENRY coordinators were also responsible for ordering re-branded promotional material to be used within children's centres in their areas to promote the programmes.

Data sources for research objective 1: implementation (dose delivered, fidelity and reach)

As outlined in Table 5.4, dose delivered was measured by assessing the amount of intervention components that were delivered in each local authority. Fidelity was measured in two different ways. In the first instance, fidelity was assessed in terms of the number of behaviour change techniques incorporated into intervention materials specified during the intervention development process. Fidelity of workshop delivery was measured by assessing how many behaviour change techniques were delivered to workshop attendees from those specified in workshop session plans, using a self-report implementation checklist and researcher observations. As workshops were the only component of the intervention that

participants were required to attend, 'reach' of the workshops was measured by calculating the proportion of participants that attended from those who were eligible to attend. All implementation constructs were measured quantitatively.

Data collection procedures for research objective 1: implementation (dose delivered, fidelity and reach)

HENRY central office distribution records

As the commissioner overview leaflet, commissioner report, dashboard report and promotional material were developed and distributed by HENRY central office during the intervention, HENRY personnel were asked to use a spreadsheet developed by the PhD candidate to log which commissioners and managers were sent them and at which time point (reports were designed to be delivered at baseline and two times during follow up). At follow up, the spreadsheet was sent to the PhD candidate via a secure data transfer system.

Intervention materials

To assess whether intervention materials developed by HENRY incorporated behaviour change techniques as specified during the intervention development period a copy of the commissioner overview leaflet, commissioner report, dashboard report, and manager and facilitator workshop session plans were provided by central HENRY office to be reviewed and compared with the intervention specification (Chapter Four, Table 4.4) following their development. As described in Chapter Four (intervention development), support for the development of materials was provided by the intervention development team, but where potential gaps were identified in the final materials (i.e. where recommendations were not incorporated by HENRY), a decision was made not to intervene, so that the process evaluation could remain independent from the intervention delivery/implementation.

Self-report implementation checklist (self-report and researcher validation)

All workshop deliverers (HENRY coordinators) were asked to complete a self-report implementation checklist at the end of each manager and facilitator workshops (Appendix 9). This recorded which sections of the intervention (including behaviour change techniques) were delivered in accordance with the workshop session plans to measure fidelity of delivery. After completing the form, data were sent to the PhD candidate.

To validate self-report fidelity data, workshop observations also took place. Consent was sought from all workshop deliverers to allow the PhD candidate to be to be present (see Research Objective 2 for more details on workshop observations). In

workshops that were observed, the implementation checklist described above was also completed by the researcher to check for consistency of the data.

Workshop attendance data

To measure reach of manager and facilitator workshops, the number of attendees at each workshop was recorded by the workshop deliverer.

5.3.1.2 Data collection methods for research objective 2: Change mechanisms

Data sources for research objective 2: change mechanisms

To understand whether behaviour change techniques incorporated into commissioner and manager levels of the participant engagement intervention promoted the desired response, commissioner and manager responses to the intervention were explored in four different ways. Semi-structured interviews with commissioners and managers, researcher observations of manager workshops, manager workshop acceptability data and workshop evaluation forms (Table 5.5).

Data collection procedures for research objective two: change mechanisms

Semi-structured interviews with commissioners and managers

Interviews were held with commissioners and managers from local authorities in both arms of the trial (intervention and control). Interviews with commissioners and managers in the intervention arm sought to elicit how they responded to the intervention components. Specifically, whether receiving respective intervention components persuaded and/or enabled them to perform the target behaviours and why (See topic guide, Appendix 10). Their views on acceptability of the intervention were also sought to explore whether this influenced performance of target behaviours. In interviews with commissioners and managers in the control arm, intervention components were described, and they were asked how they would have responded had they received them and if they would have found them acceptable. Contextual factors in intervention and control arms that may have influenced the theory of change were also explored (see Research Objective 4: Context). As depicted in the data collection timelines overview (Figure 5.5), interviews were undertaken after the follow up period to allow time for stakeholders time to reflect on their experiences during the trial.

A purposive sampling (Emmel, 2013) method was used to identify which commissioners and managers should be invited to take part in interviews. The aim of the sampling frame was to ensure representation of local authorities and children's centres where participant engagement (HENRY enrolment and completion) had

either increased, decreased or stayed the same from baseline to follow up (Table 5.7). Primary outcome data gathered for the trial was used to inform the frame. The study aimed to interview 20 participants in the first instance with a view to holding further interviews if specific areas of interest were identified that warranted further exploration (e.g. if the intervention had any unintended consequences, or if specific target behaviours were adopted over and above others).

Commissioners and managers identified from the trial data were contacted by email and provided with a participant information sheet. Those who consented to take part were given the option of a telephone or face to face interview. Written informed consent was received prior to all interviews taking place. All interviews were audio recorded using an encrypted secure device. Following transcription and checking of the data, the recordings were deleted.

Table 5.7 Sampling frame for process evaluation interviews

	Commissioner from local authority where participant engagement increased during trial	Commissioner from local authority where participant engagement decreased during trial	Manager from children's centre where participant engagement increased during trial	Manager from children's centre where participant engagement increased during trial
Intervention	2	2	3	3
Control	2	2	3	3

Workshop observations

Researcher observations were undertaken in manager workshops, where permitted by the workshop deliverer. A non-participant observational approach was taken so as to not influence responses. In addition to assessing fidelity of delivery of the workshops, observations allowed the 'spirit' of the intervention to be understood; for example, the manner in which it was received, discussions that were held and levels of engagement (Moore et al., 2015). Observations provided insight into whether managers reacted positively or negatively to the suggested target behaviours and if they indicated that they were likely to perform them or not, and why. An observation prompt checklist was used to guide the observation process (Appendix 11). This included elements such as whether target behaviours were viewed positively/negatively and if managers describe anticipated barriers. Discreet notes

were made during the workshop, with more detailed notes written immediately afterwards.

All HENRY coordinators were contacted at the start of the intervention to request that their workshop be observed but were advised that this was not compulsory. In workshops where observation was permitted, all attendees of the workshop were notified of the researcher presence in advance and advised that anything they said, or did would be confidential. Managers were also given the option to 'opt out' of the observation if they wished and that anything they said or did would be omitted from the notes. At the start of the workshop, the researcher was introduced, and attendees were informed that that they should feel free to speak negatively, or positively, around any aspect of the intervention, overall study or HENRY.

Workshop evaluation form

To quantitatively assess acceptability of the workshops, an end of workshop evaluation form was developed. Questions included 'to what extent was attending the session worth your time?', 'what did you find most useful?' and 'to what extent can you apply the information received in your centre?' (Appendix 12).

5.3.1.3 Data collection methods for research objective 3: Behaviour change

Data sources for research objective 3: behaviour change

Qualitative assessment of whether commissioners supported manager performance of target behaviours was explored during interviews described in Section 5.3.1.2. Quantitative assessment of whether managers performed target behaviours was undertaken in two ways: anonymised routine process data provided by HENRY and pre- and post-manager questionnaires.

Data collection procedures for research objective 3: behaviour change

Routine process data on behaviour change outcomes

HENRY central office provided anonymised routine process data on the delivery of taster sessions (Target behaviour 1), enrolling a mix of referred and self-referred participants (Target behaviour 2) and recruiting participants via peer-to-peer recruitment (Target behaviour 3). These data were collated by HENRY after each delivered programme. The trial statistician handled and summarised these data per local authority for the purposes of the process evaluation.

The measurement of Target behaviour 4 [i]: plan courses regularly, was assessed by comparing the number of programmes delivered in 2015 (year of baseline activity data used for trial randomisation stratification factor) to the number of programmes delivered during the trial (September 2016 – August 2017).

Pre and post questionnaire

To capture performance of target behaviours where routine data were not available, a questionnaire was developed to determine whether children's centre managers changed their HENRY engagement practices (target behaviours) from baseline to follow up (Appendix 13). The questionnaire used Likert scale or numerical responses to gather data on: the length of time HENRY programmes were planned in advance (Target behaviour 4[ii]), the number of staff that attended core training (Target behaviour 5), the number of methods used to promote HENRY (Target behaviour 6), the frequency staff members outside of the immediate HENRY team who were involved in the implementation of HENRY, and the frequency that HENRY principles or practice were incorporated into other sessions (Target behaviour 7). The questionnaire was based on a self-assessment tool that is widely implemented in early year's settings in the USA to assess health and well-being practices (Benjamin et al., 2007). Questionnaires were emailed to all participating managers (intervention and control) at baseline and follow up.

5.3.1.4 Data collection methods for research objective 4: Contextual factors

Data sources for research objective 4: contextual factors

Contextual factors influencing enactment of the theory of change were explored qualitatively and quantitively via interviews with commissioners and managers and a children's centre characteristic questionnaire.

Data collection procedures for research objective 4: contextual factors

Interviews with commissioners and managers

During interviews with the sample of commissioners and managers described in Section 5.1.3. 2 (change mechanisms), questions were also directed at exploring contextual factors that may have influenced responses to the intervention and performance of the target behaviours during the trial.

Workshop observations

During workshops observations described in Section 5.1.3. 2 (change mechanisms), notes were made on any contextual factors that managers described as potentially acting as a barrier or lever to performing the behaviours. Observation notes from facilitator workshops were also used to identify local contextual factors that may have influenced the theory of change.

Children's centre characteristic questionnaire

To explore whether children's centre characteristics (e.g. number of staff working in the centres) may have influenced performance of target behaviours, a brief children's centre characteristics questionnaire was developed (Appendix 14), informed by questions used to profile centres as part of the national children's centre evaluation (Poole et al., 2015), and included: the number of staff working in the centres, HENRY delivery model (programmes delivered by internal or external teams) and whether the centre had experienced funding restrictions affecting HENRY delivery. The questionnaire was circulated to all managers (intervention and control) post follow up, attached to an email thanking them for their participation in the study. The timing of this implementation prevented it from coinciding with completion of the pre- and post-questionnaires to maximise return rates. Managers could return the questionnaire by email or post.

5.3.2 Data analysis

5.3.2.1 Analysis of research objective 1: implementation

Analysis of HENRY distribution records (dose delivered)

The distribution spreadsheet provided by HENRY was summarised to report: delivery of commissioner overview leaflet (Y/N), the number of times commissioner reports were delivered to each local authority, the number of centres that received at least one dashboard report, delivery of manager and facilitator workshops in each local authority (Y/N), and whether re-branded promotional materials were ordered for use in the study from each local authority (Y/N). These data were then summarised for each local authority.

Analysis of intervention materials (fidelity; BCT incorporation)

Behaviour change techniques specified for each intervention component during the intervention development process were used to inform a checklist that intervention materials which were compared against (see Table 5.8 for example). A value of 1 was given when a BCT given was incorporated, 0 if not incorporated and 0.5 if partially incorporated. This was a similar method to French et al. (2015) who used this approach to measure delivery of BCTs in an educational intervention for GPs. Discussions were held between the PhD candidate and supervision team to agree on whether the BCT was sufficiently incorporated or not (yes, no or partial). A cumulative score and percent value was then calculated for each intervention component.

Table 5.8 Example of BCT scoring for intervention materials

Number of BCTs specified	**BCT description**		**BCT incorporated** (Y=yes; N=no; P=partial)	**BCT score** (Y=1; N=0; P=0.5)
Intervention component: Commissioner overview leaflet				
5	5.6 Information on social consequences	Written information on the consequences of delivering HENRY programmes	Y	1
		Written information on the consequences of delivering taster sessions	P	0.5
		Written information on the consequences of allowing a mix of referred and self-referred parents	Y	1
		Written information on the consequences of providing additional HENRY training for staff	Y	1
		Written information on the consequences of utilising peer recruitment	Y	1
Total score				4.5 / 5 (90%)

Analysis of implementation checklist (fidelity: delivery of workshops)

Similar to the above, implementation checklists were developed from the workshop session plans to assess whether sections of the workshops, which contained the BCTs, were delivered. As above, where BCTs were delivered as planned, a score of 1 was assigned if delivered, 0 was assigned if not delivered, and 0.5 assigned if partially delivered. An overall score and percentage of BCTs delivered were calculated for workshops delivered in each local authority (see table 5.9 for example).

Table 5.9 Example of BCT scoring for fidelity of delivery of manager workshops

BCT	Session content	Local authority ID		
		1 (Yes=1; No=0; Partial=0.5)	**2** (Yes=1; No=0; Partial=0.5)	**3** (Yes=1; No=0; Partial=0.5)
5.6 Information on social consequences	Information provided on the consequences of delivering taster sessions prior to each HENRY programme	1	1	1
	'How to' activity on adopting a whole centre approach to HENRY	0	1	1
	Information on the consequences of increasing the provision of HENRY core training for staff	0	1	0.5
Total		1 / 3 (33.3%)	3 / 3 (100%)	2.5 / 3 (83.3%)

Analysis of workshop attendance data (reach)

Reach of workshops was assessed by calculating the percentage of participants that attended workshops from the eligible population (i.e., the number of managers and facilitators that did attend compared with the number of participating centres).

5.3.2.2 Analysis of research objective 2: change mechanisms

Deductive analysis of interview data (responses to the intervention)

Following transcription of commissioner and manager interviews, all transcripts were uploaded onto Nvivo software (QSR International Pty Ltd, 2014) and organised into case folders. Prior to analysis, each transcript was reviewed to provide familiarisation of the data, and notes were made on initial thoughts around key concepts. A deductive analysis approach (Reichertz, 2014) was used to explore responses to the intervention components. During the deductive analysis process, Nvivo 'coding nodes' (coding labels), were prepared in advance using concepts informed by the theory of change (Figure 5.4). For example, data describing whether managers delivered taster sessions following their attendance at manager workshops were assigned to the code, 'delivery of taster sessions'. Data within each code were compared between participants and local authorities to identify patterns that either supported or refuted the theory of change. A sub-section of data was second coded by Dr Twiddy (PhD supervisor) to ensure trustworthiness of the analysis (Archibald, 2015).

Deductive analysis of workshop observational data (responses to the intervention)

All observational notes made during manager workshop observations were typed up and uploaded onto NVivo (QSR International Pty Ltd, 2014). These data were handled and analysed in the same manner as interview data (i.e. deductively coded according to the predefined themes).

Analysis of workshop evaluation forms (acceptability of workshops)

Responses for each item on the workshop evaluation forms were combined for all respondents. Median scores and interquartile ranges were calculated and presented for each questionnaire item.

5.3.2.3 Analysis of research objective 3: behaviour change

Analysis of routine data (target behaviours 1-4 [i])

Using routine data from the most recent HENRY programme prior to follow up, the following were summarised by trial arm and by local authority by the trial statistician: the number of centres that delivered a taster session, the number of centres allowing a mix of referred and self-referred participants to enrol and the number of centres that enrolled parents via peer-to-peer recruitment.

Analysis of pre and post questionnaire (target behaviours 4 [ii]-7)

Questionnaire responses were compared from baseline to follow up for each respondent. Where the value increased from baseline to follow up, it was assumed that the target behaviour had been performed by the children's centre manager. Where the value decreased or stayed the same, it was assumed that the target behaviour had not been performed (see Table 5.10 for example). A binary variable of Y/N was used to record whether each manager performed each target behaviour. The number of children's centres performing the behaviour within each local authority was summarised using Microsoft excel (Microsoft 365 MSO).

Table 5.10 Example coding of responses on pre- and post-questionnaire

Questionnaire item 1: In the past 12 months, HENRY programmes were usually planned in advance approximately (0= less than one week; 5=more than 12 months)				
Local authority ID	**Children's centre ID**	**Baseline score**	**Follow-up score**	**Performance of target behaviour**
Local authority 1	Children's centre 1	2	4	Y
Local authority 1	Children's centre 2	4	4	N
Local authority 1	Children's centre 3	4	0	N
Number of centres within local authority that performed target behaviour				1 centre

5.3.2.4 Analysis of research objective 4: contextual factors

Inductive analysis of interview data (context)

To explore contextual factors influencing responses to the intervention along with the broader theory of change, interview data gathered for Research Objective 2 were reanalysed, using inductive thematic analysis. In contrast to deductive analysis, inductive analysis involves codes and themes being developed from the data (Braun and Clarke, 2006). Once again, the transcripts were reviewed to allow familiarisation of the data and for initial thoughts to be noted on key concepts. Key words, phrases or sections of data were then assigned an 'initial code' which reflected the content and nature of the data; for example, 'funding constraints', 'staff capacity' or 'value placed on HENRY'. In the next stage, initial codes were reviewed to identify patterns between the codes and to group those that were similar, or discard those that were redundant or irrelevant. Codes were then combined into themes that encapsulated overarching concepts. See Table 5.11 for example. Themes were then reviewed against the transcripts to ensure they provided a true reflection of the data, and that all participants' perceptions and experiences were represented. A sub-section of data was second coded by Dr Twiddy (PhD supervisor) before the final themes were agreed. Themes were then finalised and defined, and the data within them compared, contrasted and summarised.

Table 5.11 Example of theme and code structure and supporting quote

Theme	Code	Supporting quote
Organisational change and reduced funding	Reduced staffing	*"Our team's capacity has been cut over the last sort of 4-5 years*."
	Job losses	*"By the end of 2015-2016 they were just starting to get rid of managers left, right and centre so unfortunately I don't think HENRY was probably top of their radar"*

Inductive analysis of workshop data (context)

As above, all notes gathered during observations of the workshops were handled and analysed alongside interview transcripts using inductive thematic analysis to identify contextual themes.

Analysis of children's centre characteristics questionnaire (context)

Questionnaire responses from children's centre characteristic questionnaires were summarised per trial arm for each question (e.g., the number of respondents in the intervention arm that indicated that their children's centre was part of a cluster). Key disparities in the responses were highlighted to bring attention to differences between the centres that may have influenced enactment of the theory of change.

Chapter Six: Results from the cluster randomised controlled trial and process evaluation

6.1 Overview of Chapter

This chapter begins by summarising the results of the cluster randomised controlled trial of the HENRY participant engagement intervention. The results of the process evaluation are then provided which offer explanation of the trial results and describe whether the theory of change was supported. The key findings of the process evaluation are then discussed before consideration of implications for future research.

6.2 Cluster randomised controlled trial of the participant engagement intervention: Results

As described in Chapter Five (methods), the primary outcomes measured in the trial were: the difference between arms for enrolment and attendance levels at follow up. All trial analyses were undertaken by the trial statistican at the Clinical Trials Reseach Unit at the University of Leeds. Publication of this work is currently under review.

6.2.1 Recruitment

Of the 37 initial local authorities eligible to take part, ten (27%) had ceased commissioning HENRY and were no longer eligible, and seven (19%) opted out. The remaining 20 local authorities (54%) including 126 children's centres were recruited to the trial. Ten local authorties were allocated to deliver HENRY programmes with the support of the participant engagement intervention (intervention) and ten were allocated to continue HENRY programmes alone (control). Baseline characteristics of the local authorities are provided in Table 6.1.

Table 6.1 Baseline characteristics of participating local authorities (Table taken from trial results paper with permission)

	Intervention (n=10)	Control (n=10)	Total (n=20)
Number of children's centres	61	65	126
Proportion of children's centres meeting the recruitment target of at least 8 parents per programme			
Mean (SD)	0.6 (0.3)	0.5 (0.3)	0.5 (0.3)
Proportion of children's centres meeting the attendance target of at least 75% parents attending 5/8 sessions per programme			
Mean (SD)	0.5 (0.3)	0.5 (0.3)	0.5 (0.3)
Proportion of children's centres running at least one HENRY programme in 2015			
Mean (SD)	0.8 (0.3)	0.7 (0.3)	0.7 (0.3)
Size of local authority			
Less than the median number of children's centres per local authority	5 (50.0%)	5 (50.0%)	10 (50.0%)
More than the median number of children's centres per local authority	5 (50.0%)	5 (50.0%)	10 (50.0%)
Proportion of children's centres in the most deprived quintile			
Mean (SD)	0.6 (0.3)	0.6 (0.4)	0.6 (0.3)
Proportion of children's centres in the least deprived quintile			
Mean (SD)	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)

6.2.2 Primary outcome data

Follow up data were gathered from programmes delivered from 1st September 2016 to 30th August 2017. Just 26 out of 61 children's centres in the intervention arm delivered a programme, and 26 out of 65 centres in the control arm. Children's centres that did not deliver a programme were included in the primary and secondary analyses, and were deemed as not meeting enrolment and attendance targets.

6.2.3 Primary analysis

Enrolment and attendance levels at follow up did not differ between arms (Table 6.2). Therefore, the participant engagement intervention was not considered to be effective at promoting participant engagement with HENRY.

6.2.4 Secondary analysis

Consistent with primary outcome findings, there were no differences between groups for the secondary outcomes of: the proportion of parents reporting that their child had increased their fruit and vegetable intake by at least 0.5 portions; the proportion of children's centres that achieved all targets for enrolment, attendance and increase to child fruit and vegetable intake; longitudinal impact on enrolment and attendance; and changes in parenting self-efficacy, family eating behaviours and child screen time.

Table 6. 2 Primary outcomes: pre-randomisation proportions, outcome proportions and risk difference adjusted for stratification factors (Taken from trial results paper with permission)

	Pre-randomisation[a] (%)	Unadjusted model estimates[b] Outcome (%)	RD (95% CI)	p-value	Adjusted model estimates[bc] RD (95% CI)	p-value	ICC
Primary outcome 1: Enrolment							
HENRY alone (n=10 local authorities)	50.0	18.0	-0.3 (-19.1, 18.6)	0.978	-1.2 (-19.5, 17.1)	0.886	0.136
HENRY + Participant engagement intervention (n=10 local authorities)	60.0	17.8					
Primary outcome 2: Attendance							
HENRY alone (n=10 local authorities)	50.0	13.9	3.1 (-13.3, 19.6)	0.695	1.2 (-15.7, 18.1)	0.881	<0.001
HENRY + Participant engagement intervention (n=10 local authorities)	50.0	17.1					

[a]Calculation of outcomes used data provided for randomisation

[b]Calculation of outcomes used data from the most recently delivered HENRY programme during follow-up at 18 months post randomisation

[c]Variables controlled for in the adjusted analyses were as follows: proportion of Children's Centres recruiting at least 8 parents per programme at randomisation, proportion of Children's Centres retaining at least 75% of parents for a minimum of 5/8 sessions per programme at randomisation, proportion of Children's Centres running at least one HENRY programme in 2015, size of local authority, proportion of Children's Centres in the least / most deprived quintile as ranked by the 2015 Index of Multiple Deprivation at the Lower Layer Super Output Area

Abbreviations: RD, risk difference; CI, confidence interval; ICC, intra-cluster correlation coefficient

6.2.5 Local authority level enrolment and attendance

To explore potential differencs in enrolment and attendance levels at baseline and follow up between local authorities, trial data were used to compare the number of centres meeting enrolment and attendance targets.

6.2.5.1 Enrolment

In all local authorities (intervention and control), the number of centres meeting the enrolment target decreased or stayed the same, demonstrating an overall trend of reduced enrolment levels over time (Table 6.3; summarised in Figure 6.1).

Table 6.3 Number of centres meeting enrolment target from baseline to follow up (Trial data used to provide summaries with permission)

Local authority ID	Number of participating centres	Number of centres meeting enrolment target at baseline	Number of centres meeting enrolment target at follow-up	Increase, decrease or stay the same (+/-/±)
Intervention arm				
1	6	5 (83.3%)	1 (16.7%)	-
2	3	2 (66.7%)	0 (0%)	-
4	5	2 (40%)	2 (40%)	±
5	9	5 (55.6%)	3 (33.3)	-
7	1	1 (100%)	0 (0.0%)	-
8	14	10 (71.4%)	7 (50%)	-
10	8	4 (50.0%)	1 (12.5)	-
15	4	1 (25.0%)	1 (25%)	±
17	3	1 (33.3%)	0 (0%)	-
20	8	2 (25.0%)	0 (0%)	-
Control arm				
3	2	0 (0%)	0 (0%)	±
6	5	5 (100%)	3 (60.0%)	-
9	6	2 (33.3%)	2 (33.3)	±
11	2	0 (0%)	0 (0%)	±
12	3	3 (100%)	1 (33.3%)	-
13	4	3 (75.0%)	0 (0%)	-
14	9	4 (44.4%)	0 (0%)	-
16	9	4 (44.4%)	3 (33.3%)	-
18	10	5 (50.0%)	2 (20.0%)	-
19	15	8 (53.3%)	0 (0%)	-

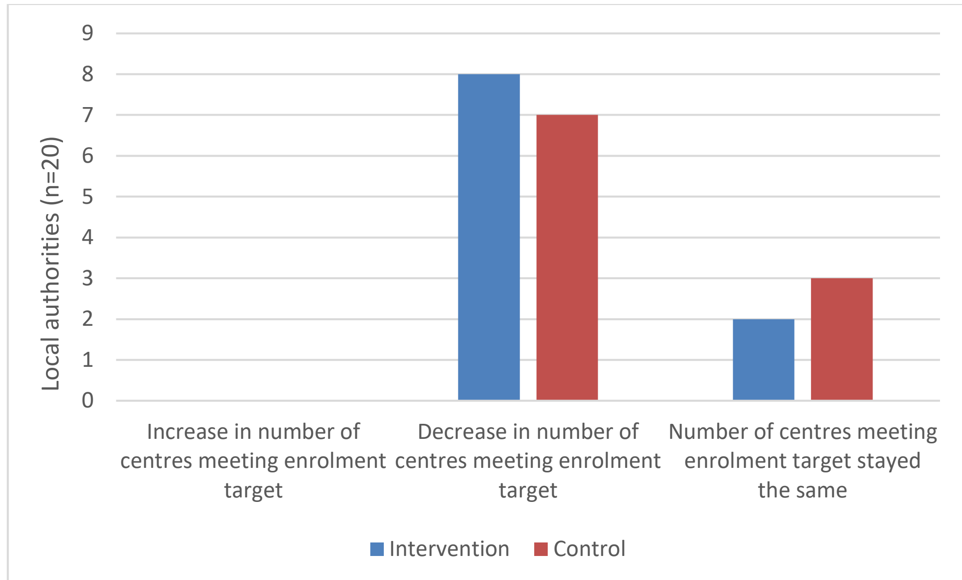


Figure 6.1 Number of local authorities where enrolment levels increased, decreased or stayed the same from baseline to follow up.

6.2.5.2 Attendance

Similar results were observed for attendance levels (Table 6.4: summarised in Figure 6.2). In all local authorities (intervention and control), the number of centres that met the attendance target decreased or stayed the same, highlighting an overall downward trend in attendance levels.

Table 6.4 Number of centres meeting attendance target from baseline to follow up (Trial data used to provide summaries with permission)

Local authority ID	Number of participating centres	Number of centres meeting attendance target at baseline	Number of centres meeting attendance target at follow up	Increase, decrease or stay the same (+/-/±)
Intervention arm				
1	6	2 (33.3%)	1 (16.7%)	-
2	3	1 (33.3%)	1 (33.3%)	±
4	5	2 (40.0%)	1 (20.0%)	-
5	9	6 (66.7%)	3 (33.3%)	-
7	1	1 (100%)	0	-
8	14	3 (21.4%)	3 (21.4%)	±
10	8	3 (37.5%)	1 (12.5%)	-
15	4	3 (75.0%)	0 (0%)	-
17	3	1 (33.3%)	1 (33.3%)	±
20	8	2 (25.0%)	0	-
Control arm				
3	2	0	0	±
6	5	1 (20.0%)	1 (20.0%)	±
9	6	3 (50.0%)	0	-
11	2	2 (100%)	0	-
12	3	2 (66.7%)	2 (66.7%)	±
13	4	2 (50.0%)	1 (25.0%)	-
14	9	4 (44.4%)	1 (11.1%)	-
16	9	4 (44.4%)	0	-
18	10	6 (60.0%)	1 (10.0%)	-
19	15	6 (40.0%)	1 (6.7%)	-

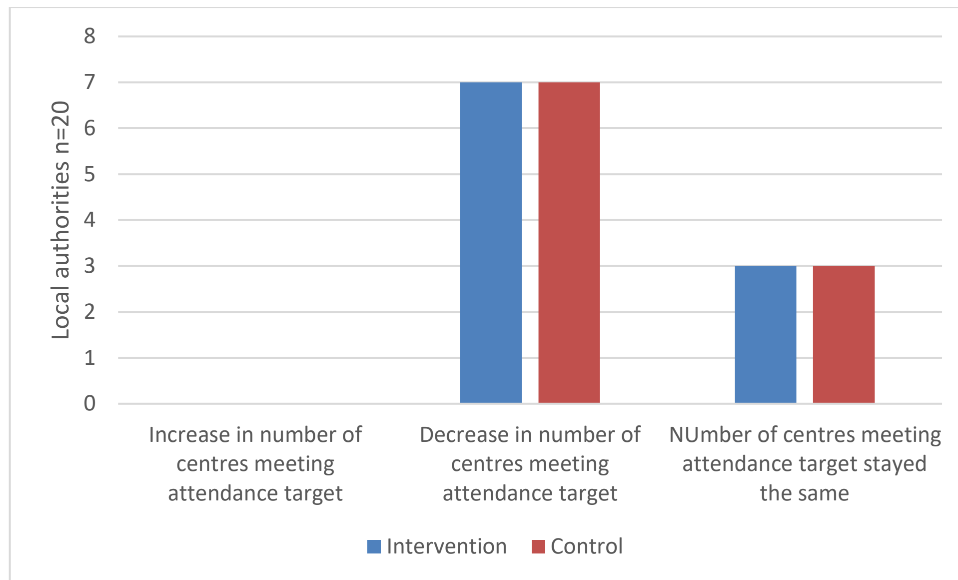


Figure 6.2 Number of local authorities where attendance levels increased, decreased or stayed the same from baseline to follow up.

6.3 Process evaluation of participant engagement intervention: Results

The objectives of the process evaluation were: to assess the extent to which intervention components were implemented (research objective 1), explore whether change mechanisms proposed in the theory of change were enacted (research objective 2), determine whether target behaviors were performed at the commissioner and manager levels of the intervention (research objective 3) and explore contextual factors that may have influenced the theory of change (research objective 4).

6.3.1 Results for research objective 1: implementation of the participant engagement intervention

6.3.1.1 Results: Dose delivered

Dose of the intervention delivered varied between local authorities and was not delivered in full in any of the areas (Table 6.5). The commissioner overview leaflet was delivered to all but one area, but the commissioner outcome report was delivered at the appropriate time points (baseline and after each delivered programme) in just three out of ten areas (30%). Dashboard reports were not delivered to all centres and were not delivered at all in four local authorities. Manager workshops were not delivered in two local authorities (20%) and were adapted in four areas (40%). Facilitator workshops were not delivered in four local authorities (40%) and were adapted in one local authority (10%). Adaptations of manager and facilitator workshops included one-to-one meetings being held instead of the group workshop format, and in one local authority, the manager workshop was delivered to nursery staff rather than children's centre managers (see section 6.3.2). Revised promotional materials were only used in four local authorities (40%). Therefore, the intervention was not fully delivered as planned.

Table 6.5 Delivered intervention components in participating local authorities

Local authority ID	Commissioner overview leaflet delivered	No. of commissioner reports delivered (from a specified 3 time points)	Dashboard report (Number of centres that received at least one dashboard report)	Manager workshop delivered	Facilitator workshop delivered	Re-branded promotional material used
1	Yes	3	1 (16.7%)	Yes	Yes	Yes
2	Yes	3	1 (33.3%)	Yes	Yes	No
4	Yes	1	0	Yes (adapted)	No	No
5	Yes	3	2 (22.2%)	Yes	Yes	No
7	Yes	0	0	Yes (adapted)	Yes (adapted)	No
8	Yes	2	3 (21.4%)	Yes (adapted)	Yes	Yes
10	Yes	2	0	No	No	Yes
15	Yes	2	1 (25.0%)	Yes (adapted)	No	No
17	Yes	2	2 (66.7%)	Yes	Yes	Yes
20	No	0	0	No	No	No

6.3.1.2 Results: fidelity

Incorporation of specified behaviour change techniques in intervention materials

Overall, intervention materials designed by HENRY central office (commissioner overview leaflet, commissioner report, dashboard report, manager and facilitator workshop session plans) incorporated the majority of behaviour change techniques specified during development of the participant engagement intervention. However, manager and facilitator workshop session plans incorporated just 64.2% and 50% of the specified behaviour change techniques respectively (Table 6.6). For example, Manager workshop session plans did include information on the benefits of taster sessions, allowing a mix of referred and self-referred parents to enrol and peer recruitment, but did not include some action planning and goal setting activities. Facilitator workshop session plans did include information on the benefits of performing target behaviours but did not include demonstrations of how to perform them. No content was included on the importance of allowing enough time for group discussion during HENRY sessions.

Table 6.6 Incorporation of the specified behaviour change techniques in intervention materials

BCT code	Detail	Incorporated as specified (1=yes; 0.5=partial; 0=no)
Commissioner overview leaflet *(Behaviour change wheel function = persuade)*		
5.6 Information on social consequences	Written information provided on the consequences of:	
	a. Delivering HENRY programmes i.e. how it meets national public health targets	1
	b. Delivering taster sessions prior to each HENRY programme	0.5
	c. Allowing a mix of referred and self-referred parents on to HENRY programmes and the expected outcomes	1
	d. Delivering HENRY training to more staff	1
	e. Utilising peer to peer recruitment	1
Percent of BCTs delivered		4.5 / 5 (90.0%)
Commissioner report *(Behaviour change wheel function = persuade and enable)*		
5.6 Information on social consequences	Written information provided on how HENRY benefits participants (parent outcome data)	1
12.5 Adding objects to the environment	Provision of reports to aid decision making	1
Percent of BCTs delivered		2 / 2 (100%)
Dashboard report (*Behaviour change wheel function = persuasion*)		
2.7 Feedback on outcome of behaviour	Feedback on enrolment and attendance for last delivered programme	1
5.6 Information on social consequence	Information on how HENRY has benefitted participants from attending (parent outcome data)	1
Percent of BCTs delivered		2/ 2 (100%)
Promotional material (*Behaviour change wheel function = persuade and enable*		
12.5 Adding objects to the environment	Promotional material provided to children's centres to prompt children's centre staff to promote HENRY accurately	1
4.6 Information on social consequences	Written information provided on what HENRY entails and how participants can benefit from attending	1
Percent of BCTs delivered		2 / 2 (100%)
Manager information workshop (*Behaviour change wheel function = persuade and enable*)		

BCT code	Detail	Incorporated as specified (1=yes; 0.5=partial; 0=no)
5.6 Information on social consequences	Information provided on:	
	a. The consequences of delivering taster sessions prior to each HENRY programme	1
	b. Promoting HENRY widely in the centre using a variety of methods	0
	c. Enrolling a mixture of referred and self-referred parents	1
	d. Delivering HENRY programmes regularly and planning programmes far in advance	0.5
	e. Increasing the provision of HENRY core training for staff	1
	f. Adopting a whole centre approach to HENRY	0
	g. Recruiting via peer recruitment	1
1.4 Action planning	Prompt managers to plan how they will:	
	a. Deliver taster sessions prior to each HENRY programme	1
	b. Promote HENRY widely in the centre using a variety of methods	1
	c. Enrol a mixture of referred and self-referred parents to HENRY	1
	d. Deliver HENRY programmes regularly and plan programmes far in advance	0.5
	e. Increase the provision of HENRY core training for staff	1
	f. Adopting a whole centre approach to HENRY	0
	g. Recruit via peer recruitment	0
1.3 Goal setting	Encourage managers to set a goal for:	
	a. How many taster sessions they will deliver during the study	1
	b. How they will promote HENRY during the study	1
	c. Ensuring that a mixture of referred and self-referred parents to HENRY are enrolled onto programmes	1
	d. How many programmes they deliver how far in advance they will plan	0.5
	e. How many staff will receive core training	1
	f. Adopting a whole centre approach to HENRY	0
	g. Recruiting participants to HENRY via peer recruitment	0
Percent of BCTs delivered		13.5 / 21 (64.2%)
Facilitator refresher training workshop (*Behaviour change wheel function = persuade and train*)		
	Information on the consequences of:	

BCT code	Detail	Incorporated as specified (1=yes; 0.5=partial; 0=no)
5.6 Information on social consequences (persuade)	a. Introducing peer recruitment to HENRY parents b. Ensuring parents feel comfortable during group sessions (e.g. tailor content appropriately and allow enough times in session for group discussion) c. Information on the consequences of following up on people that miss a session	1 1 1
4.1 Instruction on how to perform behaviour (train)	Instruct how to: a. Introduce peer recruitment to HENRY parents b. Ensure parents feel comfortable during sessions (e.g. tailor content appropriately and allow enough times in session for group discussion) c. follow up on people that miss a session	 1 0.5 0
6.1 Demonstration of the behaviour (train)	Demonstrate how to: a. Introduce peer recruitment to HENRY parents b. Ensure parents feel comfortable during sessions (e.g. tailor content appropriately and allow enough times in session for group discussion) c. Demonstrate how to follow up on people that miss a session	 0 0 0
Percent of BCTs delivered		4.5 / 9 (50.0%)

Delivery of face to face components (manager and facilitator workshops)

Workshop delivery checklists indicated that the fidelity of delivery in accordance to the session plan was high overall, with the exception of one manager workshop where only 38.9% of behaviour change techniques were delivered (Table 6.7). However, fidelity data were not received from any workshops that were delivered one-to-one instead of group workshop format. Researcher observations (undertaken by PhD candidate) took place in three manager and two facilitator workshops. In these workshops, researcher fidelity data were consistent with self-report data.

Table 6.7 Fidelity of delivery of manager and facilitator workshops (self-report)

	Local Authority ID									
	1	**2**	**4**	**5**	**7**	**8**	**10**	**15**	**17**	**20**
Manager workshop delivery	77.8%		100%*	38.9%*	**	**	DNR	**	100%*	DNR
Facilitator workshop delivery	100%	100%*	DNR	100%*		100%	DNR	DNR		DNR

* Workshop observed by researcher

** Workshop adapted

Blank fields indicate delivery checklist not received

DNR = workshop did not run

6.3.1.3 Results: reach

Attendance data were received from three out of eight manager workshops (37.5%) and four out of six facilitator workshops (66%). Based on these data, a high level of reach was achieved within areas that delivered a programme. Eighteen people attended manager workshops from a possible 23 children's centres (78%). Thirty-five people attended facilitator workshops from a possible 32 children's centres, suggesting that all centres were represented. A high level of reach within the local authorities that delivered workshops indicated that attendees were likely to be representative of managers and facilitators in those areas. However, the level of reach across all areas could not be determined due to the lack of attendance data received.

In summary, the participant engagement intervention was not fully delivered as planned in any of the local authorities, but was delivered to some extent in all but one. The majority of behaviour change techniques specified during the intervention development were incorporated in intervention materials, but manager and facilitator workshops session plans did not include all intended components. Group workshops were mostly delivered in accordance with the session plans, but fidelity data were not received from one-to-one sessions with managers. Where delivered, attendance at group workshops was high.

6.3.2 Results for research objective 2: change mechanisms

Change mechanisms were explored via qualitative interview, manager workshop observations and workshop evaluation forms. Seventeen interviews were undertaken between May and October 2018 (Table 6.8). Six out of 18 (33.3%) invited commissioners and nine out of 49 (18.3%) invited managers agreed to take part. Some interviewees were not in post at the time of the intervention, or could not recall specific elements of the intervention components. Two HENRY facilitators in the control arm were also interviewed where managers were not available. Interviews lasted between 30 and 60 minutes.

Observations took place in three out of eight manager workshops (37.5%) and workshop evaluation forms were received from five out of eight manager workshops (62.5%).

Table 6.8 Interview participant summary

Job role	Intervention	Control	Gender (M/F)
Commissioner	n=3	n=3	Female: n=4
Manager	n=7	n=2	Female: n=8 Male: n=1
HENRY Facilitator (representing centre managers)		n=2	Female: n=2

6.3.2.1 Results: enactment of commissioner level theory of change

As illustrated in the theory of change (Figure 5.4), the commissioner report and overview leaflet were designed to 'persuade' and 'enable' commissioners to support managers in their performance of target behaviours. In order to do this, the report provided information on how the HENRY programme benefitted families that attended, and the overview leaflet described the benefits of promoting parent engagement and performing target behaviours.

In interviews with commissioners, all consistently felt that the provision of a report and overview leaflet was a good strategy for persuading commissioners to support investment in HENRY engagement practices. In particular, highlighting how HENRY benefited the families that attended, was thought to be helpful, to determine how much of their valuable resource should be placed into HENRY engagement efforts:

> *"Staff are pressured aren't they, the resources are pressured, you need to make sure you're doing what ultimately is gonna make a difference for the families, and if HENRY's not working then I'm sure they [children's centres] could be doing other work couldn't they" (Commissioner in the control arm)*

However, in order for these data to be persuasive enough to motivate them to invest extra resources into engagement efforts, commissioners described how data provided in the report would need to be tangible and robust:

> *"I think if it's as detailed as they're eating more apples or something like that then no (it would not be persuasive), but if it's kind of reported on an annual basis, this percentage of people that actually changed their behaviour for the better, you know, something that broad then yeah" (Commissioner in the intervention arm)*

Commissioners stated that recommendations to promote engagement within the overview leaflet could be more persuasive, if they were informed by the experiences of other local authority areas with similar demographics, so that they could be confident that the target behaviours would be likely to work in their target population:

“I like trends and trend data and some comparisons to other areas that are probably, you know, that are equivalent to [name of local authority]. Like what are the statistical neighbours doing? what do [name of local authority] do? I’m not interested in a leafy suburb, what are people like us doing, what are their numbers like, what is their retention like?” (Commissioner in the control arm)

One commissioner felt strongly that the source of the intervention was important for instigating behaviour change. They did not agree with the HENRY approach because they felt it was too middle class for their families, therefore, they said they would be unlikely to change their behaviours, if the recommendations were presented by HENRY:

“I really struggle with HENRY [sigh]. I struggle with it because, it’s kind of ‘oh you’re writing that in a red pen today’ and ‘you’re writing that in a blue pen tomorrow’ type of thing. And I did the course right at the beginning when I just thought it was very, very middle class. Very kind of you know, ‘here’s a portion of quinoa!’ […] Maybe it’s my attitude, but if HENRY sent me a leaflet saying ‘we think you should do that’, I’d think ‘oh really!’” (Commissioner in the control arm)

In interviews with commissioners from the intervention arm that received the report (*n*=2), one explained that at the time of the intervention, their centres were already using some of the target behaviours to engage parents to HENRY, but following receipt of the intervention, they did make some other small changes:

“We kind of changed the leaflet and made it a bit more personalised [shows the leaflet] - you can see on the back it’s got the practitioners photo on it because we wanted to sort of break down barriers. We spent more time getting the children’s centres to do displays and making them more sort of HENRY focused so that HENRY became recognised in the children’s centre and embedded, that was really important”. (Commissioner in the intervention arm)

The second commissioner explained that after receiving the report and leaflet, they did not make any changes to their children's centre practices. This was because they already achieved high enrolment and attendance levels. Instead, the commissioner decided to deliver the workshops that were intended for centre managers to nursery and health visiting staff in order to encourage them to refer more to the programme. Therefore, although their actions were positive towards HENRY engagement, this prevented manager workshops from being delivered to their intended audience:

> "*HENRY's embedded for us and our challenge with HENRY is that I need more staff to deliver more programmes. We usually have about 8, 9 which I think, which we're quite happy with really […] But I wasn't 100% confident that when a child who would come into that [nursery] room was overweight, that they were being signposted and referred into HENRY. So [the workshop] was to make sure that they have it on the forefront of their mind really." (Commissioner in the control arm)*

6.3.2.2 Results: enactment of manager level intervention

At the manager level of the participant engagement intervention, manager workshops and dashboard reports were designed to 'persuade' and 'enable' managers to perform target behaviours.

<u>Dashboard report</u>

None of the centre managers that were interviewed could recall receiving the dashboard report, but they all described that they would have found it useful to be made aware of enrolment and attendance levels in their centre, so that they could address any issues if needed:

> *"We didn't get those reports really [during the intervention] which would have been helpful - I think it would have helped with obviously whether we're doing this right or whether we could change things and stuff" (Manager in the intervention arm)*

This suggested that had they been delivered as planned, the dashboard report had the potential to persuade some managers to perform target behaviours.

Workshops

Workshop evaluation forms

Evaluation forms providing acceptability data were received from five out of eight (62.5%) workshops. High scores were received for the majority of items with a low interquartile range (IQR) (Table 6.9), suggesting that the workshops were acceptable overall. Questions that received a lower response and a higher IQR were Q9: To what extent can you apply the information you received in your centre? (3.8 out of 5; IQR 0.9) and Q10: Overall, what do you think of the parent engagement strategies that were recommended to you? (3.7 out of 5; IQR 1.1) suggesting that acceptability of target behaviours varied by area.

Table 6.9 Acceptability data from manager workshop evaluation forms

Question	Likert scale	**Median** (% of total available score)	Q1	Q3	IQR
1. How would you rate the session overall?	1-4 (poor-excellent)	3.3 (82.5%)	3.2	3.7	0.5
2. To what extent was attending the session worth your time?	1-5 (not at all-extremely)	4 (80.0%)	3.8	4.2	0.4
3. Description of optimisation intervention purpose and aims	1-5 (very poor-very good)	4.3 (86.0%)	4.0	4.5	0.5
4. Session content	1-5 (very poor-very good)	4.3 (86.0%)	4.0	4.3	0.3
5. Quality of materials and delivery	1-5 (very poor-very good)	4.3 (86.0%)	3.9	4.3	0.4
6. Level of participant involvement	1-5 (very poor-very good)	4.3 (86.0%)	4.2	4.5	0.3
7. Organisation of session	1-5 (very poor-very good)	4.5 (90%)	4.1	4.5	0.4
8. How useful was attending this sessions for you taking back to your work environment	1-5 (not at all-extremely)	4.1 (82.0%)	3.9	4.2	0.3
9. To what extent can you apply the information you received in your centre?	1-5 (not at all-extremely)	3.8 (76.0%)	3.6	4.5	0.9
10. Overall, what do you think of the parent engagement strategies that were recommended to you?	1-5 (very poor-excellent)	3.7 (74.0%)	2.9	4	1.1

Workshop observations

Observations took place in three out of eight manager workshops (37.5%). During the workshops, all attendees appeared to engage with group activities by being actively involved in group discussions and activities. In two of the workshops, attendees explained that they had limited knowledge of HENRY and welcomed the opportunity to learn more. In one workshop, managers were particularly happy about meeting other managers in their area, as they had previously never engaged with each other. During all workshops, discussions around the target behaviours focused on some more than others. For example, in all workshops, peer recruitment was viewed positively, with some managers describing how they planned to implement this during the trial. Providing additional HENRY training for staff and delivering taster sessions were also consistently well received. However, in two of the workshops, managers described that a general barrier to promoting engagement with HENRY was a limited number of crèche places available to support parents.

Manager interviews

In interviews with managers in the intervention arm (n=7), two were not in post at the time of the study, and two could not remember if they attended a workshop or not. Therefore, they were unable to describe their responses to the intervention. None of the managers that remembered attending the workshop (n=3) changed their behaviour:

> *"Well, if I'm perfectly honest and I was thinking about this the other day […]. when we went there (to the workshop) it was just the one workshop that we went to, we were in the middle of our other consultation at that point and like I say, we were so busy trying to get the clusters together that everything just went by the by really" (Manager in the intervention arm).*

In interviews with managers that had not attended a workshop (n=4 intervention; n=2 control), their perceptions of how acceptable they would have found it were mixed. Three managers described how they go to a lot of meetings around HENRY where promotion is discussed, and therefore, they would not have found it useful. But, in contrast, two managers said that being given a refresher on HENRY and knowledge sharing with other managers would have been useful:

> *"We just need a huge refresher because you can say to me what HENRY is, I can say to you what HENRY is, but do I really know what the programme entails? what we can do to promote it? and you just think it's just another programme that you think 'oh parents are not gonna come', it's just gonna probably die a death, but unless you really know about it and what you can do to make sure that it doesn't do that, I think a little bit more awareness is needed." (*Manager in the intervention arm)

Therefore, although commissioner and manager levels of the intervention appeared to be acceptable and had the potential to change behaviours, interviews suggested that the intervention did not trigger behaviour change as proposed in these areas.

6.3.3 Results for research objective 3: behaviour change

As described in Chapter Five (methods), target behaviours 1-4[i] were measured via routine process data provided by central HENRY office, and target behaviours 4[ii]-7 were assessed via pre- and post-intervention questionnaires. The response rate for the pre- and post-intervention questionnaires was low; with just 6 out of 65 centres (9%) in the control arm and no centres in the intervention arm returning the questionnaire at both baseline and follow up. Therefore, performance of target behaviours 4[ii]-7 could not be assessed.

6.3.3.1 Results: comparison of behaviour change between trial arms (target behaviours 1-4[i])

Fourteen centres in the intervention arm (52.8%) delivered a taster session prior to a HENRY programme compared to just five in the control arm (19%). The number of centres that enrolled parents via self-referral and recruited via peer recruitment was similar between arms (Table 6.10; summarised in Figure 6.3). The number of centres that increased the number of HENRY

programmes delivered during the trial did not differ between arms (Table 6.11; summarised in Figure 6.4). As the data were descriptive with small numbers in each group, significance of the difference between groups for the delivery of taster sessions was not tested, data were also not adjusted to reflect local authority clustering. The similarities between arms (with the exception of taster sessions) were consistent with trial outcomes and highlighted that centres in both trial arms (intervention and control) performed some of the target behaviours during follow up.

Table 6.10 Number and percentage of centres that performed target behaviours 1-3 during follow up (data summary provided by trial statistician and used with permission)

	Intervention (n=26 centres that delivered a programme)	**Control** (n=26 centres that delivered a programme)	**Total** (n=52 centres that delivered a programme)
Taster sessions delivered at the centre			
Yes	14 (52.8%)	5 (19%)	19 (36.5%)
No	9 (34.6%)	20 (76.9%)	29 (55.8%)
Missing	3 (11.5%)	1 (3.8%)	4 (7.7%)
Total	26 (100%)	26 (100%)	52 (100%)
Parents enrolled via self-referral			
Yes	8 (30.8%)	9 (34.6%)	17 (32.7%)
No	8 (30.8%)	8 (30.8%)	16 (30.8%)
Missing	10 (38.5%)	9 (34.6%)	19 (36.5%)
Total	26 (100%)	26 (100%)	52 (100%)
Parents enrolled via peer recruitment			
Yes	5 (19.2%)	4 (15.4%)	17 (32.7%)
No	16 (61.5%)	21 (80.8%)	16 (30.8%)
Missing	5 (19.2%)	1 (3.8%)	19 (36.5%)
Total	26 (100%)	26 (100%)	52 (100%)

Table 6.11 Number and percentage of centres that increased the number of programmes delivered during follow up (target behaviour 4[i])

	Intervention (n=26 centres that delivered a programme)	**Control** (n=26 centres that delivered a programme)	**Total** (n=52 centres that delivered a programme)
Increased number of HENRY programmes delivered			
Yes	7 (26.9%)	7 (26.9%)	14 (26.9%)
No	19 (73.1%)	19 (73.1%)	38 (73.1%)
Total	26 (100)	26 (100)	52 (100%)

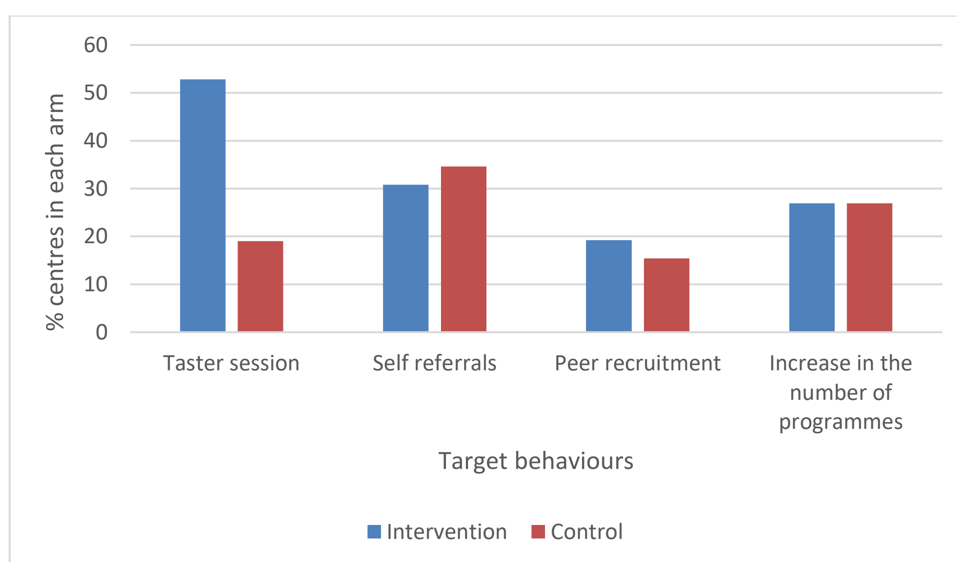


Figure 6.3 Percent of centres performing target behaviours in each arm from those that delivered a programme (n=52)

6.3.3.2 Results: performance of target behaviours in local authorities that received the intervention

In the intervention arm, performance of target behaviours varied between areas (Table 6.12; summarised in Figure 6.4). For example, three local authorities did not perform any of the target behaviours, but two local authorities performed all four target behaviours in at least one centre.

Table 6.12 Number and percent of centres that performed target behaviours in local authorities in the intervention arm

Local authority ID	**Number of centres**	**Number of centres that delivered taster session** (% centres in LA)	**Number of centres that recruited mix of referred and self-refer** (% centres in LA)	**Number of centres that recruited via peer recruitment** (% centres in LA)	**Number of centres that increased the number of programmes** (% centres in LA)
1	6	2 (33.3%)	2 (33.3%)	1 (16.7%)	0
2	3	0	0	0	0
4	5	1 (20.0%)	0	0	0
5	9	5 (55.6%)	2 (22.2%)	2 (22.2%)	5 (55.6%)
7	1	0	0	0	0
8	14	4 (28.6%)	2 (14.3%)	1 (7.1%)	1 (7.1%)
10	8	0	1 (12.5%)	0	0
15	4	0	1 (25.0%)	1 (6.7)	0
17	3	2 (66.7%)	0	0	2 (66.7%)
20	8	0	0	0	0

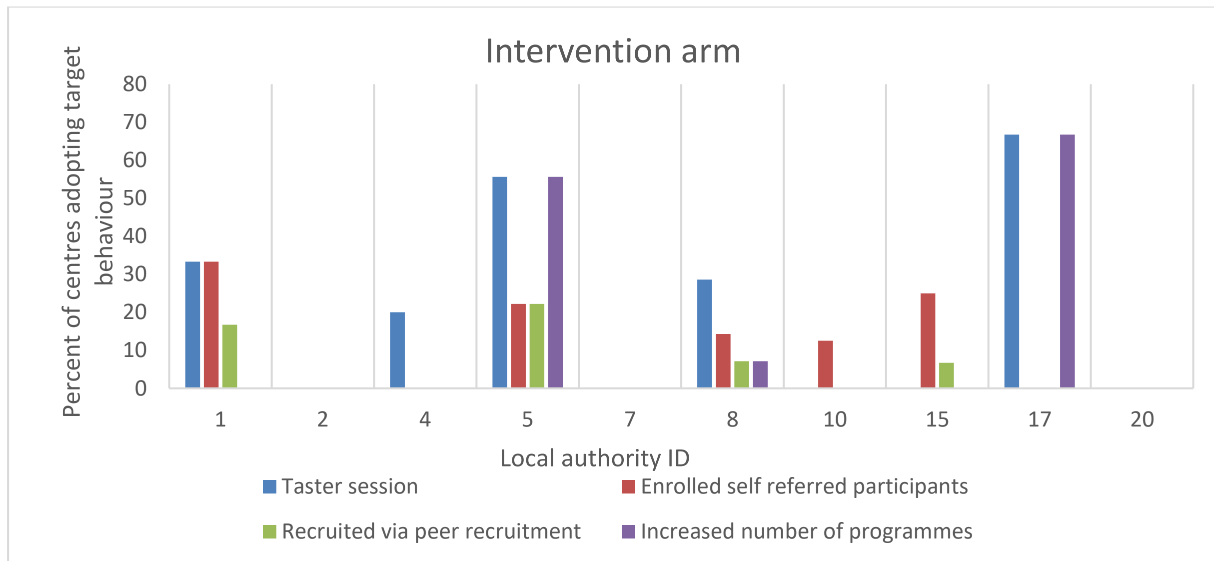


Figure 6.4 Percent of centres performing target behaviours in local authorities in the intervention arm

6.3.3.3 Results: delivery of intervention and target behaviours

There were no clear links between delivery of the intervention components, and performance of target behaviours (Table 6.13). In Local Authority 5, commissioner overview leaflets were delivered at three out of three time points, an un-adapted manager workshop was delivered, and at least one centre received a manager dashboard report. In this area, all four target behaviours were adopted in at least two (22.2%) of centres. In contrast, in Local Authority 2 the intervention was delivered to a similar extent, yet none of the target behaviours were performed in any of the centres, confirming that performance of target behaviours was independent of the intervention.

6.3.3.4 Results: performance of target behaviours and enrolment and completion outcomes.

A potential relationship between performance of target behaviours and trial outcomes (enrolment and attendance levels) was also explored (Table 6.13). However, as enrolment and completion levels stayed the same or decreased in all local authorities, irrespective of whether target behaviours were performed, there was no indication of a link.

Table 6.13 Dose of intervention delivered, performance of target behaviours and trial outcomes

Local authority ID	**Dose of participant engagement intervention delivered**				**Target behaviours**				**Trial primary outcome (enrolment and attendance)**	
	Commissioner overview leaflet delivered	No. of commissioner reports delivered (from a potential 3 time points)	Manager workshop delivered	Dashboard report (% of centres delivered to within LA)	Number of centres that delivered taster session (% centres in LA)	Number of centres that recruited mix of referred and self-refer (% centres in LA)	Number of centres that recruited via peer recruitment (% centres in LA)	Number of centres that increased the number of programmes delivered (% centres in LA)	Number of centres meeting enrolment target increase, decreased or stayed the same (+/-/±)	Number of centres meeting attendance target increase, decreased or stayed the same (+/-/±)
1	Yes	3	Yes	1 (16.7%)	2 (33.3%)	2 (33.3%)	1 (16.7%)	0	-	-
2	Yes	3	Yes	1 (33.3%)	0	0	0	0	-	±
4	Yes	1	Yes (adapted)	0	1 (20.0%)	0	0	0	±	-
5	Yes	3	Yes	2 (22.2%)	5 (55.6%)	2 (22.2%)	2 (22.2%)	5 (55.6%)	-	-
7	Yes	0	Yes (adapted)	0	0	0	0	0	-	-
8	Yes	2	Yes (adapted)	3 (21.4%)	4 (28.6%)	2 (14.3%)	1 (7.1%)	1 (7.1%)	-	±
10	Yes	2	No	0	0	1 (12.5%)	0	0	-	-
15	Yes	2	Yes (adapted)	1 (25.0%)	0	1 (25.0%)	1 (6.7)	0	±	-
17	Yes	2	Yes	2 (66.7%)	2 (66.7%)	0	0	2 (66.7%)	-	±
20	No	0	No	0	0	0	0	0	-	-

6.3.4 Research objective 4: context

6.3.4.1 Results: children's centre characteristics

Responses for the children's centre characteristics questionnaires was received from just 26 out of 126 centres (20.6%) (n=13 intervention; n=13 control). Responses that were received revealed differences in: the number of staff working in the centres, funding restrictions that limited HENRY delivery, the number of commissioned programmes offered by the centre, and the HENRY delivery model (Table 6.14). All of these had the potential to influence performance of target behaviours. For example, smaller staff teams could have reduced a centre's capacity to perform the target behaviours and funding restrictions limiting HENRY delivery could have influenced the number of crèche places available for parents, potentially limiting the number of places available.

Table 6.14 Characteristics of participating centres provided by centre managers

Question	Response	Intervention (n=13)	Control (n=13)
Number of staff working in centres	1-5 6-10 11-20 20+	2 2 2 7	2 4 4 3
Organisation children's centre resourced by	Local authority Local authority/private provider Local authority/charity Local authority/NHS Private provider	9 1 2 0 1	10 1 1 1 0
Experienced funding restrictions that have limited HENRY delivery	Yes No	8 5	3 10
Number of commissioned programmes delivered in centre	0-3 4-6 7-10 10+	5 7 0 1	8 4 1 0
HENRY delivered internally or externally	Internally Externally Both	7 4 3	9 0 4

6.3.4.2 Results: key contextual themes derived from inductive qualitative analysis

As described in section 6.3.2, interviews were undertaken with six commissioners, nine managers, and two facilitators representing centre managers. Workshops were observed in three out of eight manager workshops and two out of four facilitator workshops. Inductive qualitative analysis exploring contextual factors surrounding the theory of change highlighted four key themes that provided insight into why the intervention was not found to be effective: organisational change and reduced funding, variance between the settings, parent engagement efforts outside of the study and centre level engagement with HENRY.

Organisational change and reduced funding

The local authority budget cuts brought on by National Government austerity measures between 2010 and 2019 led to many local authorities in England to scale back children's centre services, resulting in reduced budgets, the clustering of centres and job losses. Many participating managers described going through a 'consultation' or 'restructuring' at the time of the study, where the future of their centre was under review along with the types of services that would be offered moving forward. Some managers described how this overshadowed engagement with the study, and given the turbulent context, it was unlikely that managers were suitably persuaded to invest additional time and resources into HENRY engagement efforts.

> *"Looking at what was going on in the local authority at the time, it probably wasn't the best time for us to be part of that study. Cos I know through kind of the end of 2015-2016 they were just starting to get rid of managers left, right and centre so unfortunately I don't think HENRY was probably top of their radar if I'm completely honest." (Manager in the intervention arm)*

Reduced staff capacity and funding restrictions were reported by some managers as presenting practical barriers to performing target behaviours; for example, delivering taster session prior to each programme. As described above, centre data suggested that some centres had fewer than five staff, which could have made it difficult for managers to free staff from other duties (Table 6.15):

> *"Yes taster sessions was something that we did talk about, but we just didn't have capacity to do them really. People just think "oh well it's a taster session" but actually it's getting ready for that session, doing the session, and looking at it afterwards and a lot of planning and preparation you know has to go into it"* (Manager in the intervention arm)

Despite the aim of the intervention being to increase enrolment and attendance to HENRY, some centres were not in a position to increase their course capacity due to financial constraints on the number of crèche places available to support parents attending HENRY. This is consistent with the findings of the ethnography study where managers described how they needed to prioritise parents to attend HENRY as they only had a small number of places available (Chapter Three). But, as the aim of the intervention was to promote HENRY enrolment and attendance levels, increasing crèche capacity was fundamental for the intervention to work. Hence, gaining the support of commissioners was important to support additional resource:

> *"If you want more people in then you have to provide the crèche staff […] that's always been probably the most challenging aspect"* (Manger in the intervention arm)

Crèche limitations were also a prominent theme that was discussed in two of the manager workshops as soon as the intervention was introduced:

> *"At the start of the session, the purpose of the project is described well by the session deliverer in terms of highlighting that HENRY is more economically viable if more parents attend. The managers respond to this straight away by saying they could fill HENRY twice over if they had enough crèche places. They go on to explain that as they only have funding for 3 crèche staff, they are only able to have approx. 6 parents if they bring along babies. Further, they also say that they would unable to justify giving crèche places to non-target families"* (observation notes from manager workshop*)*

Therefore, even if the intervention did succeed in persuading and enabling managers to perform target behaviours, practical barriers such as these could have stood in their way, which provides some explanation of the lack of intervention effect.

Variance between the settings

As previously described, questionnaire data (Table 6.14) highlighted differences between children's centres that offered explanation of why there was variability in local authority performance of target behaviours. Qualitative data supported this, whereby managers and commissioners described differing management structures and HENRY delivery models that were used in their areas. As a result, managers and staff members from some of the children's centres had little or no involvement with implementing and promoting the programme and were really only used as a physical venue, within which HENRY was delivered:

> *"The HENRY facilitators in attendance are all nutritionists who work across two local authorities. They all work for an independent organisation delivering commissioned health and well-being programmes. They are responsible for recruiting to the HENRY programme and the children's centre only provide the venue"* (Observation notes from facilitator workshop)

In addition, the variability in centre structures resulted in some areas finding it easier than others to perform target behaviours according to what resources were available to them. For example, in some areas HENRY training was delivered free of charge, as HENRY facilitators were also certified HENRY delivery trainers. Therefore, barriers associated with cost which may have hindered some centres, did not present an issue in others:

> *"In this local authority, core training is provided free of charge as the HENRY facilitators are also certified HENRY core trainers."* (Observation notes from manager workshop)

Parent engagement efforts outside of the study

Despite taking part in a research study, children's centres still sought to promote engagement with HENRY using strategies outside of target behaviours, which may have confounded the effect of the participant engagement intervention. This was a consequence of undertaking research under 'real-world' conditions, where centres continued to engage as many parents as possible to the programme to avoid wasting resources. As such, some interviewees described using pre-programme home visits to reduce the number of people dropping out before the programme starts:

> *"it is best to be able to go out and do a home visit prior to the course so you can see them in their own environment, and then other times we've tried doing like a coffee morning but we've found the home visits more successful."* (Commissioner in the control arm)

As described in section 6.3.3 (behaviour change), many centres in the *control* arm performed target behaviours that were recommended as part of the participant engagement intervention (e.g., taster sessions). One commissioner in the control arm described how this had been informed by learning what worked for similar programmes:

> *"We do the taster session. That was from the children's centres saying it had worked with other parenting courses. It's like holding a pre-session to de-mystify it so the parents weren't scared." (Commissioner in the control arm)*

Some of the target behaviours had become standard practice over the years (in both trial arms) to promote engagement with HENRY. Therefore, some centres were already performing the behaviours at baseline, reducing any potential impact of the participant engagement intervention:

> *"Everything you've said to me (description of target behaviours recommended during the intervention) has rung bells. I think it was recommended and then we've just implemented it and it's actually become not a recommendation, it's just become implemented within our guidelines, how to recruit for HENRY and how to facilitate HENRY." (Manager in the intervention arm)*

This highlights the difficulty of testing an intervention where some of the target behaviours were informed by observations of 'positive deviant' behaviour during the ethnography study (Chapter Three) and therefore already being implemented in some centres. Consequently, it was unavoidable that some of the centres participating in the trial would have already been performing them.

Engagement with HENRY and the intervention

Although the aim of the intervention was to promote HENRY enrolment and attendance levels, the priority the local authorities placed on HENRY itself was mixed, which may have influenced the priority placed on promoting engagement with the programme, despite taking part in the trial. For example, one manager questioned whether HENRY was the right fit for parents in their area:

> *"It has a very WI (Women's Institute) feel about it. I think it needs modernising a little bit, but in a way that's very accessible to those people that don't live what people call 'normal lifestyles'. I'm not sure it really fits in with a lot of the families that we're trying to engage and keep engaged on the course"* (Manager in the control arm)

In addition, at the time of interviews, some participating centres and local authorities were no longer delivering HENRY programmes at all, either due to the programme being de-commissioned, other programmes being focused on (e.g., parenting programmes or mental health initiatives), or HENRY scheduling being dispersed around the cluster, explaining why many centres did not deliver programmes during the trial:

> *"We work as part of a cluster, we do one big cluster timetable […] and we alternate between a nurturing programme and HENRY, each site will do HENRY one term and then they'll do a nurturing the next time"* (Manager in the intervention arm)

Many managers also described HENRY as being resource heavy in terms of planning and delivery, and were therefore put off from delivering it too often, given their limited staffing:

> *"Because of the nature of HENRY and the amount of planning and setting up, and reading, and the length of it, it does impact on us as staffing because in children's centres, as you may well know, we have very limited staffing at any of our centres. HENRY is a very small part of a huge range of things that we offer." (Manager in the control arm)*

6.3.5 Summary of findings

In summary, the participant engagement intervention theory of change broke down in multiple places, providing explanation of why the participant engagement intervention was not found to be effective. Key findings of the process evaluation are summarised in Figure 6.5.

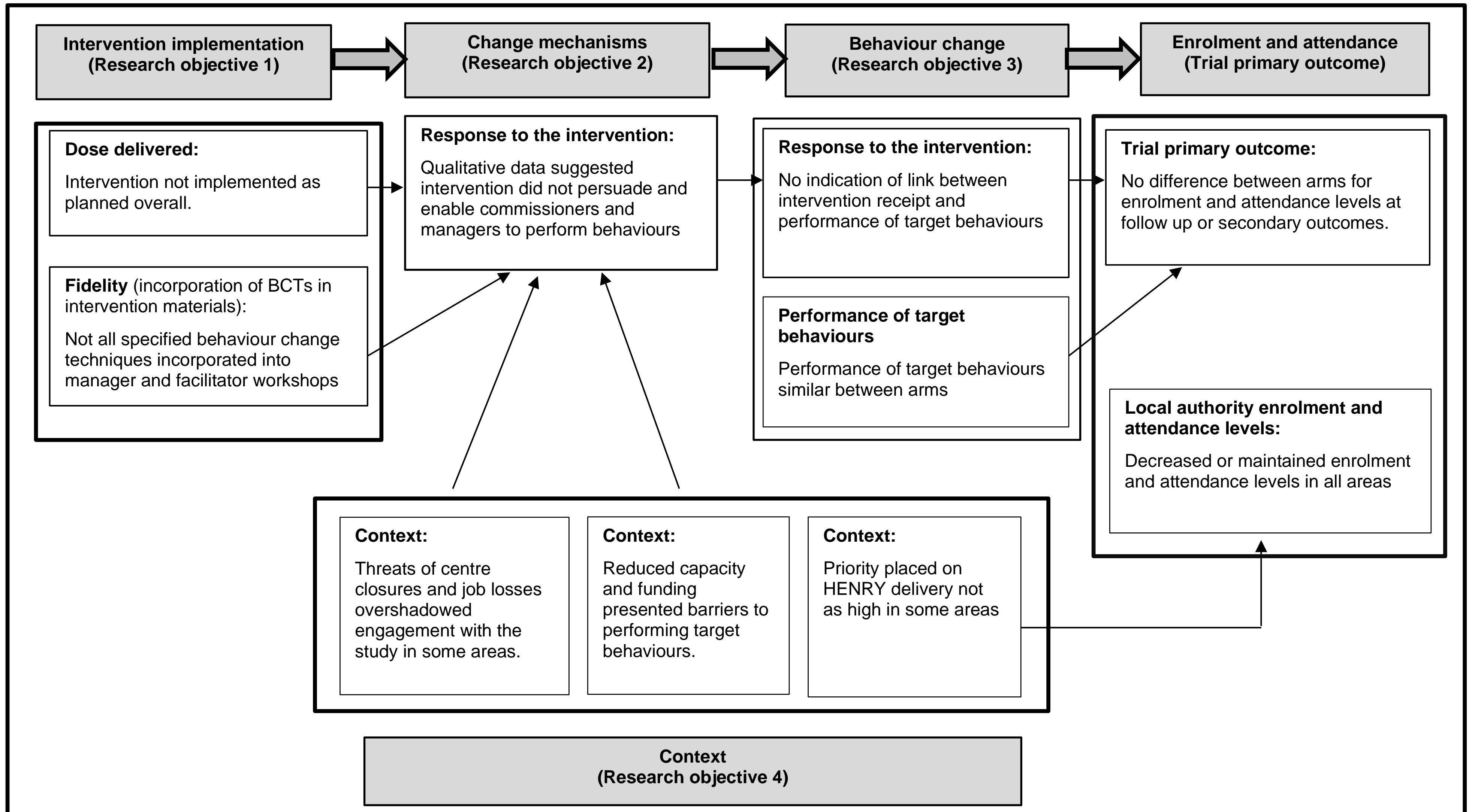


Figure 6.5 Key findings of participant engagement intervention process evaluation

6.3 Discussion

The participant engagement intervention was a multi-component intervention aimed at changing behaviours across multiple levels of the children's centre context to promote HENRY enrolment and attendance levels. A pragmatic approach was taken, whereby the intervention was delivered by local teams as opposed to being research led. This enabled the intervention to be tested in a real-world setting, and enhanced the ability of the intervention to be sustainable beyond the trial period. The national cluster randomised controlled trial found that the participant engagement intervention was not considered to be effective at promoting enrolment and attendance to HENRY. In addition, local authority level data indicated that enrolment and attendance levels had decreased at follow up in the majority of areas. The process evaluation revealed that the likely reason for this lack of effect was that the intervention was not delivered as planned, and proposed change mechanisms may not have persuaded and enabled managers and commissioners to perform target behaviours. Behaviour change outcomes showed that performance of target behaviours varied by area but were similar between trial arms, confirming that performance of the behaviours was independent of the intervention. A key finding of the process evaluation however, was the influence of the local authority and children's centre context, which underpinned all of the findings.

The chaotic climate for children's centres and local authorities at the time of the trial overshadowed engagement with the study. As such, local authority coordinators responsible for delivering parts of the intervention also faced job losses and organisational restructuring that likely limited their commitment to deliver the intervention. Reduced capacity and funding experienced by some centres presented barriers to performing target behaviours, and varying levels of engagement with the HENRY programme appears to have reduced the priority placed on promoting enrolment and attendance. In addition, restricted crèche capacity seems to have limited the number of places available on the HENRY programmes in some areas, preventing enrolment levels from being increased. More broadly, the context itself presented challenging conditions in which to undertake the research. Target behaviours were performed in control and intervention areas and many centres adopted behaviours for promoting engagement outside of those recommended as part of the intervention, which could have confounded any potential effect. Further, many centres may have been performing target behaviours at baseline, making it difficult to

disentangle any potential effect of the intervention in instigating behaviour change. Finally, many centres did not deliver programmes at all.

Contextual factors have previously been found to hinder interventions from being delivered and received as planned. Harvey et al. (2018) reported poor delivery of an intervention to promote uptake of clinical guidelines in nursing homes as the staff allocated to deliver the intervention lacked the confidence and interpersonal skills to deliver the intervention effectively. Contextual factors, such as logistical challenges and poor organisational support, also limited changes in behaviour. This study, along with the findings of the HENRY participant engagement intervention process evaluation, support the argument for fluid and dynamic interventions that can respond to complex settings. Such interventions are increasingly being advocated by researchers who suggest moving away from standardised intervention delivery to a more responsive approach, whereby intervention components are adapted to fit within a specific context, whilst maintaining underpinning principles and functions (Hawe et al., 2004, Bopp et al., 2013, Pérez et al., 2016). For instance, instead of using manualised workshops to deliver key messages, the same key messages could be delivered in a manner appropriate to the context, but objectives and underlying mechanisms remain the same, allowing the intervention to be evaluated in a randomised controlled trial (Hawe et al., 2004). In the current intervention, workshops were delivered one to one instead of the specified group workshop in some areas. But as this was not planned for in the development phase, key messages were not agreed beforehand. Due to a lack of attendance and fidelity data received from these sessions, it is not clear who attended the one to one sessions and the content participants received. Therefore, if a responsive approach to delivery and evaluation was used, communication between intervention sites and the evaluation team would need to be clear in order to understand how the intervention was adapted and to whom. Crucially however, the influence of some contextual factors on intervention outcomes might have been mitigated if the context itself was considered in more detail during the intervention development phase. As described in Chapter Four (intervention development), a limitation of the BCW approach is the narrow focus on individual behaviours without consideration of the wider context. Therefore, if implementation theory had been drawn upon, consideration might have been given to the children's centres' capacity and willingness to change (Weiner, 2009). Consulting more closely with end-users during the intervention development could have also highlighted issues in advance and revealed ways to alleviate some of those.

The current process evaluation established that the participant engagement intervention was not implemented as planned. As such, behaviour change techniques that were proposed to trigger mechanisms of change were not delivered in some areas. This included some intervention components not being delivered at all in some centres (e.g. dashboard reports), or some specified behaviour change techniques not being incorporated in intervention materials. A study undertaken by Bryant et al. (2019) consulted with stakeholders to determine performance indicators for the delivery of community interventions. There was agreement that fidelity levels of at least 80% were required to be categorised as meeting implementation targets. This was consistent with National Institute of Health Behavioural Change Consortium's fidelity framework (Borrelli et al., 2005). Although this work pertained to parent level participants as opposed to professionals implementing the interventions, the same principles apply. Therefore, as the level to which behaviour change techniques were incorporated in the current intervention's workshops was below 80%, this could have made positive outcomes less likely (Borrelli et al., 2005, Durlak and DuPre, 2008). Almost half of all manager workshops were adapted from group workshops to one to one sessions. Delivery of workshops one to one instead of group workshops is not in itself problematic. However, group interventions are known to have benefits for behaviour change interventions, such as providing opportunities for social support, knowledge sharing and addressing perceived barriers to change (Borek et al., 2019). Bringing people together to relay key messages can result in participants responding more positively, as group members strive for unanimity rather than realistically assessing their own motivations to perform a course of action (Hart, 1991, Ahlfinger and Esser, 2001). This could explain why managers that attended participant engagement intervention workshops responded positively to key messages at the time (as indicated in observations and session evaluation forms), but once back within their settings and away from other managers, they did not act on these positive views, and other priorities took over.

The development of the participant engagement intervention was guided by the literature, expertise of the intervention development team and the findings of the ethnography study. Hence, theoretically, the intervention had a good chance of succeeding in persuading and enabling commissioners and managers to perform target behaviours. Yet, qualitative data suggested, those who did receive the intervention did not change their behaviour. Although, it must be noted, the number of participants interviewed who remembered receiving the intervention was low and not representative of the sample, there was no indication of a link between areas that received a greater dose of the intervention and areas where target behaviours were

performed in more centres. This might indicate that the timing and manner in which the behaviour change techniques were applied (i.e. content and mode of delivery) may not have been persuasive enough to instigate change (Walshe, 2007, Hagger and Weed, 2019) and was likely overshadowed by contextual factors. Some commissioners were of the opinion that they would have been more likely to change their behaviour if information provided in the overview leaflet included case study examples, where engagement levels had increased in areas with similar demographics, which was lacking in the HENRY participant engagement intervention materials. One commissioner also remarked that the source of information was important, and that they would not have taken advice from HENRY on how to promote engagement because they did not feel the HENRY approach was appropriate for their target audience. This is consistent with Social Judgement Theory (Sherif and Hovland, 1961), whereby participants are more accepting of messages if they have a more favourable view of the person or organisation giving the message. For example, in workplace settings, the perceived integrity of a manager influences whether employees decide to engage in a given task (Jena and Pradhan, 2018). As described in Chapter Four (intervention development), piloting of intervention components prior to intervention delivery was not undertaken due to limited time constraints. This would have allowed some of the intervention components to be tested and modified prior to their roll-out to enable a greater impact. However, given the challenging context, it was unlikely that any intervention would have succeeded in persuading commissioners and managers to invest additional time and resources into performing target behaviours without making changes to the physical environment (e.g., offering financial or infrastructural support). This was beyond the scope of the intervention and inconsistent with the pragmatic and sustainable approach adopted.

6.4.1 Strengths and limitations

This process evaluation provides a detailed understanding of why the participant engagement intervention was not found to be effective. Consideration of implementation, proposed change mechanisms, behaviour change and context highlighted factors influencing the theory of change as complex and interactive. The evaluation also highlighted complexities within the research setting that may have otherwise been unidentified. For example, contextual factors hindering local authority and children’s centre engagement with the study and target behaviours being performed in both arms of the trial.

As the potential scale of the process evaluation was large, the focus of enquiry was narrowed to just the commissioner and manager levels. As a result, change mechanisms and behaviour change outcomes at facilitator, staff and HENRY parent

levels were not explored. However, as previously described, commissioner and managers levels of the interventions were proposed to achieve the greatest impact by achieving a spill-over effect and were therefore the most important aspects of the intervention to study in detail.

A wide range of data sources were used in the study which allowed findings to be triangulated (O'Cathain et al., 2010). However, the quantity of the data gathered for the process evaluation was lower than expected. There was poor uptake of interviews from managers and commissioners that had been directly involved in the intervention and there was a low return of questionnaires, limiting assessment of whether all target behaviours were performed; both of which were likely to have been a further consequence of the chaotic setting. The absence of these data prevented change mechanisms and behaviour change outcomes being fully understood. However, data that were gathered provided a comprehensive picture of where the theory of change broke down, leading to a lack of significant effect.

6.4.2 Implications for future research and practice

The participant engagement intervention was delivered during a time of great change within local authority and children's centre services. Ultimately, this unstable context was the main driver preventing the theory of change from being enacted as proposed. A formative rather than summative approach to process evaluation could have highlighted breakdowns in the theory of change at an earlier timepoint, allowing the research team to intervene (Wilson et al., 2009). However, this approach would have contrasted with the pragmatic approach taken which was aimed at embedding system level changes that were sustainable over time, as opposed to being researcher led. Nevertheless, ensuring that more participants were exposed to behaviour change techniques that were proposed to instigate change would have enabled a more rigorous evaluation. In future studies, intervention developers could consider how to ensure that interventions are resilient to organisational shift. For example, participant engagement intervention activities could be repeated over time to maintain engagement and consider contextual factors as they emerge (Koh and Askell-Williams, 2021). Promoting manager led improvement strategies, rather than a standard set of target behaviours, might also be more effective, using a quality improvement method such as the plan-do-study-act (PDSA) cycle, which is a method often used in healthcare settings to overcome context specific barriers to organisational change. This method involves small changes being made in the first instance, followed by evaluation of those changes, prior to wide scale roll out if appropriate (Langley et al., 2009). This approach, or similar would allow commissioners and managers to feel more confident about investing extra resources

into engagement activities. Involving commissioners, managers and staff in the design and implementation of the current intervention could have also promoted local buy-in. Similar interventions could be developed using a co-production approach, whereby end-users are actively involved in developing and implementing the intervention, enabling it to be customised to the setting, thus promoting acceptability and sustainability (Voorberg et al., 2015, Bessant and Maher, 2009).

Due to the lack of data obtained in the study to support or refute proposed change mechanisms and performance of target behaviours, consideration should be given as to how to maximise exploration of these. Assessing the best time to undertake interviews so that intervention recipients are still in post, participants would remember what the intervention entailed, whilst also having time to reflect on how they responded. However, researchers need to be mindful of interviews being viewed as an extra 'intervention' in itself, as contact with the researcher could prompt or promote motivation to change (McCambridge et al., 2014). Quantitative measures could also be greater utilised to measure enactment of change mechanisms. Keyworth et al. (2020) recently developed a questionnaire to test the predictive validity of the COM-B model which has demonstrated acceptability, reliability and validity. Use of a questionnaire such as this might have objectively tested assumptions underpinning the intervention. However, the utility of questionnaire relies on a good response rate for unbiased and statistically powered results (Baruch and Holtom, 2008). As demonstrated here, response rates were low, which was likely due to the same reasons implementation was poor. Therefore, strategies to promote the return of data that are sensitive to context, could enable richer data to be gathered. For example, engaging with specific personnel within the setting to collect and return data.

6.5 Conclusion

The process evaluation of the participant engagement intervention identified possible explanations as to why the participant engagement intervention was not found to be effective. Adopting a theory-based evaluation approach allowed implementation, change mechanisms, behaviour change and context to be explored, which highlighted key factors that influenced the theory of change. The turbulent context surrounding children's centre services diminished engagement with the study and presented barriers to performing target behaviours, as well as presenting challenges to undertaking the research. In order to promote impact of similar participant engagement interventions, an adaptive and responsive approach to intervention delivery could enhance participant exposure to the intervention. Involving end-users in the design of the intervention and consideration of the context during intervention development could promote organisational support and investment in the research.

Exploration of the theory of change would be strengthened by maximising the measurement of process outcomes, enabling underpinning theory to be refined.

Chapter Seven: Overall discussion and implications

7.1 Overview of chapter

This chapter reflects on the contribution of the thesis to the wider literature, and describes the main strengths and weaknesses of the research. The key implications of the thesis and recommendations for future research and practice are then outlined before a brief, overall conclusion.

7.2 Summary of thesis

The aim of this thesis was to develop and evaluate a participant engagement intervention aimed at promoting parent engagement with the HENRY programme. In Chapter One, the thesis outlined the need to develop interventions to promote engagement with public health programmes and introduced the HENRY programme. Chapter Two described a literature review undertaken to identify previous studies that had tested an intervention to promote engagement with a public health programme. Chapter Three detailed a focused ethnography study that explored factors within the children’s centre context that influenced parent engagement with HENRY. Chapter Four reported on the development of the participant engagement intervention which utilised the findings of the literature review and the ethnography study along with the wider literature. The methods used to evaluate the participant engagement intervention were described in Chapter Five, and Chapter Six provided the results of that evaluation as well as insight into the findings.

7.3 Key findings

7.3.1 Highlighting evidence gap

The literature review identified 12 studies that tested an intervention to promote engagement with a public health programme. Of these, none demonstrated effectiveness for participant enrolment and programme completion, but there was some indication of effect for the use of financial incentives (Dumas, 2010, Hennrikus et al., 2002, Diaz and Perez, 2009, Heinrichs, 2006), manipulated recruitment strategies (Spoth and Redmond, 1994, Winslow et al., 2016, Abraczinskas et al., 2020) and text message reminders (Murray, 2015). Overall, the quality of the studies identified in the review was low. The majority of interventions lacked a theoretical or empirical underpinning, and many of the evaluations were poorly designed. An absence of formative research, logic models and process evaluation were also revealed, confirming that the overall body of research was weak. This review was important for emphasising the gap in the literature around effective methods for promoting engagement with public health programmes. The lack of rigorous research in this field

has also been noted by other authors. For instance, Gonzalez et al. (2018) who undertook a systematic review to identify effective interventions for promoting engagement with parents of children aged two to eight, reporting that none of the retrieved interventions were effective, and that the methodological quality of studies was low, reinforcing that work in this field was much needed.

7.3.2 Implementation barriers to engagement

Given the lack of research in this area, the focused ethnography study (Chapter Three) was important for understanding why some children's centres struggled to engage parents to the HENRY programme. The results of the ethnography confirmed that factors influencing engagement were present throughout the implementation context. In particular, the results highlighted the hierarchical influence at play, with local authority buy-in determining the levels to which HENRY was prioritised and promoted in centres, and the requirement for some centres to adopt a 'targeted' rather than 'universal' approach to recruitment. These findings were important for establishing that some centres did not struggle to engage participants *per se*, but that implementation practices adopted by the centres resulted in many parents being unaware of the programme, or being unable attend if they were not viewed as being in 'need'. This meant that, in order to promote engagement with HENRY, an intervention was needed to change the behaviours of individuals involved in the implementation of HENRY, in addition to changing the behaviours of potential participants. Much of the literature around participant engagement focuses on barriers faced by potential participants (e.g., social and cultural barriers or programme level factors), with a small number describing implementation factors such as methods used to promote programmes (Butler et al., 2020, La Placa and Corlyon, 2014, Mytton et al., 2014). Although these factors are important to understand, without addressing barriers within the implementation context, basic infrastructure and processes that are needed to support engagement, may not be in place (e.g., staff training and a strong 'implementation climate'). As such, the findings of the ethnography study highlighted that a multi-layered intervention is needed to promote engagement, which is of importance to future studies

7.3.3 Intervention development process

The process used to develop the participant engagement intervention (Chapter Four), informed by the findings of the ethnography study, the literature, stakeholder input and BCW guidance, resulted in a logic model describing how the intervention was proposed to promote engagement with HENRY. Given the limitations of other studies in this field, the methods used to develop the participant engagement intervention offer an exemplar for similar interventions. For example, the work undertaken in this study demonstrates the value of using an intervention development approach that ensures decision making processes at each stage are systematic and transparent so that findings can be applied to other studies. The use of formative research to explore barriers and levers to engagement is also clear to inform the intervention aims and design. In addition, the novel approach of targeting behaviours across multiple levels of the implementation context in order to promote participant engagement is likely to be relevant to other interventions and settings. For instance, a recent systematic review identified the importance of gaining head teacher support to successfully implement public health interventions in schools (Herlitz et al., 2020). Therefore, school based implementation interventions, among others, could be developed using a similar approach.

7.3.4. Participant engagement intervention design

The overarching strategy of the participant engagement intervention was to persuade and enable stakeholders involved in implementing HENRY to adopt behaviours that were proposed to promote engagement to the programme. Broadly, this was to be achieved via the provision of knowledge on: what HENRY entailed, how the programme benefitted families that attended, and the expected benefits of adopting the behaviours proposed to promote engagement, which, in turn, was proposed to motivate and enable change. The literature on implementation interventions delivered in children’s centres is small, limiting comparability of the current study with those that are similar. However, as described in Chapter Four, one study described an implementation intervention with similar components, that successfully changed the behaviours of children’s centre managers and staff to promote implementation of fire injury prevention guidelines (Deave et al., 2017, Deave et al., 2014), supporting the design of the participant engagement intervention. Though, one key difference between the intervention developed by Deave et al. (2014) and the participant engagement intervention was that their intervention was delivered with the support of a research team, as opposed to adopting a pragmatic and sustainable approach used here, highlighting the need to balance implementation support with sustainability of the intervention. Another identified study (also described in Chapter Four) consistent with

the participant engagement approach was an intervention developed by Yoong et al. (2019), which successfully promoted compliance of healthy school policies in canteens using APEASE criteria (Michie et al., 2011) to ensure a pragmatic and sustainable design. Therefore, although the participant engagement intervention was not found to be effective, engagement interventions using a similar approach warrant further exploration. A limitation of the participant engagement intervention and BCW approach however, was the lack of consideration given to context during the intervention development phase. Although many of the issues described in Chapter Six (process evaluation results) could not have been foreseen, drawing on implementation theory in addition to the COM-B model of behaviour could have increased the likelihood of the intervention being well delivered and received.

7.3.5 Influence of context on intervention outcomes

A key finding of the participant engagement intervention process evaluation was the influence of context on implementation and behaviour change outcomes. As discussed in Chapter Six (Process evaluation results), these findings support the need for a nuanced and adaptive approach to intervention delivery and evaluation, which is responsive to local context. For example, encouraging commissioners and managers to develop their own engagement activities which might be more achievable within their resource and capacity levels. This approach was successfully used by Matheson et al. (2020) to improve public health systems in New Zealand, by bringing together senior leaders to initiate a united effort to strengthen public health activities. However, as demonstrated by the process evaluation findings, engaging local authorities and children's centres to prioritise engagement efforts where funds and resources are limited is likely to be is a challenge. Yet, where money is being spent on commissioning and delivering public health programmes, investing adequate resources into ensuring they are well attended makes best use of public health funds, and strengthens their impact, thus, having a greater chance of achieving population level change and resulting in cost savings in the longer term. Therefore, future work should focus on exploring how best to engage key decision makers to support investment in engagement, despite challenging conditions (or recognise unstable contexts that are not suitable for research). This could include the provision of definitive data on the effectiveness and cost effectiveness of programmes which is known to increase organisational support for interventions (Aarons and Palinkas, 2007), although, these data are not widely available for public health programmes. Meaningful involvement of end-users in all stages of the research could also promote stakeholder support, and promote a shared interest in achieving positive results (Slattery et al., 2020).

7.4 Main strengths of the thesis

Within each chapter, the strengths of each study have already been described. Therefore, to avoid repetition, only overarching strengths are described here. The overall strength of this PhD is the contribution it makes to the literature around participant engagement with public health programmes. Despite the widely acknowledged issue of low uptake and poor attendance with public health programmes, there is a surprisingly small pool of literature describing efforts to promote these. A further strength is the insight the thesis provides into the context of children's centre delivery of public health programmes. As children's centres are located in the most deprived areas of the country, they are well positioned to promote the health of families that potentially most need their support, thus creating a valuable opportunity to reduce the gap in health inequalities (Institute for Fiscal Studies, 2019). It is therefore hoped that this works highlights the need to adequately support children's centres to deliver programmes such as HENRY. To support this, the work in the thesis has been widely disseminated. Two of the studies included in the thesis have been published in peer reviewed journals (ethnography study and intervention development), along with published papers associated with the trial of the participant engagement intervention and wider work (Stamp et al., 2021, Bryant et al., 2021, Webb et al., 2020, Bryant et al., 2018, Bryant et al., 2017). Results of the ethnography study were fed back to children's centre stakeholders to inform them of target behaviours that were recommended as part of the engagement intervention, to support them to promote engagement. Process evaluation findings have also been disseminated to local authority and public health stakeholders via an online dissemination event.

The work undertaken in the thesis was strengthened by the methods used to underpin and guide each study. For example, the Consolidated Framework for Implementation Research (Damschroder et al., 2009) used in the focused ethnography structured the research, and enabled a focused but in-depth exploration of the implementation context. The Behaviour Change Wheel (Michie 2015) used to guide the development of the participant engagement intervention facilitated systematic and transparent decision making at each intervention development stage. Finally, the theory driven process evaluation approach (Weiss, 1997) enabled key outcomes to be identified that established where the intervention theory of change broke down. These methods facilitated clear reporting at each stage, which strengthened scientific rigour and transferability of the results.

7.5 Main limitations of the thesis

The focused ethnography study successfully identified implementation barriers and levers to engagement that influenced parent enrolment and programme attendance. But, the study was not able to explore barriers and levers from: parents that chose not to attend a HENRY programme, parents that were not already engaged with the children's centre, or those that enrolled on HENRY but stopped attending. One reason for this was a limitation in the design, whereby focus groups were not held with parents that had not attended a programme. Another reason was that none of the families that had dropped out of the HENRY programme volunteered to take part in a focus group, so it was not possible to directly investigate what caused them to stop attending. In the absence of this, parents and staff who did attend focus groups and interviews did offer vital insight into what prevented their friends and families from engaging, or described barriers they had experienced previously, but overcame.

The process evaluation could not explore all potential elements of the logic model due to the potential scale of the research. As such, investigation of facilitator, staff and parent levels of the participant engagement intervention were not explored in detail, therefore their impact could not be confirmed. Instead, the study focused on the commissioner and manager levels of the intervention, as these were proposed to have the greatest impact upon engagement practices. Given what was revealed by process evaluation findings in regards to the children's centre context, it is likely that other levels of the intervention also had a limited effect.

The process evaluation study results did not definitively support or refute proposed mechanism of change, such as whether intervention components successfully influenced capability, motivation and opportunity, as designed. This was to be explored via qualitative interview and data on behaviour change outcomes. However, many members of staff that received the intervention had moved onto new roles by the time the interviews took place, and some interviewees failed to remember any aspect of the intervention. Measurement of behaviour change was hindered by low questionnaire response rates (pre-and-post intervention questionnaires), preventing associations between intervention receipt and behaviour change from being fully explored. These factors, again, were likely attributable to the context. And finally, as previously discussed, a limitation of the intervention development process was the lack of consideration given to anticipated contextual factors that were found to be influential on implementation and organisational support. Given that explicit consideration of contextual factors influencing intervention outcomes is missing from the BCW approach, there is a need for further method development to ensure that this is routinely assessed within the design process.

7.6 Implications for research and practice

In order for public health programmes to achieve population level change, they need to reach enough people (Indig et al., 2017), whilst infrastructure and funding are in place to facilitate engagement practices. The findings of this thesis revealed that achieving organisational and local support for programmes could promote participant engagement. Therefore, engagement interventions should aim to change behaviours across multiple levels within a programme's context. As demonstrated here, the context in which an engagement intervention is delivered is likely, itself, to be complex, thus the development and evaluation of interventions should be guided by local resource levels and stakeholder input. Several lessons have been learned during this thesis. Some implications and recommendations are now discussed.

7.6.1 The value of formative research

The foundations of this work were provided by the results of the focused ethnography study. These findings gave valuable insight into the factors influencing engagement with HENRY, which informed the intervention design. As described in the literature review (Chapter Two), many studies within this field fail to undertake formative research, which has contributed to their limited results.

Recommendation: It is recommended that all studies aiming to promote engagement with a public health programme undertake formative research to understand what the barriers to engagement are, prior to addressing them, including assessing multiple levels of influence throughout the programme's context. Although it is not always feasible to undertake ethnography work, other qualitative methods (such as interviews, observation or focus groups), in addition to stakeholder consultation would offer great insight into where interventions should be directed.

7.6.2 Intervention development approach

The Behaviour Change Wheel provided a systematic and transparent approach to intervention development, enabling clear reporting of methods and results, strengthening transferability of the work. Clearly setting out how each intervention component was expected to work by developing a logic model also helped structure the evaluation, and understand where the theory of change broke down.

Recommendation: In order to develop the literature on participant engagement interventions, others should adopt a similar approach. If the Behaviour Change Wheel does not meet the needs of the project (e.g., in mitigating contextual factors), its underpinning principles can still be adopted, so that decision making processes are transparent, and theory and evidence drawn upon. A logic model should also be

developed which pays attention to the context, and considers how this might impact on causal pathways (Mills et al., 2019). Currently, this approach is underdeveloped.

7.6.3 Process evaluation data collection tools

The design of the current process evaluation could have been strengthened by using more robust measures to assess whether intervention components influenced capability, opportunity or motivation, as proposed. This would have enabled refinement of the underpinning theory of change and contributed to the behaviour change literature. A greater questionnaire response rate would have also enabled better assessment of behaviour change outcomes.

Recommendation: Researchers should draw upon other studies that have successfully assessed mechanisms of change using validated tools (e.g., a validated COM-B questionnaire designed by Keyworth et al. (2020)). Greater questionnaire response rates could be achieved by engaging with end-users to agree on the acceptability of the tools and processes for their use, along with piloting (Steckler and Linnan, 2002). Mediation analysis to establish which behaviour change outcomes are related to which ‘active ingredients’ might also be considered (Bonell et al., 2012).

7.6.4 Implementation context

The political and structural challenges faced by children’s centres and local authorities resulted in the participant engagement intervention not being delivered and received as planned. This hindered performance of target behaviours that were proposed to promote engagement with HENRY.

Recommendation: It is recommended that others consider contextual factors during the intervention development process to establish whether intervention delivery and research is feasible and consider ways that anticipated contextual factors may be alleviated within the intervention design (e.g., by using a method such as the PDSA cycle, as opposed to setting researcher led targets as discussed in Section 6.3). Adopting a delivery approach that is responsive to the programme context could also mitigate unforeseen contextual factors. For example, instead of striving for intervention fidelity, ensuring that key mechanisms are delivered in a manner appropriate to the context. Process evaluations could shift focus from assessing implementation of the intervention, to give greater attention to exploring mechanisms of change, and resulting behaviour change outcomes. Greater organisational buy-in to support intervention delivery and uptake could be achieved by actively involving end-users in all stages of the intervention design and implementation (Voorberg et al., 2015). Piloting individual components of an intervention within a small population, prior to roll-

out, would also enable a preliminary assessment of participant response, so that modification could be applied to promote impact (Craig et al., 2006).

7.6.5 Evaluation of engagement efforts

Where strategies are developed to promote engagement with public health programmes, it is important to evaluate those efforts to ensure that resources are used effectively and to inform future programme delivery.

Recommendation: Rigorous evaluation of engagement interventions should be undertaken. Where it is not feasible to undertake a randomised controlled trial, other evaluation designs could be considered, for example, quasi-experimental studies that are less resource intensive and are well equipped to be undertaken in real world settings (Schweizer et al., 2016). Consistent definitions of engagement (e.g., enrolment, attendance, completion) should also be used to enable greater synthesis of results and to aid interpretation of effects.

7.7 Conclusion

This thesis describes the development and evaluation of a participant engagement intervention aimed at promoting engagement with a public health programme. The intervention did not succeed at promoting parent engagement with HENRY, though, process evaluation findings revealed that contextual factors had hindered its impact. The potential of the intervention to promote engagement, if implemented in different circumstances, is therefore not known.

The findings of the thesis confirmed that implementation factors are influential over participant engagement outcomes. This has so far been relatively unexplored. In order to optimise the impact of public health programmes, infrastructural and financial support needs to be in place to support practices that are beneficial for participant engagement. Without this, programme reach, impact and sustainability are compromised, risking waste of valuable public health resource.

Given the lack of literature around effective interventions for promoting engagement with public health programmes, it is important that programme deliverers and researchers invest in, evaluate and report on engagement efforts. As demonstrated here, even where efforts are unsuccessful at promoting engagement, valuable lessons can be learned.

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List of Abbreviations

APEASE Affordability, Practicability, Effectiveness/cost-effectiveness, Acceptability, Side-effects/safety, Equity

BCT Behaviour Change Technique

BCW Behaviour Change Wheel

CFIR Consolidated Framework For Implementation Research

COM-B Capability, Opportunity, Motivation, Behaviour

HENRY Health, Exercise, Nutrition for the Really Young

PARiHS The Promoting Action on Research Implementation in Health Services implementation framework

PRISM The Practical, Robust Implementation and Sustainability Model

Appendix 1
Focused ethnography study: CFIR observation tool

Observation Template

Date:	
Observer:	
Children's Centre:	

Observations throughout the week can be entered freely on open note pads. This template allows researchers to structure their observations as they happen or after the event. It is based on the Consolidation Framework for Implementation Research and the Theoretical Domains Framework which will both be used to guide observations. However, given the exploratory nature of the ethnographic work, observations will not be restricted to this framework.

New framework templates to be completed each day of each Centre visit

Domain: Characteristics of intervention	
CFIR Construct:	Data:
Intervention Source: Perception of key stakeholders about who has developed HENRY and why?	
Evidence Strength & Quality Stakeholder's perceptions about the quality and validity that HENRY will have the desired outcomes	

Relative advantage Stakeholder’s perception of the advantage of HENRY versus an alternative solution	
Adaptability The degree to which HENRY meets the local needs of the Children’s Centre	
Complexity Perceived difficulty of HENRY (duration, scope, radicalness, disruptiveness, intricacy)	
Design Quality and Packaging Perceived excellence in the way HENRY is packaged	
Cost Cost of the intervention and cost associated with implementing the intervention (investment, supply, opportunity)	

Domain: Outer Setting:	
CFIR Construct:	Data:
Participant Needs & resources: The extent to which parent/families needs are met by HENRY and how barriers and facilitators to meet those needs are addressed and prioritised within the Children’s Centre	

Cosmopolitan: The extent to which the Children's Centre networks with other Children's Centres	
Peer Pressure: Mimetic or competitive pressure to implement HENRY, typically because of other Children's Centres delivering it	
External Policy and Incentives: To spread interventions (including HENRY); external mandates, recommendations, guidelines, pay for performance, public health	

Domain: Inner Setting:	
CFIR Construct:	Data:
Structural Characteristics The social architecture, age, maturity, and size of the Children's Centre.	
Networks & Communications The nature and quality of webs of social networks and the nature and quality of formal and informal communications within the Children's Centre e.g. parents/staff/managers.	
Culture Norms, values, and basic assumptions of the Children's Centre.	

Implementation Climate The absorptive capacity for change, shared receptivity of involved individuals to an intervention and the extent to which use of that intervention will be rewarded, supported, and expected within their organization.	
Readiness for Implementation Tangible and immediate indicators of Children's Centre commitment to its decision to implement HENRY.	
Available Resources The level of resources dedicated for implementation and on-going operations including money, training, education, physical space, and time.	
Access to knowledge and information Ease of access to digestible information and knowledge about HENRY	

Domain: Characteristics of individuals	
CFIR Construct:	Data:
Knowledge & Beliefs about the Intervention Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.	

Self-efficacy Individual belief in their own capabilities to execute HENRY courses of action to achieve implementation goals.	
Individual Stage of Change Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of HENRY.	
Individual Identification with Organization A broad construct related to how individuals perceive the Children's Centre and their relationship and degree of commitment with that Children's Centre.	
Other Personal Attributes A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.	

Domain: Process	
CFIR Construct:	Data:
Planning The degree to which a scheme or method of behaviour and tasks for implementing HENRY are developed in advance and the quality of those schemes or methods.	

Engaging Attracting and involving appropriate individuals in the implementation to HENRY through relevant strategies	
1. Opinion Leaders Individuals in the Children's Centre who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention	
2. Formally appointed internal implementation leaders Individuals from within the Children's Centre who have been formally appointed with responsibility for implementing HENRY such as facilitator, coordinator, project manager, team leader, or other similar role.	
3. Champions Parent Champions	
4. External Change Agents Individuals who are affiliated with HENRY or facilitate HENRY	
Executing Carrying out or accomplishing the HENRY implementation targets.	

Appendix 2
Focused ethnography study: Interview topic guide

1. Can you describe your role in the implementation of HENRY?
2. How engaged are you with HENRY?
3. Does HENRY meet your needs? Is there an alternative?
4. How do you feel about the style/delivery/content?
5. Does this fit with your centre ethos?
6. Can you describe what you perceive to be the evidence base around HENRY?
7. Are there any barriers to delivering HENRY?
8. What sort of impact does HENRY have?
9. After the area/centre began delivering HENRY, were any changes implemented?
10. Who has attended training on HENRY in your area/centre? Why were they selected?
11. In some areas, centres struggle to engage participants to HENRY, why do you think that might be?
12. How important is the HENRY coordinator/HENRY facilitator/centre staff/centre manager to engaging parents with HENRY?
13. Do you monitor recruitment and retention? Why?
14. Are there any goals or incentives for staff to recruit?
15. Do you compare your recruitment and retention rates with any other centres/areas?

Appendix 3
Focused ethnography study: Focus group topic guide

1. How did you learn about the HENRY programme?
2. What made you want to enrol?
3. How many sessions did you attend? If you missed a session why was this?
4. What did you think HENRY was when it was first recommended/you first saw the poster?
5. Did anyone describe HENRY to you before you signed up?
6. In some areas, HENRY struggles to get enough parents to enrol on the course. Why do you think that is?
7. Why you think some families fail to attend after they have enrolled?
8. What did you think about the HENRY sessions/content/delivery?
9. Were there any messages/tasks that you found hard to do or maintain?
10. What qualities are important to you in a facilitator?
11. How did you find group discussions?
12. What did HENRY do for you?
13. Would you recommend HENRY to other people?
14. Could anything about HENRY be improved at all?

Appendix 4
Focused ethnography study: Deductive analysis code list

Code				Description
CFIR Domain		CFIR Constructs		Description (Damshroeder et al.)
i)	Intervention Characteristics	1	Intervention source	Perceptions of whether intervention is externally or internally delivered.
		2	Evidence strength and quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.
		3	Relative advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution
		4	Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.
		5	Trialability	The ability to test the intervention on a small scale in the organization, and to be able to reverse course (undo implementation) if warranted.
		6	Complexity	Perceived difficulty of the intervention, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement.
		7	Design quality and packaging	Perceived excellence in how the intervention is bundled, presented, and assembled.
		8	Cost	Costs of the intervention and costs associated with implementing the intervention including investment, supply, and opportunity costs.
ii)	Outer Setting	9	Patient needs and resources	The extent to which patient needs, as well as barriers and facilitators to meet those needs, are accurately known and prioritized by the organization.
		10	Cosmopolitanism	The degree to which an organization is networked with other external organizations.
		11	Peer pressure	Mimetic or competitive pressure to implement an intervention; typically because most or other key peer or competing organizations have already implemented or are in a bid for a competitive edge.
		12	External Policies and Incentives	A broad construct that includes external strategies to spread interventions, including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.
iii)	Inner Setting	13	Structural characteristics	The social architecture, age, maturity, and size of an organization.

		14	Network and communications	The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization.
		15	Culture	Norms, values, and basic assumptions of a given organization.
		16	Implementation climate	The absorptive capacity for change, shared receptivity of involved individuals to an intervention, and the extent to which use of that intervention will be rewarded, supported, and expected within their organization.
		17	Tension for change	The degree to which stakeholders perceive the current situation as intolerable or needing change.
		18	Compatibility	The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.
		19	Relative priority	Individuals' shared perception of the importance of the implementation within the organization.
		20	Organisational incentives and reward	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary, and less tangible incentives such as increased stature or respect.
		21	Goals and Feedback	The degree to which goals are clearly communicated, acted upon, and fed back to staff, and alignment of that feedback with goals.
		22	Learning climate	A climate in which: a) leaders express their own fallibility and need for team members' assistance and input; b) team members feel that they are essential, valued, and knowledgeable partners in the change process; c) individuals feel psychologically safe to try new methods; and d) there is sufficient time and space for reflective thinking and evaluation.
		23	Readiness for implementation	Tangible and immediate indicators of organizational commitment to its decision to implement an intervention.
		24	Leadership engagement	Commitment, involvement, and accountability of leaders and managers with the implementation.
		25	Available resources	The level of resources dedicated for implementation and on-going operations, including money, training, education, physical space, and time.
		26	Access to knowledge and information	Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.
	Characteristics of Individuals	27	Knowledge and beliefs about the intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.
		28	Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals.

		29	Individual stage of change	Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention.
		30	Individual identification with organisation	A broad construct related to how individuals perceive the organization, and their relationship and degree of commitment with that organization.
		31	Other personal attributes	A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.
	Process	32	Planning	The degree to which a scheme or method of behaviour and tasks for implementing an intervention are developed in advance, and the quality of those schemes or methods.
		33	Engaging	Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role modelling, training, and other similar activities.
		34	Opinion leaders	Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention.
		35	Formally appointed implementation leaders	Individuals from within the organization who have been formally appointed with responsibility for implementing an intervention as coordinator, project manager, team leader, or other similar role.
		36	Champions	Individuals who dedicate themselves to supporting, marketing, and 'driving through' an [implementation]" overcoming indifference or resistance that the intervention may provoke in an organization.
		37	External change agents	Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.
		38	Executing	Carrying out or accomplishing the implementation according to plan.
		39	Reflecting and evaluation	Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.
Parent level facilitators to engagement (Mytton et al.)				Summary of theme
1	Behaviour change			Parents learning new skills
2	Role of deliverer			Trusted or known people recruiting to and delivering programme
3	Group experience			Meeting others, exchanging ideas, feeling safe to talk, peer support
4	Focused message			Tailored sessions that were relevant to parent situations
5	Accessibility			Time and place of programme

6	Incentives	E.g., vouchers, free meals, travel expenses
Parent level barriers to engagement (Mytton et al.)		Summary of theme
1	Behavioural barriers	Parents finding it difficult to change behaviour
2	Programme delivery constraints	Parents not liking style of delivery
3	Participant constraints	E.g., fear of groups, reluctance to talk in group sessions, suspicion of others
4	Complex interventions	Covering too many topics makes course too complex
5	Social and cultural barriers	Parent lifestyle issues and socioeconomic, language, ethnicity and literacy barrires

Appendix 5
Participant engagement intervention: Commissioner overview leaflet

Optimising Family Engagement in HENRY Study: HENRY Optimisation Intervention

HENRY: meeting national and local priorities

As you know, HENRY is a programme delivered in your area which equips parents with the skills and knowledge to provide a healthy start in life for babies and young children – by building their confidence and motivation to make positive changes to their family lifestyle.

The HENRY programme supports delivery of the local health and wellbeing strategy, as well as national public health outcomes, to provide the best start in life and reduce child obesity.

Delivering HENRY programmes also enhances children's centre provision; the HENRY approach to working in partnership with parents, offering an inclusive service, service evaluation and continuous improvement provides evidence that helps centres to achieve an outstanding OFSTED grading.

Aim of the HENRY OFTEN Study

Ensuring that the HENRY programme is delivered as cost-effectively as possible is particularly important in the current economic climate. However, in a prior study we found that only about half of Centres running HENRY programmes recruited at least 8 parents per programme and only 52% Centres reported that at least 75% of parents completed 5 or more of the 8 programme sessions – the national targets for recruitment and retention .

Programmes that attract and retain high numbers of parents are likely to be more cost-effective than those that do not. Research indicates that the delivery costs of a similar programme per child significantly increases (by an estimated £800 per child) in programmes that run with 8 parents compared to those running with 12 parents. Running programmes with only a small number of parents can also negatively affect the group experience, which can lead to a greater number of drop-outs.

We know from experience that engaging parents to attend programmes can be challenging. We have therefore designed an intervention that aims to support Children's Centres to increase parent engagement, as well as retention.

As part of the research, this intervention will be implemented for HENRY programmes running in your area between September 2016 and March 2017. We will then analyse the impact of the intervention on recruitment and retention, enabling us to learn and make informed recommendations to commissioners about how to maximise cost-effectiveness when delivering the HENRY programme – and others.

The HENRY Optimisation Intervention

Researchers from the OFTEN Study spent time in Children's Centres across the country that deliver HENRY programmes talking to parents, staff and managers and learning from different approaches to engaging parents and delivering the programme. Based on our own research, input from a parent advisory group and other

HENRY stakeholders about the factors that appear to have a positive impact, HENRY has designed an intervention to increase parent engagement and retention which consists of the following components:

1. **Re-branded promotional material**

We are aware that many people assume HENRY is a purely a healthy eating course, when in fact, it is actually so much more than that. Therefore, we have changed the current HENRY branding in your area to wording that more accurately describes its content. This new strapline is based on discussions with parents about how they would describe HENRY having been on the programme.

2. **Facilitator refresher training**

HENRY has designed an additional supervision session for facilitators to:

- explore how they can best support Centre staff to promote HENRY accurately and effectively
- polish their facilitation skills so that parents attending the programme feel at ease and get an optimum experience – which we hope will improve group retention.

HENRY has held briefing sessions for coordinators in all the interventions areas (including yours) to support them to deliver this additional supervision session and has provided them with a written session plan.

3. **Re-designed reports**

Evaluating and reporting on the outcomes for families attending programmes is already of great importance to HENRY and commissioners. HENRY will continue to send you an outcomes report at the end of each term to let you know how families have benefited from attending programmes delivered in your area. We will also introduce a new Centre-level dashboard report that captures the headline impact and that can be displayed in Centres to raise awareness of the benefits of the programme amongst staff and parents.

4. **Manager information days**

HENRY has also designed 'manager information sessions' to share the learning about the factors that improve recruitment and retention and help them identify how they could implement these in their Centre. HENRY has held briefing sessions for coordinators in all the interventions areas (including yours) to support them to deliver this information session for managers and has provided them with a written plan for the session.

Your local HENRY coordinator will be inviting all Children's Centre managers and outreach workers to attend this information session over the coming weeks.

Recommendations for local authorities and Children's Centres:

Based on our own research, input from a parent advisory group and other HENRY stakeholders, some of the strategies we will be recommending to managers are detailed below. Your support to managers and Children's Centres in implementing these strategies for programme running between September 2016 and March 2017 will be crucial and will enable us to learn about the impact and cost-benefits of the different strategies.

1. **Taster sessions**

Previous HENRY data suggests that running taster sessions before each programme can increase group retention by nearly 10%.

2. **Allowing self-referred parents to enrol**

We are aware that Children's Centres focus on the most vulnerable families with the greatest needs. However, our research suggests that allowing self-referred parents to enrol alongside referred families avoids stigmatising programme attendance and increases take-up by referred families as well as increasing the overall number of families benefiting from the programme. Recruiting a mix of families with different levels of need also enhances the group experience, leading to greater retention.

3. **Actively supporting peer to peer recruitment**

Word of mouth is a recruitment strategy that has been found to be effective in other public health programmes as it can normalise the programme and be a motivator for change. Our research as part of the OFTEN Study also indicates that parents are more likely to attend programmes that have been recommended to them by other parents. We are therefore asking Centres to implement some simple measures to proactively engage parents as peer recruiters.

During the last HENRY group session, facilitators will talk to parents about peer recruitment and help them think through opportunities to recommend HENRY to other parents, as well as how to talk about the benefits they have experienced. Peer recruiters will be provided with leaflets about the HENRY programme with programme dates to give to other parents.

To maximise the potential of peer recruitment, managers and outreach workers will need to keep in touch with peer recruiters about programme dates etc. and harness their experience, for instance by inviting them to come to taster sessions and talk to other parents.

4. **Increasing the number of staff attending core training**

Limited financial resources and staff time can mean that only Children's Centre staff delivering the HENRY programme have attended HENRY Core Training before going on to the Group Facilitation Training.

Our research as well as wider HENRY experience suggests that embedding HENRY across the Centre by enabling all staff to attend the 2-day Core Training has real benefits. When staff have direct knowledge and understanding of the HENRY approach, they are able to talk much more effectively to parents about what the HENRY programme will be like and what they will gain –and dispel any myths. This means that parents in turn have a clear understanding of what the programme entails, increasing motivation to attend.

Staff who have attended the Core Training will also be able to adopt the principles in other areas of their work (for instance by weaving HENRY messages into other group sessions), benefitting even more families.

The views of staff and parents we spoke to during our research supports a Centre-wide approach to HENRY training. Parents told us that they didn't know what to expect from a HENRY programme despite talking to Centre staff – and reached the conclusion HENRY wasn't for them. Conversely, Children's Centre staff told us they would love to learn more about HENRY to increase their confidence when talking to parents.

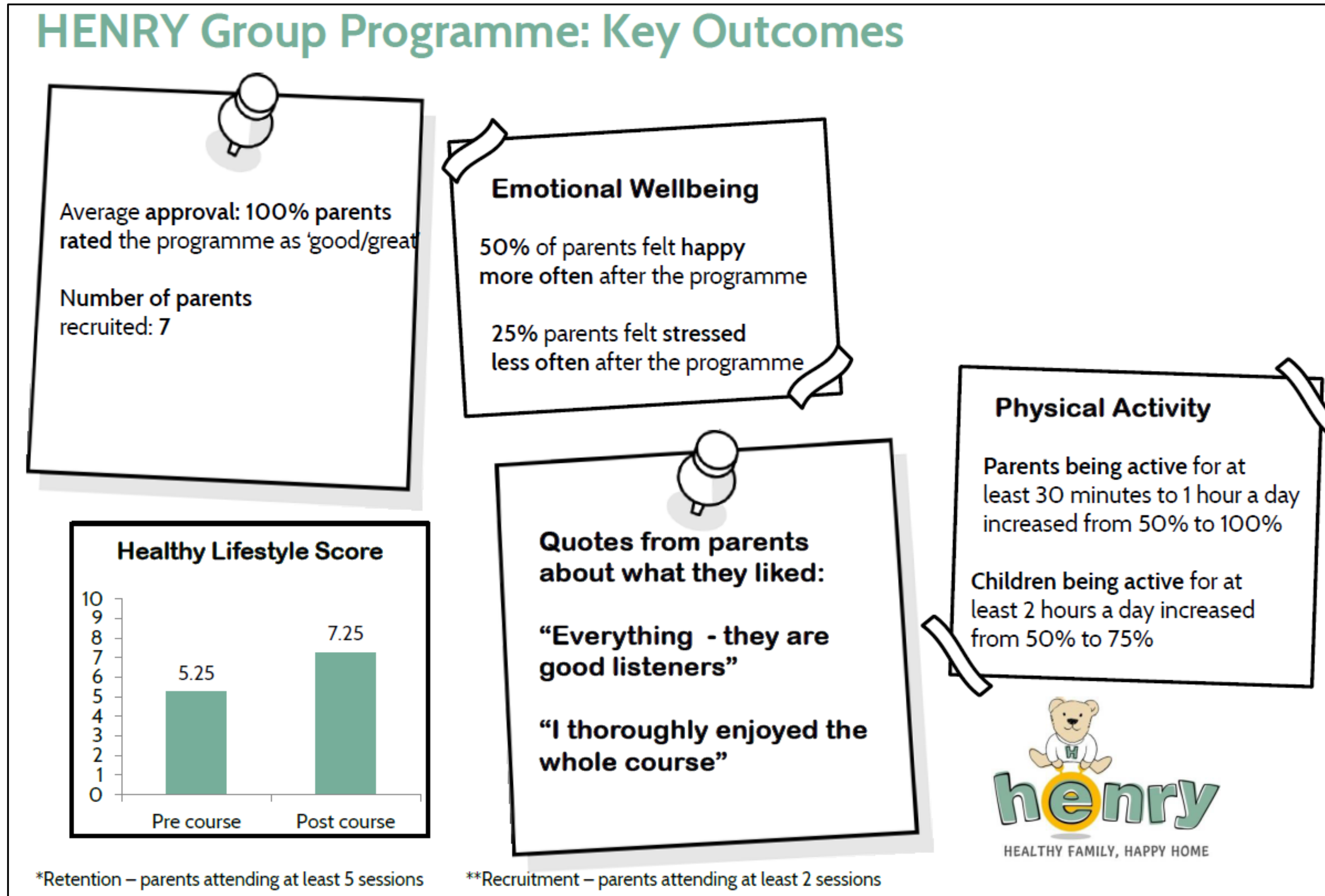
In summary

Given the importance of testing, and learning from, measures to improve cost-effectiveness when delivering programmes that are run in Children's Centres, we hope that you will support Centre managers and staff to implement the optimisation package for programmes running between September 2016 and March 2017.

If effective, we hope that the optimisation intervention will result in increased recruitment and retention for HENRY group programmes running in your areas, resulting in positive family lifestyle outcomes for a greater number of parents.

If you have any feedback or suggestions for us, we would love to hear it. Please contact Wendy Burton; W.Burton@leeds.ac.uk, 0113 343 2771.

Appendix 6
Participant engagement intervention: Dashboard report



Appendix 7
Participant engagement intervention: Manager workshop session overview

Managers' Workshop: Overview

Workshop: 2 hours 45 minutes

	TOPIC	TIME	RESOURCES	FLIPCHARTS
1.1	Warm up	20 mins	Workbooks Attention attractors Collective reward system	*Overview* *Group Guidelines* *Shopping Basket*
1.2	Group Guidelines	10 mins		
1.3	Increasing Profile of HENRY	20 mins	Flipchart pens	*How to incorporate HENRY into* other *programmes and sessions run in Centre* *How to involve staff in promotion of HENRY* *Methods of promoting HENRY in Centre*
1.4	Widening the reach of HENRY	50 mins	Ball to throw Dividers for 3 groups	
	Coffee break	15 mins		
1.5	Planning and Recording	30 mins	Dividers for 2 groups Dashboard Report	On one flipchart: *What helps us to plan a HENRY Group Programme well ahead* *What makes it more difficult to plan ahead* On one flipchart x 2: *Top Ten Tips for Planning* *Benefits of planning*
1.6	Next Steps	10 mins	Leaflets	
1.7	Workshop Review	5 mins	Review forms	
1.8	Ending	5 mins	Small gift (optional)	

Appendix 8
Participant engagement intervention: Facilitator workshop plan overview

Facilitator Workshop Overview

Workshop: 2 hours 45 minutes

	SESSION TOPICS	TIME	RESOURCES	FLIPCHARTS
1.1	Warm up	20 mins	Workbooks	*Overview*
1.2	Group Guidelines	10 mins	Attention Attractors Collective Reward system	*Group Guidelines* *Shopping Basket*
1.3	Recruitment	40 mins	Ball to throw Dividers for 2 groups Pairs dividers Post it Notes	*Benefits of Peer Recruitment for Parents* *Recruitment for Children's Centres* *Opening the Door* *Skills and Resources*
	Coffee break	15 mins		
1.4	Meeting the needs of the group	35 mins	Pairs dividers Dividers for 3 groups Flipchart pens	*Circles of Concern and Influence* *Understanding Behaviour* *Benefits for Parents* *Benefits for Facilitators* *Benefits for Children's Centre*
1.5	Next Steps	15 mins	Leaflets	
1.6	Action Planning and Review	15 mins	Review forms	
1.7	Ending	5 mins	Small gift (optional)	

Appendix 9
Process evaluation: Workshop implementation checklists

MANAGER WORKSHOP IMPLEMENTATION CHECKLIST

Coordinator name:		
Date of course:		
Location:		
Number in attendance:		
Estimated time spent planning and organising:		
Workshop attendance:		
	Y/N	
Manager present from all participating Children's Centres?		*If no, please provide a reason:*
Other staff from participating Children's Centre present?		*If yes, briefly describe:*
Reason for non-attendance identified?		*If yes, briefly describe:*
Planned actions to follow up on non-attendance?		*If yes, briefly describe:*

Workshop delivery:				
Session topic		Activity	Delivered according to handbook (Y/N/Partial)	Comment (if applicable):
1.1	Warm up	Purpose of workshop explained		
		HENRY approach to workshop highlighted		
		OFTEN study explained and logic model reviewed		
		Relevant manager components highlighted		
		OFSTED guidance reviewed		
1.2	Group guidelines	Group activity – group guidelines		
1.3	Increasing the profile of HENRY	Group activity – increasing profile of HENRY		
		Action points completed - increasing profile of HENRY		
		Managers encouraged to share the benefits of Core Training		

		Action points completed - increasing number of staff attending core training		
1.4	Widening the reach of HENRY	Group activity – recruiting referred and self-referred parents		
		Managers invited to think about how they could be more inclusive		
		Group activity – running taster sessions		
		Action points completed – running taster sessions		
		Peer recruitment component explained		
1.5	Planning and recording	Group activity – planning and recording		
		Action points completed – planning programmes regularly in advance		
		Manager encouraged to develop action plan further back in their setting		
1.6	Next steps	Managers reminded about trial confidentiality		
		Changes to paperwork and resources explained		
		Changes to promotional material explained		

1.7	Workshop review	Session evaluation forms completed		
1.8	Ending	Group invited to stand in circle to reflect		

General comments regarding implementation of workshop:
e.g. any sections adapted or missed out

Appendix 10
Process evaluation: Interview topic guide

Commissioner interview topic schedule (intervention and control arm)

Section A: Demographics

1. Can I first of all start by taking some basic demographic information which will help me when analysing the data?

Age range (20-30)(30-40)(40-60)(60+)	
Job role	
Years of experience	
Gender	

Section B: Introductory questions

2. Can you explain to me why your area decided to take part in the OFTEN study?
3. How do you normally try to engage parents with programmes in your area?

Section C: Behaviour change

4. Looking back over the last 12 months, can you describe any changes you made to try to promote parent engagement in your area?

Section D: Context

5. Can you describe any external factors that affected parent recruitment and retention over the last year?

Section E: Theoretical underpinning

During the study, commissioners in areas allocated to receive the optimisation intervention were provided with an information leaflet and termly report on outcomes achieved by families attending HENRY. I would like you to have a quick look and provide your views on this.

Show commissioner level report and leaflet.

6. How does/did this information change your understanding of the HENRY programme?
7. Did/would you change anything related to your HENRY practice after reading it?

8. When designing the optimisation intervention, we wanted to test whether this leaflet and report would influence whether local authorities might be willing to invest more resources in to parent engagement. Can you give me your views on this?
9. During our earlier research, we learnt that some managers in other local authority areas felt that decision making around parent engagement strategies were influenced by the attitudes of their local authority. What do you think about this?
10. If a manager wanted to, for example, allow any parent from the area to enrol on a HENRY programme, irrespective of need, how would you feel about this?
11. If a manager wanted to increase training provision for staff/implement peer recruitment/deliver taster sessions in their centre to assist with parent engagement, would this be possible?

Manager interview topic guide (intervention arm)

Section A: Demographics

1. Can I first of all start by taking some basic demographic information which will help me when analysing the data?

Age range (20-30)(30-40)(40-60)(60+)	
Job role	
Years of experience	
Gender	

Section B: Introductory questions

2. Can you explain to me why your centre decided to take part in the OFTEN study?

Section C: Context

3. Can you describe any external factors that may have positively or negatively affected parent engagement over the last year?

Section C: Behaviour change

4. Looking back over the duration of the study, can you describe any changes you made as a result of taking part in the study?

Section D: Implementation

Questions for managers in intervention arm:

Manager workshop

5. What do you remember about attending the manager workshop?

Dashboard report

6. What did you think of the OFTEN study dashboard report?

If not received: *Show manager to guide discussion*

If yes: *How often/at what point in the study did you receive it? Can you describe what it included?*

7. How did/would you utilise this report, if at all?

Section E: Theoretical underpinning

8. Can you tell me about any of the parent engagement strategies that were recommended to you as part of the intervention?

Run through list of strategies to guide discussion:

- *Promote HENRY more widely in centre*
- *Aim for higher recruitment numbers/allow larger group numbers*
- *Plan HENRY programmes regularly and far in advance*
- *Provide core training to more staff in centre*
- *Allow self-referred parents to enrol*
- *Deliver taster sessions prior to each programme*

9. Can you describe if you tried out any of these strategies, or if you already do them?

Prompt: *What made you want to try them? Why didn't you try them?*

10. Can you describe any external factors that influenced whether you tried out any of the strategies?
11. When designing the manager workshops, we wanted to test whether discussing the possible benefits of the strategies with you during the workshops might encourage you to try them. What are your thoughts on this?
12. When designing the intervention we wanted to test whether increasing the buy-in of commissioners towards HENRY would influence whether you felt able to try the strategies. How do you feel about that?

Manager interview topic guide (control arm)

Section A: Demographics

1. Can I first of all start by taking some basic demographic information which will help me when analysing the data?

Age range (20-30)(30-40)(40-60)(60+)	
Job role	
Years of experience	
Gender	

Section B: Introductory questions

2. Can you explain to me why your centre decided to take part in the OFTEN study?

Section C: Context

3. Can you describe any external factors that affected parent recruitment and retention over the last year?

Section D: Behaviour change

4. Looking back over the last 12 months, can you describe any changes you made to try to promote parent engagement in your centre/area?

Section E: Theoretical underpinning

During the optimisation intervention, managers from areas that were allocated to receive the optimisation were invited to attend workshops delivered by HENRY to discuss ideas with other managers on how to promote parent engagement. We also presented some suggestions for managers to try based on our prior research.

Run through list of strategies to guide discussion:

- Promote HENRY more widely in centre
- Aim for higher recruitment numbers/allow larger group numbers
- Plan HENRY programmes regularly and far in advance
- Provide core training to more staff in centre
- Allow self-referred parents to enrol
- Deliver taster sessions prior to each programme

5. Can you describe if you would try out any of these strategies, or if you already do them for your programmes?
6. Can you describe any external factors that would have influenced whether you tried out any of the strategies?

7. What would encourage you to try out these strategies for your programmes?
8. When designing the manager workshops, we wanted to test whether describing the possible benefits of the strategies to you during the workshop might encourage you to try them. What are your thoughts on this?
9. What level of support would you need from your local authority?
10. When designing the manager workshops we wanted to test whether increasing the level of support commissioners had towards parent engagement strategies would influence whether you would try them. How do you feel about that?

Appendix 11
Process evaluation: Observation prompt

1. Did the deliverer adhere to the session plan?
2. Were the strategies clearly presented by the deliverer
3. Was the deliverer enthusiastic?
4. What was the general ‘spirit’ of the session e.g. upbeat, friendly?
5. Were there any adaptions made?
6. How did the attendees react to the messages being delivered? E.g. were the concepts perceived to be useful/not useful?
7. Were any anticipated barriers or levers discussed?
8. If barriers were discussed, where any possible solution presented?

Appendix 12
Process evaluation: Workshop evaluation form

Manager Workshop - Session evaluation form

Thank you for attending our Manager Workshop. We would be very interested to receive your feedback. Please complete and return before you leave.

1) How would you rate the session overall? (please circle)

Poor	OK	Good	Excellent
1	2	3	4

2) To what extent was attending the session worth your time? (please circle)

Not at all	Slightly	Moderately	Very	Extremely
1	2	3	4	5

3) Please rate the session on the following items (Please circle):

	Very poor	Poor	Fair	Good	Very good
Description of optimisation intervention purpose and aims	1	2	3	4	5
Session content	1	2	3	4	5
Quality of materials and delivery	1	2	3	4	5
Level of participant involvement	1	2	3	4	5
Organisation of session	1	2	3	4	5

4) How useful was attending this session for you for taking back to your work environment?

Not at all	Slightly	Moderately	Very	Extremely
1	2	3	4	5

5) What did you find most useful about today?

…………………………………………………………………………………………

…………………………………………………………………………………………

6) What did you find least useful about today?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

7) To what extent can you apply the information you received in your centre? (Please circle)

Not at all	Slightly	Moderately	Very	Extremely
1	2	3	4	5

8) Overall, do you think of the parent engagement strategies that were recommended to you were: (Please circle)

Very poor	below average	Average	Above Average	Excellent
1	2	3	4	5

9)

Did we miss anything out that you feel might increase parent engagement?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

10) Do you foresee any barriers to implementing any of the strategies or attending a similar session in the future?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

11) Would you recommend the session to other managers? (Please circle)

Yes No Uncertain

12) Do you have any other comments?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

Thank you for your time

Appendix 13
Process evaluation: Pre and post intervention questionnaire

1. **The number of staff working in your Children's Centre is:**

…………………………………

2. **The number of current staff that have attended HENRY Core Training* is:**

………………………………..

*HENRY Core Training is a 2 day course which covers the principles and practice of the HENRY approach to tackle child obesity

3. **The number of staff that have attended Group Facilitation Training* is:**

………………………………..

*Training that extends beyond HENRY Core Training to receive accreditation to deliver HENRY group programmes

4. **In the past 12 months, the members of staff that have attended HENRY Core Training are:** (please tick all that apply)

Manager/deputy manager ☐

Team leader/senior early years worker/room leader ☐

Outreach worker/family support/ Children's Centre worker ☐

Early years worker/nursery nurse ☐

Reception/admin/finance ☐

Health professional based at the Centre ☐

Other, please state………………………………………………….. ☐

Other, please state……………………………………………......... ☐

Don't know ☐

	Never	Rarely	Some times	Often	All the time	Don't know
Manager/deputy manager	○	○	○	○	○	○
Team leader/senior early years worker/room leader	○	○	○	○	○	○
Outreach worker/family support/ Children's Centre worker	○	○	○	○	○	○
Early years worker/nursery nurse	○	○	○	○	○	○
Reception/admin/finance	○	○	○	○	○	○
Health professional based at the Centre	○	○	○	○	○	○
Other, please state…………………………………………………….	○	○	○	○	○	○
Other, please state………………………………………………………	○	○	○	○	○	○

5. In the past 12 months, your Centre used the following methods to promote HENRY: (please tick)

	Never	Rarely	Some times	Often	All the time	Don't know
Engaging with health professionals e.g. GP, midwives	○	○	○	○	○	○
Family fair/fun day	○	○	○	○	○	○
Local community groups	○	○	○	○	○	○
Leaflets/posters/display boards	○	○	○	○	○	○
Adverts in local papers	○	○	○	○	○	○
Social media	○	○	○	○	○	○
Other, please state……………………………………..........	○	○	○	○	○	○
Other, please state…………………………………………………………	○	○	○	○	○	○

6. **In the past 12 months, the following members of staff in your Centre were involved in the promotion or implementation of HENRY:** (please tick)

   For example; talking to parents about HENRY, creating a display board, helping to plan taster sessions

7. **In the past 12 months, HENRY principles or practices were incorporated into other sessions delivered at the Centre:** (please tick)

   For example; Using collective reward systems, utilising HENRY resources e.g. books or

Never	Rarely	Sometimes	Often	All the time	Don't know
○	○	○	○	○	○

   charts, or including 'family time' activities

8. **In the past 12 months, the following members of staff incorporated HENRY principles or practice into their daily practice:** (please tick)

   For example; adopting a solution focused approach, promoting sociable eating, encouraging parents to explore issues and set goals

	Never	Rarely	Some times	Often	All the time	Don't know
Manager/deputy manager	○	○	○	○	○	○
Team leader/senior early years worker/room leader	○	○	○	○	○	○
Outreach worker/family support/ Children's Centre worker	○	○	○	○	○	○
Early years worker/nursery nurse	○	○	○	○	○	○
Reception/admin/finance	○	○	○	○	○	○
Health professional based at the Centre	○	○	○	○	○	○
Other, please state………………………………………………….	○	○	○	○	○	○
Other, please state…………………………………………………	○	○	○	○	○	○

9. **In the past 12 months, self-referred* parents were encouraged to enrol on the HENRY group programme:**

Never	Rarely	Sometimes	Often	All the time	Don't know
○	○	○	○	○	○

*Self-referred meaning that a parent requests to enrol after becoming aware of HENRY, rather than them being identified as needing to attend by a member of staff

10. In the past 12 months, parents that attended HENRY were actively encouraged to recommend the programme to their peers:

Never	Rarely	Sometimes	Often	All the time	Don't know
○	○	○	○	○	○

11. In the past 12 months, a HENRY programme was delivered at your Centre:

Not delivered	Once	Twice	Three times/ every school term	More than three times
○	○	○	○	○

12. In the past 12 months, HENRY taster sessions were delivered at your Centre either as part of the programme or before the programme started:

Not applicable, HENRY did not run	Taster session not delivered	Once	Twice	Three times/ every school term	More than three times
○	○	○	○	○	○

13. In the past 12 months, HENRY programmes were usually planned in advance approximately:

Not applicable, HENRY did not run	Less than one week in advance	One month in advance	3-6 months in advance	9-12 months in advance	Longer than 12 months in advance
○	○	○	○	○	○

End of Questionnaire

Appendix 14
Process evaluation: Children's centre characteristic questionnaire

1. How many staff work in your children's centre?

2. How many staff have attended HENRY core training in the last 12 months?

3. How many staff have attended HENRY facilitator training in the last 12 months?

4. How would you describe how your centre is resourced (tick all that apply)?

Local authority	
Private provider	
National charity	
Local charity	
NHS	
Education institute	
Other, please describe:	

5. Have you experienced any funding reductions that have limited your ability to deliver HENRY during the study?
6.

Yes	
No	

If you would like to, please describe……………………………………………………
……………………………………………………………………………………………

7. Is your children's centre a multiagency/integrated services centre?

Yes	
No	

8. How many licenced/commissioned* programmes do you run in your centre?
programmes which are externally developed and delivered by trained facilitator

Number

Comments……………………………………………………………………………
……………………………………………………………………………………………

9. Which activities do you offer in your centre? (tick all that apply)
10.

Antenatal education	
Breastfeeding support	
Diet and lifestyle programmes	
English language courses	
Certified courses e.g. childcare	
Mental health support	
Parenting programmes	
Baby sensory sessions e.g. baby massage/baby sensations	
Other	

If yes, please describe…………………………………………………………………………..
……………………………………………………………………………………………………..

11. Is your centre part of a hub or cluster?

If yes, please describe…………………………………………………………………………..
……………………………………………………………………………………………………

12. Do you manage any other children's centres?

Yes	
No	

If yes, how many……………….

13. How long have you managed this centre?

Less than 1 year	
1-5 years	
5+ years	

14. What is your highest qualification level?

None	
NVQ 0-5	
Degree	
Higher degree	

15. Have you attended HENRY core training?

Yes	
No	

16. Is HENRY delivered internally by children's centre staff or externally?

Internally	
Externally	
Both	

If both, please provide detail of how this is divided: ....

………………………………………………………………………………………………….
………………………………………………………………………………………………….

17. What is the profession of facilitators that deliver HENRY in your centre?

	Y/N	How many?
Children's Centre worker		
Family support/outreach worker		
Health visitor		
Dietician/nutritionist		
Other		

If other, please describe……………………………………………………………………
……………………………………………………………………………………………………..