From complex interventions to complex systems: towards a better understanding of school health improvement

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Summary

Interventions to improve young peoples' health are commonly delivered via schools. Challenges in changing the functioning of complex school systems are commonly underestimated and recognition is growing that interventions cannot be described in isolation from the contexts they attempt to alter. However, school health research has typically paid less attention to understanding schools' current orientations toward health improvement than to attempts to introduce change.

This thesis analyses data from a survey of schools to explore variability in their responses to school-level health needs data in terms of its discussion, distribution and perceived likelihood of impact on health improvement. It then employs ego social network analysis, focused on Wellbeing Leads within four case study schools, to identify potential explanations for variability between schools, before undertaking semi-structured interviews with staff, students and parents within each case study school to qualitatively explore health-related system functioning.

Results highlighted the potential role of staff seniority in explaining schools' variable engagement with feedback. Highly organised structures with allocation of responsibility for wellbeing to a member of senior management, systematisation of dedicated wellbeing roles, a high level of brokerage and embeddedness of outside agencies within school systems were characteristics of the more engaged case study schools. These factors were found to contribute to the orientation of school systems towards health in terms of engaging parents, implementing Personal and Social Education and promoting a healthy school ethos.

By examining system functioning through a complex systems lens, whilst layering theory within this to facilitate its practical application, and employing mixed methodology, this thesis furthers our understanding of how variance in existing school system dynamics may impede or facilitate efforts to respond to student health needs. This higher level of understanding could be utilised to design complex interventions, which work with the system to achieve change.

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1 Introduction

1.1 Background and aims

Secondary schools are key settings for adolescent health improvement as most staff and children spend a large proportion of their waking hours there and, therefore, form a 'captive audience' (Langford et al., 2014; Wichstrøm, von Soest & Kvalem, 2013). There is growing evidence that changing school environments, or interventions targeting multiple levels, such as those underpinned by the World Health Organization (WHO) Health Promoting Schools (HPS) framework, can influence young people's health (Langford et al., 2014). There is also growing recognition that health improvement actions within settings such as schools need to be tailored to the current situation within the system, in terms of the extent of current health "problems" and the mechanisms through which they are sustained.

Recognition is growing that interventions cannot be described in isolation from the contexts they attempt to alter. Moreover, interventions simultaneously represent attempts to displace problematic practices, and introduce new ones. However, narrow definitions of interventions centering around core components have tended to focus only on the second half of this process (Michie, Hyder, Walia & West, 2011) . That is, school health research has typically paid less attention to understanding schools' current orientations toward health improvement than to attempts to introduce change. A Complex Adaptive System (CAS) is a dynamic network of many diverse agents and characteristics, constantly acting and reacting to other agents' behaviour, generating emergent system characteristics, which in turn exert influence on individual behaviour (Keshavarz, Nutbeam, Rowling & Khavarpour, 2010). Hawe et al. (2009b) argue that interventions represent attempts to disrupt the functioning of CASs such as schools, representing events in their history which may become embedded or wash out depending how well system dynamics are understood. Prior to attempting to introduce change within a CAS, it is vital to understand how such systems currently function. Thus, this thesis will use CAS thinking as a framework to understand structures and processes to support health improvement within schools. It will also employ mid-range theoretical frameworks within this broad framework.

The overall aims of this research project are to explore the variance of health improvement processes and system functioning within different school contexts through conceiving schools as CASs. This thesis also takes the opportunity of the inception of a new academic and practice partnership-based collaborative research network in Wales, applying a complex systems lens to understanding how schools' existing structures and practices give rise to variability in initial engagement with this network. The School Health Research Network (SHRN) is an infrastructure for school-based health improvement research in Wales, which had a membership of 69 schools at the time of data collection, but now involves more than half of the secondary schools in Wales (n>115). The network is a partnership with Welsh Government, Public Health Wales, Cancer Research UK and Cardiff and Vale University Health Board and it collects survey data every two years on the student level behaviours relating to the health topics set out by the Healthy Schools Scheme. These data are then utilised to provide schools in the network with individualised health reports detailing the health behaviours of their students.

1.2 Research design

Within this thesis, a survey was conducted of all schools who were members of SHRN to measure the extent of schools' engagement with feedback in the form of SHRN health reports. Embedded within this, a multiple case design was utilised whereby four exploratory case studies were undertaken to enhance understanding of how health improvement activity is embedded within complex adaptive school systems and how this varies by context. An exploratory case study design was utilised as this has been identified as a flexible and effective method for building knowledge about a phenomenon on which limited research has been conducted (Yin, 2003). When aiming to answer research questions using a case study, it is likely that multiple data sources will be required to address all aspects of the research question effectively and to produce a complete picture (Gillham, 2000), resulting in an evidence chain (Yin, 2003). Mixed methods studies are required to transcend the limitations of both qualitative and quantitative methodology (Bryman, 2006b). Although case studies are primarily concerned with qualitative inquiry, quantitative data sets are often utilised. Critical realism bridges the gap between quantitative and

qualitative paradigms, which have often been polarised within extreme paradigms of positivism and interpretivism. Moreover, CAS thinking can provide an ontology to accommodate both approaches and combine them in a meaningful way (Haggis, 2008).

The methods employed within these case studies were ego network analysis of Wellbeing Leads to explore health-related social network structures and qualitative semi-structured interviews with school staff, students and parents, a Healthy Schools Coordinator and the SHRN Network Manager. These qualitative interviews were used to contextualise survey and ego network data, as well as to understand system functioning in relation to health and how this is expressed in terms of health improvement practice in schools.

1.3 Overview of chapters

Chapters 2 and 3 are literature review chapters. Whilst the entirety of Chapter 3 will be dedicated to CAS thinking, Chapter 2 will focus on empirical literature around the implementation of school health improvement activity. It will then provide an overview of some potentially useful theoretical frameworks that have been employed in school health research. Chapter 3 will add a complexity lens to the problems outlined in Chapter 2. CAS thinking will be discussed in terms of partnership working in schools and mapping the context of, implementing change in and designing and evaluating complex interventions in a school setting. It will also outline the extent to which theories fit within a complex systems framework. Chapter 4 outlines the research design employed within this thesis as well as elaborating on its methodological approach, including the ontological and epistemological stance taken and the merits of employing mixed methods.

Chapters 5 to 7 present thesis findings. Chapter 5 explores the health context in Welsh schools, within which the case study schools sit. It both qualitatively and quantitatively explores the permeation of the SHRN health reports, both within network schools as a whole and individually within each of four case study schools.

Chapter 6 then moves on to explore system structure and functioning within case study schools and how this may lead to variation in the permeation of the SHRN health reports. It first explores the health and wellbeing-related ego social networks of school Wellbeing Leads, before qualitatively exploring stakeholder perceptions of these health and wellbeing-related team structures, allocation of the role of Wellbeing Lead to the Senior Management Team (SMT) and student voice.

Whilst Chapters 5 and 6 focus upon understanding system functioning and how this relates to level of engagement with the SHRN health reports, Chapter 7 marries these by qualitatively exploring how current practice is facilitated or impeded by system functioning. Furthermore, this chapter explores the extent to which this is aligned with the HPS framework and school engagement with the SHRN health reports. The chapter begins by providing a discussion of the actions that case study schools have implemented, which are in line with school engagement with the SHRN health reports and the HPS framework's aim of integrating health into the curriculum. Next the chapter applies this approach to the creation of a healthy school ethos and the level of engagement with families and the community. The extent to which these actions are facilitated or limited by the structures outlined in Chapters 5 and 6 will be discussed throughout. The thesis concludes in Chapter 8 with a discussion of the implications of these results for mapping the context of, implementing change in, designing and evaluating complex interventions in school systems.

2 Understanding school context and implementation of interventions to improve school health

2.1 Introduction

Secondary schools are key settings for adolescent health improvement as most staff and children spend a large proportion of their waking hours there and can be reached as a 'captive audience' (Langford et al., 2014; Wichstrøm et al., 2013). However, while historically, schools have often been used as settings for health improvement for this reason, much emphasis has in more recent years turned to moving beyond "intervention within settings" to "settings-based intervention". That is, viewing settings as having the potential to positively and negatively affect health, and focusing on changing the setting to make it more conducive to health, rather than simply delivering interventions to individuals within a setting. There is growing evidence that changing school environments, or interventions targeting multiple levels, such as those underpinned by the WHO HPS framework, can influence young people's health (Langford et al., 2014). This framework, and the broader literature on settings approaches rooted in Ottawa Charter principles, emphasise a need to understand how system level changes can be obtained to influence multiple health related outcomes simultaneously. This may help to overcome potential problems associated with the need to implement multiple potentially conflicting interventions within the same system. There is also growing recognition that health improvement actions within settings such as schools need to be tailored to the current situation within the system, in terms of the extent of current health "problems" and the mechanisms through which they are sustained. For example, actions focused on combating mechanisms such as substance use norms may be pertinent in some schools, though entirely redundant in others.

However, there remains something of a disjuncture between what "works" and what schools are most able to deliver; while changes to educational curriculum can be made relatively easily, attempts to reorient whole school systems toward health have often not always been fully successful (Langford, Bonell, Jones & Campbell, 2015).

Recognition is growing that interventions cannot be described in isolation from the contexts they attempt to alter, and that interventions simultaneously represent attempts to displace problematic practices, and introduce new ones. However, narrow definitions of interventions centred on the new components to be delivered have tended to focus only on the second half of this process (Hawe et al., 2009b). That is, school health research has typically paid less attention to understanding schools' current orientations toward health improvement than to understanding attempts to introduce change.

Much health and wellbeing-related, as well as non-related, work which may have both a positive and negative effect on health and wellbeing, is currently being implemented within these systems. However, the international application of this is highly diverse, so attempts to affect change in school environments must take account of these highly variable starting points, and understand how best to harness pre-existing structures and resources. The current chapter will draw upon empirical literature to discuss the importance of and challenges in the implementation of school health improvement activity. It will then provide an overview of theoretical frameworks relating to structure and agency and discuss their potential utility for understanding school's current orientations towards health improvement. This will aim to provide context and justification for the research questions, methods and theoretical frameworks employed within this thesis.

2.2 Why is school health improvement important?

2.2.1 Adolescence as a key phase in the life course for health

Secondary schools are key settings for adolescent health improvement (Jourdan, Samdal, Diagne & Carvalho, 2008; Langford et al., 2014). Schools provide a viable setting for the delivery of universal interventions, opportunities for which are not available after adolescence as young peoples' trajectories diversify. Moreover, behaviours such as physical inactivity and substance use, as well as emotional wellbeing, worsen during adolescence (Elgar et al., 2015; Hanson & Chen, 2007; Viner et al., 2012). Attitudes and health behaviours established during adolescence have been shown to track into adulthood (Kelder, Perry, Klepp & Lytle, 1994). During adolescence, individuals are less resistant to change compared to during

adulthood (Kelder et al., 1994). This suggests that intervening in secondary schools presents a good opportunity to potentially improve young people's health throughout the life course. Healthy habits have been found to track into adulthood, thus increasing the likelihood of positive health and wellbeing as well as decreasing the risk of disease development, such as cancer or coronary heart disease (World Health Organization, 1986).

2.2.2 Link between education and health

Due to the pressures on schools from regulatory bodies and educational policies to attain high levels of academic achievement, core subjects such as Mathematics, Science and English are often perceived as core business, leaving little time for health programmes to be effectively implemented (Bonell et al., 2014). Currently academic achievement is monitored closely and schools are under immense pressure to perform in this field, whilst health outcomes, such as curriculum time spent in Physical Education (PE) is not currently monitored in England by Ofsted, the English schools' inspection authority (Weiler, Allardyce, Whyte & Stamatakis, 2013), and makes up a small part of assessments by ESTYN, the Welsh schools' inspection authority. In addition to this, schools are often overwhelmed with information regarding health and education initiatives and research programmes, thus forcing them to develop organised ways of prioritising responses to information and programmes related to the core business of the school.

Evidence to support schools' perceptions of education as core business comes from Walton et al. (2012). When interviewed regarding nutrition policy in schools, key stakeholders reported the role of the school in promoting healthy nutrition to be limited by the perception that educating children is the primary responsibility of schools (Walton et al., 2012). Thus, it is likely that education may have been their main priority when it came to school policies. However, there is strong evidence to show the link between health and learning capacity (Powney, Malcolm & Lowden, 2000) as well as academic outcomes (Littlecott, Moore, Moore, Lyons & Murphy, 2015). Moreover, Flaschberger et al. (2013) investigated teacher learning in a regional health-promoting schools network in Austria and concluded that in order to improve teacher learning and connectivity, health promotion must be linked with the

core aims of schools, such as educational outcomes. Evidence has shown that health promotion in schools can lead to positive, cost effective health improvement (Bonell et al., 2013; St Leger, 1997; Wells, Barlow & Stewart-Brown, 2003) and improve the educational outcomes of children alongside this (Leurs et al., 2005; Littlecott et al., 2015). Further evidence to support a symbiotic relationship between health and education is that factors such as school connectedness have been shown to have a positive effect on outcomes in both of these areas (Chapman, Buckley, Sheehan & Shochet, 2013; Waters et al., 2012). A recent study by Littlecott et al. (2015) demonstrated a longitudinal link between breakfast consumption and a concrete measure of educational attainment in 9-11 year old children.

However, evidence regarding the link between health and educational outcomes is not unambiguous. For example, many reviews and evidence syntheses have shown mixed findings with regard to behaviours such as physical activity and diet. For example, a review of breakfast consumption and educational outcomes concluded that many research studies were of insufficient quality with few adopting longitudinal designs, including large sample sizes, controlling for confounding variables or using validated measures of academic performance (Adolphus, Lawton & Dye, 2013). A further recent review concluded that there was insufficient evidence to make conclusions regarding this relationship (Public Health England, 2013, 2014). Moreover, whilst the short term cognitive benefits of physical activity have been established, Taras et al. (2005) concluded that there is a paucity of evidence investigating its link with educational outcomes. In their review, Singh et al. (2012) only included two high-quality research studies out of 14. Thus, whilst concluding that physical activity is positively related to children's academic performance, they highlighted a need for further research to confirm this (Singh et al., 2012).

Further to this mixed evidence, a review of school-based health interventions by Langford et al. (2014) found outcomes such as attendance or academic performance were scarcely reported. This rendered it impossible to draw conclusions regarding a link between school-based health interventions and educational outcomes. Therefore, while there is observational evidence that links health and educational outcomes, due

to a lack of measurement, there is a paucity of evidence showing that intervening to change health can influence education. This demonstrates a need for more quality evidence to establish whether a link exists between health and education (Bonell et al., 2015; Littlecott et al., 2015).

2.2.3 School effects on education

Much research has focused on school effects on students' education. In statistical terms, school effects refer to between-school variance in student outcomes, explained by contextual differences between schools, rather than compositional differences between students within schools (Raudenbush & Bryk, 1986). In other words, the term refers to the value that a school adds over and above what would be expected according to the characteristics of their intake, as opposed to a direct comparison across schools of their overall levels of health and educational outcomes (Bonell et al., 2013). This, therefore, highlights the naivety of 'league table thinking' whereby schools are directly compared without consideration of the characteristics of their intake.

Historically, in line with the core aims of schools, school effects research has focused upon educational outcomes (West, Sweeting & Leyland, 2004). Evidence demonstrates that student composition, such as socioeconomic status, is one of the most important factors influencing the variance in educational performance between schools, over and above the role of context (Opdenakker & Damme, 2007; Palardy, 2013; Willms, 2010). Despite this, an extant literature demonstrates that schools can also have an effect on educational outcomes, which is independent of the characteristics of their students, such as socioeconomic status (Rutter, 1982; Rutter & Maughan, 2002; West et al., 2004). School effectiveness research aims to understand the factors which predict school effects, often through comparing schools of differing levels of effectiveness. This area of research has consistently found strong educational leadership, high expectations of students, an emphasis on basic skills, a safe and orderly climate and frequent student progress monitoring to be important factors which promote school effectiveness related to educational outcomes (Creemers, 1996).

2.2.4 School effects on health

While, as described above, much school effects research has focused on education, it has also been posited that there are school effects on health (West et al., 2004). One of the first longitudinal studies focusing on school effects on health outcomes, whilst controlling for a range of potential confounding factors, was conducted by West (2004). Results showed wide variation in smoking, drug use, alcohol intake and diet between secondary schools, with school effects accounting for more of this variance within the younger age group (2-9%). This study also showed student-teacher interaction, school ethos and parental involvement to be important factors predicting variability in outcomes between schools (West et al., 2004). Further to this, Moore et al. (in press) found that staff-student relationships were associated with both health outcomes and socioeconomic status, thus demonstrating the importance of fostering a supportive environment within schools. This is supported by Jamal et al. (2013) who conducted a systematic review and meta-ethnography of qualitative research. They found that staff-student relationships are critical for student wellbeing and avoidance of risk (Jamal et al., 2013).

Aveyard et al. (2004) found that 14% of differences in smoking prevalence between secondary schools (age 11-18 years) could be explained through value added by schools. When analysed by year group, value added by schools explained a higher percentage of the variance in smoking within the younger year groups. This could be explained by a decreased influence of school on students' lives as they get older, in line with the established decrease in parental influence (Aveyard et al., 2004). Bonell et al. (2013) concluded that studies focusing on school effects were often based in the US and UK and based on substance use, thus highlighting the need for more evidence in a range of locations and health outcomes. The existing literature around school effects demonstrates that schools themselves can exert an independent effect on health behaviours regardless of the characteristics of their student body, such as socioeconomic status. Hence, health interventions represent deliberately initiated processes and actions which seek to activate the potential positive influences of schools on health, and limit their more adverse effects. Interventions will interact with a diverse range of pre-existing activity across schools, which act to impede or facilitate its integration and effects.

2.2.5 Systematic reviews of school-based interventions and school effects

Recent systematic reviews have called for the need to move away from individualistic interventions to focus upon the whole school system, with the inclusion of aspects such as policy, environment, social relations and overall organisation (Fletcher, Bonell & Hargreaves, 2008). For example, Langford et al. (2014) conducted a recent Cochrane systematic review of 67 trials investigating the effectiveness of interventions based on the WHO HPS framework. They included studies that combined curriculum development, environmental change and family engagement to target discrete aspects of health and wellbeing among students. There was evidence to suggest this approach can have a positive effect on some areas of health and wellbeing, including body mass index, physical activity, fruit and vegetable consumption, cigarette use, and bullying. The review also found tailoring, alignment with core aims of schools, increasing ownership through coproduction and the provision of ongoing support and training were essential elements of interventions.

Meanwhile, Bonell et al. (2013) conducted a systematic review of the effects of school environment on student health, finding lower rates of substance use among schools with higher attainment and attendance. They also found that the value added in terms of educational outcomes and attendance are viewed as proxies for school culture, whereby authoritative schools are more likely to have a higher level of control which students can relate to. This may result in a higher level of student commitment leading to an increased likelihood of positive health outcomes (Markham & Aveyard, 2003).

Moreover, a review by Fletcher et al. (2008) investigating school effects on drug use concluded that there is a causal association between modifying the school environment to increase participation, improve relationships and ethos and reduced drug use, particularly for boys. This was supported by a cross-sectional survey which found an association between value added education and reduced risk of drug and alcohol use (Bisset, Markham & Aveyard, 2007). Studies included those focusing on the effects of the provision of teaching and pastoral support, policies and the school campus. This review found lower rates of substance use among schools with higher attainment and attendance, although findings on alcohol and smoking were mixed.

Findings relating to restrictive policies, such as a smoking ban on school premises were mixed, with a significant association observed in Germany (Piontek et al., 2008) between such policies and reduced smoking, but not in the US and Australia (Evans-Whipp, Bond, Ukoumunne, Toumbourou & Catalano, 2010).

This is further supported by Hallingberg et al. (2016) who found no association between smoking policies and smoking prevalence, but an association between restrictive smoking policies and cannabis use. The authors concluded that this was due to the low prevalence of smoking, and growing non-smoking norms among adolescents in the UK, with a wide range of legislation contributing to a widespread denormalisation of smoking. This is supported by the fact that an earlier study in the same country had demonstrated effects of school policies on smoking (Moore, Roberts & Tudor-Smith, 2001). Thus, these findings indicate that changes to the school environment can influence substance use, but that the correspondence between actions and outcomes is highly contingent across time and space (Bonell et al., 2013).

The reviews outlined above focus upon school effects and demonstrate a move towards more comprehensive interventions which aim to change structural aspects of the school environment. However, many systematic reviews have been conducted to summarise and collate results of more simplistic school-based health improvement interventions. For example, Brown and Summerbell (2009) conducted a systematic review of the effectiveness of school-based diet and physical activity interventions on Body Mass Index (BMI). They found that out of 39 included studies, 12 showed a significant difference in BMI between the intervention and control groups either as a whole or for either girls or boys, whilst one showed a significant decrease in BMI, but did not include a control group. Out of these 13 studies, three targeted curriculum only and three school environment only, with the rest consisting of a combination of two or three of environment, curriculum and family involvement. In fact, only one study reported targeting all three of these factors.

A further systematic review looking at school-based programmes to prevent substance misuse found that studies were mostly curriculum-based, with two face to

face brief interventions. They found the most positive results were for the Unplugged curriculum-based programme, with a significantly decreased prevalence of drunkenness and tobacco use (Agabio et al., 2015). However, no measure of risk of bias was calculated (Agabio et al., 2015). This demonstrates that many school-based health interventions remain comparatively simple, aiming to make changes to small discrete parts of the system, as opposed to fully engaging and changing system functioning.

Dobbins et al. (2013) studied school-based physical activity interventions. This systematic review included 43 studies, 15 of which included an education, school environment and family involvement component, Findings showed small positive effects on physical activity, with a moderate to high risk of bias within the studies. The inclusion of several studies targeting multi-components suggest a move towards less simplistic interventions. A settings approach targets multiple levels and acknowledges that within a system, such as a school, there is a complex interaction of factors that impact upon health (Rowling & Jeffreys, 2006). Therefore it may be that, despite targeting multiple levels and components, interventions may not be successfully integrated into the system due to the lack of understanding of system functioning.

Waters et al. (2014) published a systematic review focusing upon interventions for preventing obesity in children. Within this review they conducted a meta-analysis of 37 studies and 27,946 children finding that overall the included programmes were effective at reducing adiposity, particularly among 6-12 year old children. Out of the 55 included studies, 38 were school-based and 12 of these 38 included curriculum, environment and family-based components to their interventions. Again, the studies within this review were based upon discrete components, concluding with recommendations for potentially effective intervention components, such as inclusion of healthy eating in the curriculum and improving the nutritional quality of food sold in the canteen.

2.2.6 Acknowledging context within school-based interventions

The dominant approach to reviewing school-based intervention research often involves aggregation of effects across studies, rather than focusing on how actions produce differential effects according to their contexts of implementation. This has, to date, perhaps lent itself to a somewhat reductionist view of school-based interventions. This risks a view of interventions in which discrete components can be slotted into each individual school to elicit the same effect in each context, with limited theorisation of how each intervention will interact with school systems and what systems and practices they aim to displace. Dominant definitions of complex interventions, such as that outlined by the Medical Research Council guidance, emphasise the role and importance of individual intervention components in isolation from their context (Anderson, 2008; Craig et al., 2008). This focus on intervention components underplays the dynamic nature of the production of intervention effects which are greater than the sum of their parts through the interaction of the intervention with its context (Hawe, 2015; Hawe et al., 2009b). Moreover, with the majority of inquiry neglecting to investigate context in detail, it remains difficult to translate, disseminate, implement and sustain research evidence into real world practice (Brownson et al., 2014; Luke, Wald, Carothers, Bach & Harris, 2013).

Such tendency toward the dominance of more simplistic educational interventions within reviews may, in part, be due to the fact that Randomised Controlled Trials (RCTs) are viewed as gold standard, along with a common perception that RCTs are not always possible for whole system based interventions. Indeed, many systematic reviews are limited to the inclusion of such study designs. There are many examples of more ambitious whole system focused school interventions in the literature, but these have often been evaluated qualitatively or using designs other than RCTs. For example, Gugglberger et al. (2014) used qualitative data from interviews with Head Teachers to investigate the intervention side effects of health promotion practice for school health coordinators.

The hierarchy of evidence applied to judge the status of evidence was developed specifically to raise the quality of clinical interventions and to provide guidelines for practice. It is based on a hierarchy of research methods that holds the RCT as the

research design that provides the best interventional evidence. It has been argued that this hierarchy of evidence most suits medical research, as opposed to complex social problems which are liable to more variation (Petticrew & Roberts., 2003). While for many school-based interventions, RCTs remain the most suitable method for evaluating outcomes, interventions which aim to change whole national school systems, such as networks of healthy school schemes, are perhaps more difficult to evaluate in this way. For example, researchers have advocated for the inclusion of varied study designs and the integration of qualitative and theory-based research within systematic reviews (O'Mara-Eves & Thomas, 2016; Thomas, O'Mara-Eves & Brunton, 2014a). This approach is being led by realist reviewers to explain the role of human agents in creating demi-regularities (Pawson, Greenhalgh, Harvey & Walshe, 2005; Shepperd et al., 2009). Such systematic reviews may be useful for reviewing and collating evidence for a whole school approach, such as that underpinning the HPS approach. This will be discussed in further detail within the following section.

2.3 Evidence for the Health Promoting Schools Approach

The WHO HPS framework is based on the Ottawa Charter (World Health Organization, 1986). It advocates whole system change, through a settings approach, including curriculum, school environments and engagement with parents and communities. It emphasises both the need for synergistic approaches to health and education and a need for holistic approaches to health which influence multiple health outcomes simultaneously, rather than multiple single risk-factor interventions. It defines a HPS as 'one that constantly strengthens its capacity as a healthy setting for living, learning and working' (World Health Organization, 1998). A settings approach to health improvement in schools, aiming for a more comprehensive approach to school health, has been promoted around the world (Pearson et al., 2015). Further to this, the WHO created a Global School Health Initiative in 1995, aiming to work at the local, national, regional and global level to improve health and education activities (World Health Organization, 1998). In Europe, the Schools for Health in Europe (SHE) Network was established in 1992 and had 43 member countries by 2009. This network focuses on health-related policy development

within both the health and education sectors and the development of national schemes within member countries (Buijs, 2009).

In Wales, the national scheme is named The Welsh Network of Healthy School Schemes and was established in 1999 (Rothwell et al., 2010). It focuses on the following themes: food and fitness, mental and emotional health and wellbeing, personal development and relationships, substance misuse, environment, safety and hygiene. Schools achieve different phases within the scheme, starting with Phase 1-6 before being assessed for the National Quality Award. Healthy Schools Coordinators are responsible for supporting implementation of HPS approaches in schools, often working alongside one or more members of teaching staff in each school who have been allocated responsibility for health and wellbeing as an addition to their main teaching roles.

2.3.1 Theory underpinning the HPS approach

Traditional settings approaches to health focus on expanding school health promotion from education to intervening at multiple levels in one setting. For example, St Leger (1997) outlined that a health behaviour such as nutrition may be targeted through public policy, a supportive environment, education and community action. Moreover, in support of the HPS approach, Dooris (2006) advocates a settings approach as it encourages the investigation of interactions between individuals, environments and outcomes as well as acknowledging the wider impacts on health. Dooris (2006) states that a mixed methods approach may help to capture programme effectiveness and to investigate the related context and mechanisms. However, a settings approach is often conflated with the implementation of individual-focused health interventions within settings, such as schools.

The Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003), focuses on the need for general structural change in order to achieve health improvement, as opposed to making changes solely related to health. Specifically, this theory postulates that positive health outcomes may be elicited through manipulating pedagogic and management practices within schools (Markham & Aveyard, 2003). Individuals are thought to only be in a position to

choose positive health behaviours and outcomes when their capacities for practical reasoning (i.e. ability to critically perceive reality and view problems and solutions from different perspectives) and affiliation (i.e. possession of shared values and empathetic understanding of others' orientations to meaning) are supported.

Schools can enable students to realise these potentials through the instructional order (the means of developing knowledge and skills) and the regulatory order (the institutional norms, value and belief system). This is related to schools' ethos and values and can be achieved through reducing barriers between the school and the local community, between teachers and students, between students and between subjects, thus aligning the values between these groups. This can also be achieved through increasing student input into decision making and learning processes in schools (Markham & Aveyard, 2003). If the demands of both the instructional and regulatory orders are met by students, they are categorised as committed and, in turn, have the greatest chance of improved human functioning and health due to their interactions with the school environment.

This theory focuses also on the potential role of schools in the reproduction of health inequalities. As argued by Bernstein, for example, interactions with school are often likely to be more positive for middle class students, with schooling representing a more natural extension of their home environments (Bernstein, 1975). In contrast to this, students who reject or are unable to meet these orders, are said to be 'alienated and are less likely to experience good functioning and health outcomes (Markham & Aveyard, 2003). This is more likely to be the case for deprived students due to a likely incongruence between values in the home and school (Bernstein, 1975).

Several studies have employed the Theory of Health Promoting Schools and Human Functioning and school organisation (Markham & Aveyard, 2003; Moore et al., in press) to theorise how school effects may promote positive health outcomes. For example, Bonell et al. (2013) conducted a systematic review of the effects of school environment on student health, as reported in section 2.2.5, finding lower rates of substance use among schools with higher attainment and attendance. They also found that the value added in terms of educational outcomes and attendance are

viewed as proxies for school culture, whereby authoritative schools are more likely to have a higher level of control which students can relate to. In turn, this is likely to result in a higher level of student commitment and to lead to an increased likelihood of positive health outcomes. However, the routine data utilised in this study does not provide an insight into these theorised processes (Bonell et al., 2013). Thus, qualitative investigation is required to obtain an insight into the lived experiences of students and how this relates to the constructs of this theory.

2.3.2 Effectiveness of the HPS approach

Langford et al. (2014) conducted a recent Cochrane systematic review of 67 trials investigating the effectiveness of interventions based on the WHO HPS framework (i.e. combining curriculum development, environmental change and family engagement) on health and wellbeing among students. There was some evidence to suggest this approach can have a positive effect on some areas of health and wellbeing, including body mass index, physical activity, fruit and vegetable consumption, cigarette use, and bullying. In line with this, Stewart-Brown (2004) conducted a review of the effectiveness of HPS, concluding that interventions which are complex, multi-dimensional and embedded in more than one domain are likely to be most effective. Despite this, health education has dominated much early school health work (Waters et al., 2014). For example, the Dutch Healthy School and Drugs Project was a multi-component, classroom-based, teacher delivered health education intervention, with a school committee to coordinate drug prevention and changes to school rules on smoking, drinking and drug use (Cuijpers, Jonkers, De Weerdt & De Jong, 2002). The intervention had a significantly positive effect on health-related knowledge, but no effect on cannabis use. This lack of intervention effect on behaviour may reflect the large educational component and limited adaptability to context (Cuijpers et al., 2002).

A review of nutrition interventions based on the HPS approach showed a positive effect on supportive school environment and ethos, curriculum delivery, parental involvement and improved dietary behaviour. However, only one study demonstrated maintenance of this behaviour after two years, thus the authors recommend improved follow-up periods and longer interventions (Wang & Stewart,

2013). The authors conclude that using a HPS approach can be effective in improving knowledge and behaviour with regards to diet, but that more training is required to improve teachers' knowledge of nutrition education and future interventions should be designed according to a social ecological perspective (Wang & Stewart, 2013).

Social Ecological Models (SEM) place individuals in their broader social context and advocate the design of interventions to reflect this by intervening at multiple levels (Stokols, 1996). Despite these studies employing a HPS approach and intervening at multiple levels of the SEM, there is still a lack of understanding of the need to respond to variability between systems' pre-intervention positions, in terms of health-related problems and their causes (Teutsch, Gugglberger & Dür, 2015). There is an element of conducting the same intervention in each school without taking context into account and an accumulation of single risk factor interventions rather than whole school approaches (Hawe, 2015).

In acknowledgement of this issue, McIsaac et al. (2016) conducted a scoping review, identifying a range of interventions within different countries that have employed a broader systems level approach to support the uptake of a HPS approach. However, this review simply focused on the identification of higher level interventions, such as changes in policy and resources, and did not elaborate on their effectiveness for changing system functioning. Thus, it is arguable whether many studies included within the above reviews can truly be said to have evaluated interventions whose design and implementation was consistent with the HPS settings approach aiming for whole school system change. The following section will discuss the use of process evaluations, either alongside trials or as stand-alone studies, to understand the implementation and functioning of HPS approaches.

2.4 Implementation issues and school context

Negligible, modest or a lack of effects have historically been found as a result of many large scale trials (Thompson, Coronado, Snipes & Puschel, 2003) and many authors have described an 'implementation gap', whereby health interventions fail to be implemented into the reality of the school setting (Roberts-Gray, Gingiss &

Boerm, 2007; Rohrbach, Grana, Sussman & Valente, 2006). The previous section (2.3.2) identified such an implementation gap, whereby the evidence demonstrates that the theoretical structure of a HPS approach commonly differs from what is actually implemented in practice, i.e. a health education dominated approach focused on single topics, as opposed to a whole school approach. While adding health topics to the curriculum is straightforward, more complex interventions have proven challenging to implement (Langford et al., 2014). Indeed, the "minimally disruptive" nature of health education, in terms of impact on school systems, is perhaps why it has been favoured to date, though perhaps simultaneously why it has failed to disrupt entrenched patterns of health and inequality (Hawe et al., 2015a). There remains a substantial need therefore to better understand the challenges in achieving change within schools.

Despite this, researchers evaluating school-based interventions have often tended to neglect an understanding of the 'black box' of an intervention through process evaluation to unpick what has actually occurred within such trials, e.g. how have constituents of the intervention actually been implemented and how have they interacted with their context (Moore et al., 2015a; Pearson et al., 2001). Instead, in the minority of cases where trials are accompanied by process evaluations, these tend to employ quantitative methods to measure what has been delivered at a fairly superficial level, as opposed to focusing on the process of implementation and the role of context (Moore et al., 2015a). Moreover, process evaluation is often focused upon delivery of the new activities within the intervention schools, rather than understanding existing practices, and how these are displaced and substituted by new ways of working (Langford et al., 2015). This limits researchers' ability to evaluate the extent to which any given intervention has changed prior practices.

Examples of qualitative research focused upon implementation of a settings approach include Inchley et al. (2007) who identified ownership and empowerment, leadership and management, collaboration and integration of HPS within the school to be central to effectiveness of the HPS approach. A further example comes from a qualitative study of capacity building with 11 Head Teachers in HPS in Austria. Findings showed that schools perceived the need for structures and resources to be in

place both internally and externally in order for a HPS approach to be implemented successfully (Gugglberger & Dür, 2011). Internally, this included factors such as knowledge, senior management commitment, teamwork and resources, whilst externally there was a perceived need for financial resources, facilitating laws and policies and health promotion consultants. This highlights a need for capacity building at a local, regional and national level (Gugglberger & Dür, 2011), to change system functioning. This also suggests that more radical interventions employing settings approaches may have been implemented, but might have been omitted from systematic reviews due to being evaluated using qualitative research methods (Thomas et al., 2014a).

A process evaluation investigated the Comprehensive School Health approach in Canada and the role of leadership within its implementation. The Comprehensive School Health approach has been described as synonymous with the HPS approach (Veugelers & Schwartz, 2010). Findings showed Head Teachers to be central to shifting and maintaining change to school ethos by emphasising their commitment to the project and playing a dynamic role which is responsive to changing context (Roberts et al., 2015). Moreover, findings demonstrated a need for a distributed leadership structure and concluded that policy development is critical for facilitating implementation through providing Head Teachers with justification for change (Roberts et al., 2015; Samdal & Rowling, 2011). These findings were based on qualitative interviews with Head Teachers, thus the views of other school stakeholders are required. Despite this, findings do demonstrate the value of qualitative process evaluation in understanding the process of implementation. Overall, these studies demonstrate the difficulty of implementing an intervention within a school setting. Despite this, negligible effects of public health interventions have become accepted as the norm in this field, often resulting in high costs for the elicitation of very small benefits (Hawe et al., 2009b), with many trials focusing on outcomes and neglecting to measure implementation. This highlights the need for a fundamental shift in thinking in order to advance the field of public health.

A paucity of process evaluations has been demonstrated within trials of school-based health interventions. In their review, Langford et al. (2015) reviewed the quantity

and quality of process evaluations conducted as part of interventions within their systematic review on HPS approaches and obesity. Out of 57 included studies, 54 studies reported some sort of process data. However, 41 of these studies only used quantitative process data and not all explicitly stated that they would be undertaking a process evaluation. Findings showed that the quality and quantity of process evaluation was varied, with 52 out of these 54 studies only conducting quantitative investigation into fidelity and acceptability. Such assessments of fidelity and acceptability lack scope and depth and are insufficient to explain why certain interventions produce positive outcomes whilst others do not (Langford et al., 2015). This is particularly pertinent for systems-based interventions as there is a need to understand the nuances of how an intervention has been adapted across contexts, while maintaining consistency with the core intervention logic (Patton, Bond, Butler & Glover, 2003).

Out of those studies that did undertake process evaluations, it was found that lack of institutional support and competing priorities, such as a focus on literacy and numeracy, were the main barriers to implementation. Some process evaluations also discovered barriers at a higher level, such as within the local infrastructure, which were outside of schools' control (Langford et al., 2015). The review concluded that the creation of effective partnerships between researchers, schools and families is key to a successful HPS approach, although it was acknowledged that this was very difficult to achieve (Langford et al., 2015).

A realist review by Pearson et al. (2015) into the implementation of school-based health promotion interventions found that 31 out of 63 included studies reported process data. The review developed four programme theories; preparing for implementation, initial implementation, embedding into routine practice, adaptation and evolution. Within preparing for implementation, the importance of a distributed leadership structure was emphasised, whereby senior management support is provided, but certain coordination roles are delegated to other members of staff, such as responsibility for intervention delivery (Pearson et al., 2015). A review by Wang & Stewart (2013) focusing on nutrition interventions utilising the HPS Approach found that only six out of 19 studies incorporated a process evaluation, with only

three of these involving a qualitative element. These process evaluations showed great variation in parent and student participation levels between and within studies and schools. Thus, this demonstrates the need to investigate school effects and how interventions can be designed in order to adapt to different school systems. This is opposed to viewing school-based interventions as an 'add-on' within a school.

Further to this, a systematic review and theory synthesis (Bonell et al., 2013) showed that only four out of 37 studies conducted a process evaluation and only one included a qualitative element to examine how context might influence delivery or uptake. This discrepancy with Langford (2015), may be explained by the quality assessments of process evaluations undertaken by Bonell et al. (2013). These process evaluations focused upon measures of feasibility and acceptability and, although 24 out of 37 specified a theory, these were mainly individual-level theories (Bonell et al., 2013). A systematic review by Moore et al (2015b) focusing upon socioeconomic gradients in universal school-based interventions also found that only seven out of those 20 studies reporting effects on inequalities also reported process evaluation data.

Whilst, as reported in section 2.2.6, many systematic reviews use inclusion criteria that screen out studies which do not comply with an RCT design (O'Mara-Eves & Thomas, 2016), a systematic review was conducted by Hung et al. (2014) whose inclusion criteria did not place any limits on study design. This review synthesised qualitative process evaluation data from six included studies focusing on factors which facilitate the implementation of a HPS approach. They identified five enabling factors: 1) following a framework or guidelines; 2) support from staff, management, government, health agencies and other stakeholders; 3) a multidisciplinary and collaborative approach; 4) professional networks and relationships; and 5) training and education. Tailoring of intervention components to local contexts was also identified as important, which is consistent with systems thinking and demonstrates the higher level of detail regarding the process of implementation that may be obtained through alternative research methods. Despite qualitative process evaluation data obtaining a higher level of detail on the process of implementation,

these studies often do not assess effectiveness, thus suffering the opposite limitation to many trials.

To summarise, although limited in terms of quantity and quality, process evaluations that have been conducted alongside trials identified essential elements of interventions, which were aligned with systems theory (Carey & Crammond, 2015). These included tailoring to individual school systems, aligning interventions to the core aims of the school, co-production to increase ownership, providing ongoing training, support and communication. Despite this, within these reviews many included interventions either did not specify a framework or theory or reported the basis of their intervention as an individual-level theory (Bonell et al., 2013; Langford et al., 2014). The importance of producing research that moves beyond tightly controlled randomised trials to research that better reflects real world settings, such as process evaluation, has been argued by Green (2006). He advocates systems thinking as a way of including multiple levels in understanding reciprocal relationships within a phenomenon and achieving a more in depth understanding of the practice context through methodology. This has been achieved conceptually through the use of Social Ecological Models (SEM) (Green, 2006) as a framework for ensuring multiple levels of influence (e.g. individual, interpersonal, organisational, community, policy) are addressed within school-based interventions. However, the operationalisation of SEMs often equate to simply describing 'ecological' interventions as those which implement activities at more than one level of influence. This highlights a need for interventions to conceive the dynamic interactions within and between activity and context at different levels of the system (Hawe et al., 2009b).

2.4.1 Implementation frameworks

The overview of evidence provided in this section demonstrates a general tendency for investigation of the process of implementation and the role of context to be neglected in health improvement intervention research (or for such research to be conducted in isolation from a focus on effectiveness). This is despite the fact that qualitative investigation demonstrates the difficulty of implementing interventions in schools. Both the studies and the reviews that summarise them often do not provide

adequate information on prior system practices, implementation, and each intervention's interaction with the school system. Thus, it is difficult to determine whether interventions have in fact achieved intended system changes.

The above evidence also demonstrates the need for infrastructure to facilitate system change, whereby higher level theory-based interventions can be implemented within a large number of schools to affect change. In order to effectively account for contextual variance between systems, it is important that process evaluation to assess implementation incorporates a qualitative element to investigate differing responses within different settings (Aarons, Fettes, Sommerfeld & Palinkas, 2012). Hawe (2009a) argues that intervention effectiveness findings are always contextually situated. Thus, there is a need to incorporate the role of context into such research to deal with this level of uncertainty and variance across different systems.

Despite this, there have been examples of research which has focused on the development of implementation frameworks to overcome these issues. For example, Samdal & Rowling (2011) identified and described eight theory-driven implementation components of HPS. These included preparing and planning for school development; policy and institutional anchoring; professional development and learning; leadership and management practices; relational and organisational support context; student participation; partnerships and networking; and sustainability. This description solely described each component in isolation, rather than the complex interplay between them. This sustains the issues outlined above through promoting implementation that does not engage with the system, thus neglecting the role of context.

On the other hand, Pearson et al. (2015) conducted a realist review to develop programme theory to describe the conditions, actions and mechanisms which lead to effective implementation of school health promotion programmes, accounting for the role of context. They identified four stages of programme theory; preparing for implementation, introducing a programme within a school, embedding a programme into routine practice and fidelity of implementation and programme adaptation. Although not explicitly discussed within the paper, these findings demonstrate a

good alignment with systems theory (Carey & Crammond, 2015). For example, the review highlights the need for pre-delivery consultation with each school and the need for variance in intensity of this consultation is discussed in terms of the topic area and school history of delivery (Pearson et al., 2015). This therefore represents evolution from the limited view of implementation measured as the extent to which individual intervention components are implemented with fidelity, beginning to incorporate a focus on prior system functioning (Villeval et al., 2016). It also builds on Samdal & Rowling's (2011) framework by addressing the interaction of a programme with the system and context in which it is implemented, rather than the implementation fidelity of individual components.

2.5 Theoretical frameworks relating to structure and agency

Despite the breadth and depth of research and reviews published that focus on school-based health interventions, the reductionist approach of intervention design, implementation and evaluation has limited the progression of knowledge within this field. Intervention components are often viewed as 'add-ons' whereby they are designed in isolation from context and therefore conducted on a school, not integrated into the school system. Interventions are often under-theorised and researchers regularly neglect to theorise how interventions will engage with and adapt to differing systems (Hawe, 2015; Moore et al., 2015a). This has perhaps, to some extent, been perpetuated by a tendency for researchers to select off-the-shelf theories, which often focus only on individual level processes, even where the aim is to achieve change at organisational levels. In a recent review of effects of school-based interventions on health inequalities for example, the minority of studies which cited a theoretical framework almost exclusively drew on theories from health psychology (Moore et al., 2015b).

While much attention is often paid to intervention "theories of change", in terms of how actions are anticipated to impact student health, if implemented as intended (Moore et al., 2015a), there is typically little attention to system level theories of change in school health research (Moore et al., 2015b). Thus, interventions utilising such theoretical standpoints in their design, are unlikely to have a significant effect on school system functioning as the process of achieving system change is under-

theorised and, subsequently, student outcomes. In fact, alongside inadequate methods and involvement of communities, impotent theory has been identified as a potential reason for the current problem of elicitation of negligible or no effects within public health interventions (Zaza, Briss & Harris, 2005). This demonstrates the need for research targeting school health improvement to focus on system-level change.

Models such as the Theory of Planned behaviour (TPB) (Ajzen, 1985) have been widely used in school health interventions, despite their individualistic focus. This has been reinforced by the MRC guidance for developing and evaluating complex interventions, which advises that a behavioural scientist should be involved in implementation studies (Craig et al., 2008). Glanz and Bishop (2010) reviewed the role of behaviour change theories in both the development and implementation of public health interventions finding that the TPB, the Social Cognitive Theory, the Transtheoretical Model, the Health Belief Model and the PRECEDE/PROCEED model were the most frequently employed theories, highlighting the neglect of system-level constraints within intervention design (Grimshaw et al., 2014). This suggests a need to identify theories that address structure and agency issues and their potential utility in understanding school contexts and implementation processes.

2.5.1 Structure and agency-based theory

Social network theories

Social networks among humans are one way of measuring both structure and agency, and are characterised by cliques of similar individuals (Newman & Park, 2003). While the formation of cliques may be problematic when these represent clusters of insular, homogenous groups with limited communication between them, cliques can serve a functional purpose where sufficient brokerage exists between them, for example when they are connected through weak ties (Granovetter, 1973). Brokers are defined as actors who inhabit a bridging position within a network which allows them to send and receive information or other resources between otherwise disconnected parts of the network (Burt, 1992).

Structural Hole theory describes alters, or the individual members nominated as part of a network (Burt, 1984), playing a brokerage role to fill structural holes between cliques, where distinct information is held (Burt, 1992). Individuals in brokerage roles may be more likely to have their ideas listened to and actioned (Burt, 2004a). Burt (2004a) posits that brokerage can facilitate the development of social capital and good ideas through allowing individuals in brokerage positions to experience alternative views and behaviour.

Whilst the above social network theories provide insight into relational contexts between actors, they do not tend to provide a full insight into the structures and contexts within which these interactions occur. One example of the use of social network analysis in health research comes from Provan and Millward (1995) who used a cross-sectional design to compare the effectiveness, density and centrality of inter-organisational systems of mental health primary care in the US. A mixture of quantitative and qualitative methods demonstrated that system effectiveness varied according to network structure and context (Provan & Milward, 1995). Furthermore, this may help to theorise the interactive relationship between structure and agency, which will be elaborated upon within the next section.

Diffusion of Innovations

Diffusion can be defined as the process by which an innovation or new idea spreads via certain communication channels over time and among members of a social system (Rogers, 1995). The theory can be used to help explain arrival at the consequences of the adoption of an intervention (Rogers, 1995). Change agents can also be influential in the diffusion process by securing the adoption of a new idea or trying to slow the process of diffusion and prevent adoption of innovations with undesirable effects. However, investigations of Diffusion of Innovations (DOI) often rely on recall and do not address the effect on socioeconomic inequalities within a social system (Greenhalgh, Robert, Macfarlane, Bate & Kyriakidou, 2004; Haider & Kreps, 2004). Moreover, DOI Theory has been criticised for oversimplifying a complex reality, emphasising individual choice of agents over and above system-level determinants (Greenhalgh et al., 2004). Therefore, there would be a need to utilise other theories in combination in order to understand the role of context in system level change.

Normalisation Process Theory

Normalisation process Theory (NPT) has been used as a framework to facilitate the successful implementation and integration of an intervention into a setting (McEvoy et al., 2014). In effect, NPT posits that an intervention becomes normalised within that setting through a social process of collective action (May, 2013a; May & Finch, 2009). The four main components of NPT, which have interactive relationships with each other and the intervention context, are coherence (sense-making), cognitive participation (engagement), collective action (work to enable the intervention to happen) and reflexive monitoring (formal and informal appraisal of costs and benefits of intervention). An example of NPT's use in implementation research comes from a qualitative study focusing on the implementation of e-health initiatives in healthcare (Murray et al., 2011). The authors found this theory to be useful for studying implementation and findings showed that perceptions of implementers, such as their views on the initiative's impact on professional-patient interactions and its fit with organisational goals, were associated with normalisation (Murray et al., 2011).

This theory takes into account the wider system to a greater extent than DOI Theory, through collective action and reflexive monitoring and the acknowledgement of interactive relationships between the four main components and context. However, it still focuses upon the implementation of individual intervention components, rather than how the intervention functions as a whole and interacts with context to create emergent outcomes. The next section will elaborate further on theories that, to varying degrees, take system structure into account.

Implementation Theory

Although Implementation Theory (IT) is relatively new and has not been employed within published studies of implementation, it has been theorised by May (2013b) who combined NPT with other relevant constructs from psychological and sociological theories to outline the processes of implementation. These processes are social mechanisms developed through emergent expressions of agency and dynamic elements of context, which are contextualised within social systems (May, 2013b). Processes of implementation are understood through the interactions between

agency, components of interventions and contextual factors. The four constructs of the IT include capability, capacity, potential and contribution (see Figure 1). Capability of agents to implement and embed processes depends on the workability and integration of an intervention within a social system. Capacity relates to the social and structural resources within a system and includes social norms, social roles, material resources and cognitive resources of agents. If contributions carry forward in time and space and are sustained, they could potentially be normalised into every day practice (May, 2013b).

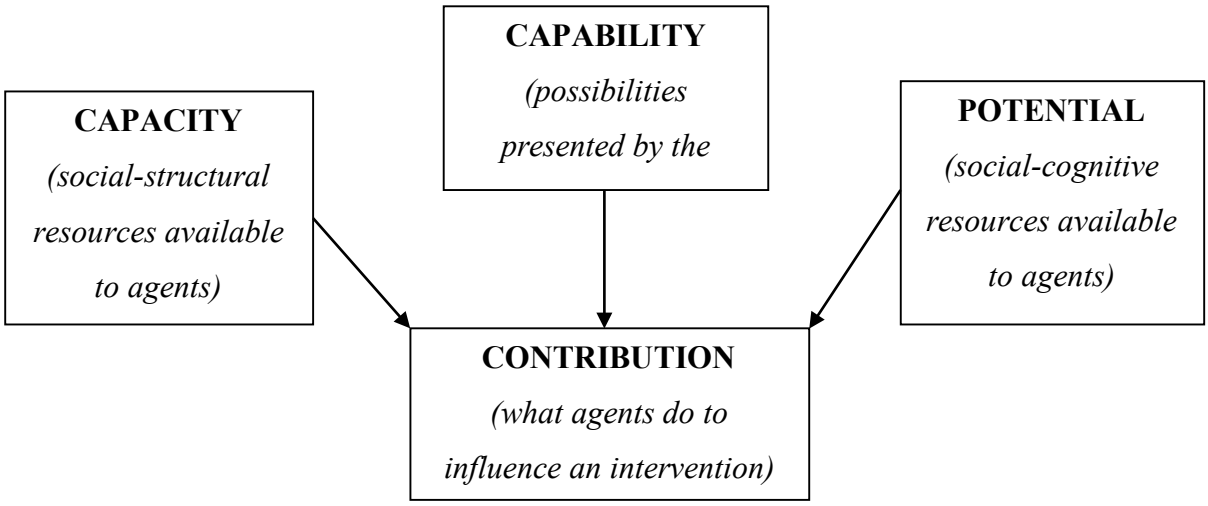


Figure 1 Resources and possibilities for agents' contributions to implementation processes

Despite having built upon DOI and NPT and creating a positive move towards acknowledging the role of both system structure and agency in interventions, IT still focuses upon the individualistic and simplistic language of intervention components (May, 2013b). Moreover, due to the relative youth of this theory, there are very few concrete examples of its operationalisation within studies of implementation. One study focusing on the implementation of a coordinated healthy lifestyle intervention in primary care employed IT (May, 2013a). They found this theory to be a useful tool for comprehensively studying and identifying barriers and facilitators to implementation. They also discovered that in practice the constructs of capacity, capability and potentional led to contribution, as outlined within the theoretical

framework. Moreover, implementation was shown to vary across contexts due to differences in preconditions (Thomas, Bendtsen & Krevers, 2014b).

2.5.2 Theory and the duality of structure and agency

Structuration Theory

Whilst social network analysis holds an account of human agency which is limited to self-interest (Burt, 2000; Granovetter, 1973), Structuration Theory moves one step further towards systems thinking through proposing a complex and reciprocal relationship between structure and agency in partnerships (Giddens, 1984). Agency can be defined as an individuals' capacity to express free will and to act independently, whilst structure can be defined as patterns within society, such as social networks or socioeconomic stratifications, which limit or facilitate individuals' capacity for free will (Giddens, 1984).

Structuration Theory takes the understanding of networks to the next level by proposing the duality of structure and the recursiveness of social praxis. The duality of structure suggests that structure and agency should never be studied in isolation due to their interdependency, as one cannot be fully understood without the other (Giddens, 1984). It proposes that individual actors have active agency which can reproduce or change social structure (Greenhalgh & Stones, 2010). Within Structuration Theory, structure is not simply defined as the pattern of ties between actors. It represents the context of social agency as an outcome and mediator, not as a detached phenomenon (Giddens, 1984). Moreover, agents are considered to be socially embedded whereby a flow of interactions are path and context dependent and embedded into social practices (Sydow & Windeler, 1998). The difficulty of employing these abstract concepts outlined by Giddens (1984) has been widely acknowledged (Greenhalgh & Stones, 2010).

Strong Structuration Theory

Strong Structuration Theory has been developed to bridge the gap between the philosophical level, or ontology-in-general, and substantive level, or ontology-in-situ, of structuration. Although Giddens' Structuration Theory (1984) has been hailed for providing a competent explanation of ontology-in-general at an abstract

level, it has been criticised for being far removed from the reality of specific actions that take place at a specific time and space and, indeed, not even engaging with or acknowledging the importance of applying the theory to real situations. The addition of detail regarding how to analyse the duality of structure provides a potentially effective solution to the limited practical applicability, which Structuration has been criticised for (Greenhalgh & Stones, 2010).

As it is relatively new, Strong Structuration Theory (Greenhalgh & Stones, 2010) has only been employed in one published study of health and wellbeing. This was a study which aimed to understand the interaction between population and individual-level obesity risk factors in pre-school children (Chan, Deave & Greenhalgh, 2010). Despite this, several published studies have theorised its potential use in understanding implementation within different disciplines, such as health care governance (Bodolica, Spraggon & Tofan, 2015) information technology and technology adoption (Greenhalgh & Stones, 2010; Neves, Franz, Munteanu, Baecker & Ngo, 2015) and management (Lee et al., 2007). This suggests that Strong Structuration Theory would lend itself to understanding a school setting in relation to health and wellbeing.

Strong Structuration theorises structuration in a quadripartite cycle to elaborate on the duality of structure (Greenhalgh & Stones, 2010). Strong Structuration Theory outlines four components of the duality of structure that can be analysed separately (see Figure 2). These are external structures, internal structures within the agent, active agency and outcomes. For clarity within this thesis, the component 'external structures will be split into two: 'external structures' will describe structures external to the school, whilst 'internal structures' will describe structures which are within school grounds, but external to individuals. Following on from this, the component 'internal structures' will be renamed 'intrinsic factors' to describe agents' knowledge and dispositions. This change in terminology promotes clarity and aims to allow differentiation between structures. This is visually represented in Figure 2.

The first of these components is **'intrinsic factors'**, which include general dispositions, such as attitudes and moral principles, and conjuncturally-specific

knowledge, such as how individuals are supposed to act within the external and internal structures. Giddens purports that conjuncturally-specific knowledge is made up of the following three structures. Structures of signification, or interpretive schemas refer to the conjunctural knowledge of the hermeneutic schemas of other agents within the context, or how others would interpret actions (Giddens, 1984). Structures of domination refer to the level of knowledge regarding agents' own power capacities in relation to who they rely on for resources and who can command power over them within the context. Finally, structures of legitimation refer to the level of conjunctural knowledge regarding agents' normative beliefs and the pressure upon them within the immanent interaction and, therefore, how agents are likely to behave.

The second of these components is **'internal and external structures'**, which are conceived as the structural context of action, both internal and external to the school, and exist autonomously from the structures that exist within an individual. These are mediated by networks of social relations which connect social positions associated with identity and practice (position-practices). These networks are, in turn, changed or reproduced by active agents. The third component, **'active agency'**, focuses specifically on how agents combine factors, such as context, time and space constraints, knowledge of what actions are expected from them and knowledge of likely rewards or negative outcomes, when deciding how to act within the external structures. The fourth component, **'outcomes'** can be defined as change, elaboration, reproduction or preservation of external and internal structures as well as events. These occur as a result of the interplay of internal and external structures, which produce action via active agency. This action will then produce intended and/or unintended consequences depending largely on the active agent's level of accuracy and depth of knowledge of the context prior to taking action (Greenhalgh & Stones, 2010).

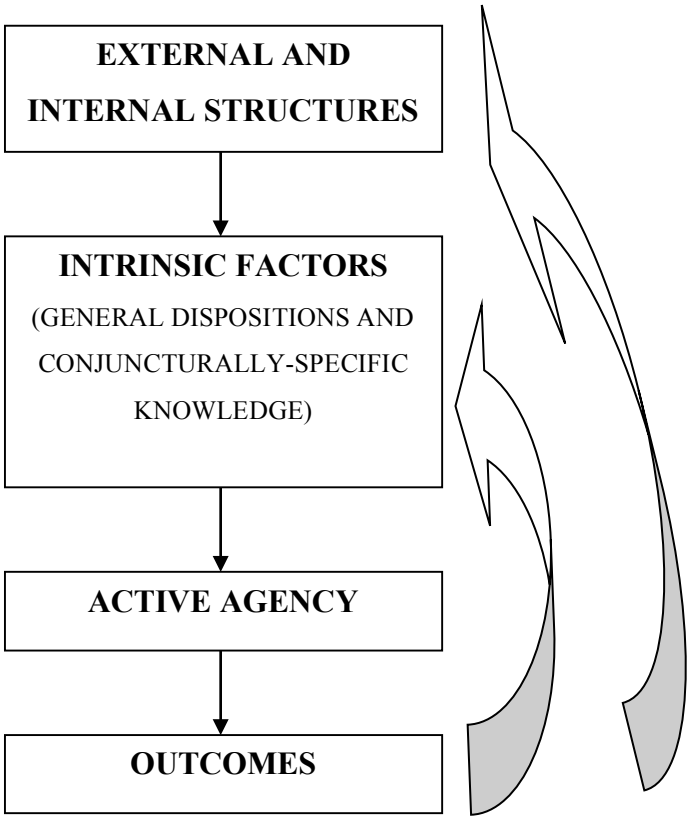


Figure 2 Four components of Strong Structuration Theory

Giddens has been criticised for underplaying the role of others in producing action and over-individualising the process through his focus on intrinsic factors and overlooking the role of external social pressures. For example, Thrift (1996) emphasises the need to consider an agent's actions in relation to a network of position-practices and their relations. The agents within this network can affect outcomes, even though they may not be directly involved in an immanent interaction. Within Strong Structuration, Stones has aimed to retain the concept of the knowledgeable and active agent whilst theorising the extent to which their actions are constrained by external forces (Greenhalgh & Stones, 2010).

2.6 Conclusion

While the school health literature remains limited and US-centric, there is growing evidence that changing school environments, or intervening at multiple levels (Langford et al., 2014), can influence health (Bonell et al., 2013). Moreover, schools have been shown to exert effects on health independent from the characteristics of their intake. It is important for further research to establish whether a synergistic relationship exists between health and education as evidence of such a link may facilitate the prioritisation of health within school settings.

The WHO HPS framework advocates whole system change, including curriculum, school environments and engagement with parents and communities, emphasising a need for holistic approaches to health which influence multiple health outcomes simultaneously, rather than multiple single risk-factor interventions. However, while delivery of educational curricula, around single health topics, can be achieved relatively easily, attempts at higher level system changes have often been less successful (Langford et al., 2015), with a tendency for interventions to focus on the implementation of individual components in isolation from their context (Hawe et al., 2009b). This method of intervention design assumes that system level change can be achieved through the aggregation of individual level effects. However, this ignores the dynamic nature of the production of intervention effects, which are greater than the sum of their parts, through the interaction of the intervention with its context (Hawe et al., 2009b). This failure to understand system change has negative implications for the implementation of interventions. Thus, this limits the practical applicability and subsequent transference of such research into practice as evaluation results are unlikely to represent a true reflection of the intended intervention.

There has been limited progress in the field of school health, in part due to the reductionist nature of intervention design and the theoretical frameworks informing this. This chapter identified potentially relevant theoretical frameworks and discussed the extent to which they have been employed within school health research and their alignment with systems thinking. This demonstrated that the more reductionist theoretical frameworks had been employed with a higher frequency, often eliciting negligible effects. Strong Structuration Theory was identified as

having potential application for studying health and wellbeing in a school setting due to addressing the complex and reciprocal relationship between structure and agency in a practical manner (Hawe et al., 2009b; Stones, 2005). Specifically, Strong Structuration could be used to theorise how structures within and outside of the school interact with factors intrinsic to individuals and their active agency, leading to variance in school system functioning.

These findings highlight the need for a fundamental change in thinking to advance the field of public health. There is a need to understand system functioning prior to intervening so that interventions may be designed and implemented in a way which allows an intervention to work with a system and adapt to context, but without compromising intervention logic. A potential method of achieving this could be through combining Strong Structuration Theory with the conceptualisation of schools as CASs (Stones, 2005). Although CAS thinking is not yet fully developed, Chapter 3 will discuss its many applications and interpretations in relation to school health.

3 Features of complex adaptive systems and their application to the school setting

3.1 Introduction

Chapter 2 outlined the growing evidence that schools can influence young people's health. However, it was acknowledged that there are fundamental problems with this evidence which limits our ability to understand how interventions interact with school systems and produce change. In particular, attempts to achieve whole system changes in schools are often not fully realised, due to an underestimation of implementation challenges (Langford et al., 2015; Langford et al., 2014), and limited consideration of substantial variation in school starting points. This highlights the need to understand system functioning prior to intervening so that interventions may be designed and implemented in a way which considers variability in pre-existing contexts. Negligible effects of public health interventions have become accepted as the norm in this field, resulting in high costs for the elicitation of very small benefits (Goodman, 2000; Hawe et al., 2009b). This highlights the need for a fundamental change in thinking in order to advance the field of school health.

Combining Strong Structuration Theory with CAS thinking was identified as having potential application for studying health and wellbeing in a school setting, addressing the complex and reciprocal relationship between structure and agency in a practical manner, and enabling a deeper understanding of the systems into which any new intervention hopes to become embedded (Hawe et al., 2009b; Stones, 2005). However, CAS thinking is not yet fully developed, with many different applications and interpretations, while its application within school health is limited (Brainard & Hunter, 2016). As such, there is a need for its central tenets and associated methodologies to be fully clarified and for its potential application to school health to be developed further (Hawe et al., 2009b; Morrison, 2010). The conceptualisation of schools as CASs could provide a framework for understanding how schools engage differentially with external efforts to support change, and producing interventions which are synergistic with pre-intervention contexts and thus have an increased likelihood of achieving system change (Hawe et al., 2009a;

Zhang et al., 2014). This chapter will review the literature on CAS thinking and apply it to a school setting, while highlighting areas of theoretical tension. This will aim to provide further context and justification for the research questions, methods and theoretical frameworks employed within this thesis.

3.2 Complex Adaptive Systems thinking

School health research has moved somewhat towards an increased emphasis on intervening at a whole school level, based on the HPS approach described in Chapter 2 (Langford et al., 2014; World Health Organization, 1986). Dooris (2006) proposed a conceptual framework for settings approaches, such as that represented by the HPS framework, which included a focus on the SEM (McLeroy, Bibeau, Steckler & Glanz, 1988; Stokols, 1996), viewing settings as CASs and using a whole system focus to embed health within a setting. Systems thinking can be defined as viewing, in a conceptual manner, the interrelationships between parts or components and their relationships with the system as a whole (Trochim, Cabrera, Milstein, Gallagher & Leischow, 2006). A CAS is a dynamic network of many diverse agents and characteristics, constantly acting and reacting to other agents' behaviour, generating emergent system characteristics, which in turn exert influence on individual behaviour (Keshavarz et al., 2010). System characteristics and agents respond to stimuli in an inconsistent manner as they are highly context dependent (Keshavarz et al., 2010). Control tends to be highly dispersed and decentralised, and coherent behaviour arises from competition and cooperation among agents. The overall behaviour of a system is constantly adapting as a result of decisions made every moment by many individual agents (Regine & Lewin, 2014; Waldrop & Gleick, 1992).

Hawe et al. (2009a) identified that references to CAS thinking in the health literature had increased by 167% in 10 years. Despite this, CAS thinking is still often described inadequately and applied in a tokenistic or inappropriate manner (Brainard & Hunter, 2016; Datta & Petticrew, 2013). CAS thinking is better described as a conceptual framework, rather than a complete theory due to the current ambiguity surrounding the definition of CASs (Keshavarz et al., 2010). Also, since it is still an emerging concept, a challenge facing researchers is to realise its potential and its

implications for research methods and design (Brainard & Hunter, 2016; Haggis, 2010). Haggis (2010) argues that the use of CAS thinking is not just difficult due to limited definition and development of CAS thinking as a theory, but due to the fact that CAS thinking recognises that such systems involve uncertainty and are characterised by unpredictability. Indeed, Haggis (2010) acknowledges that some aspects of systems will never be understood due to their complexity. Complexity theories, which underpin systems perspectives, are emerging as a conceptual framework in health promotion (Keshavarz et al., 2010; Kremser, 2011) and have also been applied to healthcare and education (Osberg & Biesta, 2010; Plsek & Greenhalgh, 2001). In the education literature, CAS has been recommended for use in studying leadership and management in schools (Morrison, 2010) and for educational change to theorise and harness emergent behaviours (Mason, 2008).

Through a complex systems lens, intervention is defined as a potentially critical event in a system or something significant that happens within a system to trigger an evolution of new structures, new and emerging networks, new and changing relationships and redistribution of resources (Hawe et al., 2009b). Although much work has been undertaken to theorise schools as CASs (Hawe & Ghali, 2008; Hawe et al., 2009b; Keshavarz et al., 2010), there remains work to be done to operationalise this thinking within intervention research (Brainard & Hunter, 2016). Many school-based evaluations and intervention development frameworks have focused on describing the individual components of interventions, rather than studying the interactions of these components with contextual factors, such as initial conditions, history and time into account (Hawe et al., 2009a; Hawe et al., 2009b). This may be due, in part, to the comparative ease of conceptualisation of individual components and pressures to generate a scalable intervention which can be delivered successfully in different settings.

Examples of frameworks focused predominantly on defining intervention components include the Theoretical Domains Framework (Cane, O'Connor & Michie, 2012), a taxonomy of behaviour change techniques (Michie et al., 2011), Intervention Mapping (Bartholomew, Parcel & Kok, 1998) and Six Steps in Quality Intervention Development (6SQUID) (Wight, Wimbush, Jepson & Doi, 2015).

Furthermore, whilst it does advocate an iterative as opposed to linear process and acknowledges the role of context, even the MRC guidance for the development and evaluation of complex interventions does not focus on understanding the system prior to or during the development of an intervention (Anderson, 2008). A systems perspective, in defining an intervention explicitly as an attempt to change the system, draws our attention to the need to research and understand the system context and the dynamic processes within it before designing and implementing interventions (Hawe et al., 2009b).

In large part, the challenges described in Chapter 2 in relation to the partial and inconsistent implementation of interventions perhaps reflect a naivety to the complexity of school systems, and a tendency to privilege the study of "complex interventions" over "complex contexts" (Shiell, Hawe & Gold, 2008). Interventions are perhaps better conceived as events within complex systems, which produce outcomes in synergy with pre-existing contexts, and which may take root or wash out without leaving a footprint, depending on how well current system dynamics are harnessed (Hawe, 2015; Hawe et al., 2009b). The concept of CASs can be used to increase understanding of how such interventions interact with the organisational system, how they function and how they are adopted and implemented (Keshavarz et al., 2010).

Table 1. below outlines the characteristics of CASs as they apply to schools, proposed by Keshavarz et al. (2010). Schools possess many characteristics of CAS; they comprise diverse and ever changing agents, are nested within supra-systems such as Local Education Authorities, and comprise numerous subsystems (Keshavarz et al., 2010). Schools have rules and ethos and well developed mechanisms for prioritising information related to 'core business', while internal and external monitoring structures provide feedback loops and inform subsequent practice. They also have the freedom to act within a limited set of possibilities. Co-evolution is continual, whilst external intervention is likely to result in non-linear and unpredictable outcomes. System functioning emerges as a product of the interplay of the characteristics described above (Keshavarz et al., 2010). The way in which these characteristics can be utilised in the design, implementation and

evaluation of complex interventions will be discussed throughout this chapter. First, the next section will discuss relevant theoretical frameworks and how they will be layered within a CAS framework, after which there will be a section elaborating upon each characteristic of a CAS, outlined in Table 1.

Table 1 An outline of complex adaptive systems characteristics applied to the school setting (Keshavarz et al., 2010)

CAS characteristic	Definition
Diversity and dynamic nature of agents	Teachers, principals, admin staff, students, parents, families. Changes internally or externally introduced, and happening almost continuously.
Information flow	Well organised mechanisms to support flow of information and prioritise information of relevance to 'core' business agendas.
Nested system structure	Sub-systems – classes, year groups, disciplines. Part of supra-systems – local education board, department of education.
Dependent but autonomous	Freedom to act within fixed set of possibilities, determined by school 'culture', formal policies, local needs, resources and time.
Interactions within and between systems	Diverse interactions within and between schools, and with families / communities.
Rules	Formal rules and management structures, as well as more informal perceived and internalised 'rules' related to school ethos, norms and practice.
Feedback loops	Internal and external monitoring structures in relation to educational performance, which inform subsequent practices.
Non-linearity and unpredictability	Provision of external interventions may not produce intended changes, and may produce unintended consequences.
Change and co-evolution	Change in education sector policies, community, agents (teachers, students).
Emergence	School functioning as emergent products of the interplay of factors above.

3.3 Layering theory within a Complex Adaptive Systems framework

Whilst CAS thinking provides an overarching philosophical framework, as described, it is not a complete explanatory theory. Therefore, as well as employing CAS thinking as a conceptual framework, this thesis will embed different levels of theoretical frameworks to facilitate understanding of system functioning within schools (Patton et al., 2003). Westhorp (2012) outlined the process of 'layering' theory consistent with CAS thinking to yield a comprehensive theoretical overview of complex systems, highlighting a need to 1) combine theories in order to obtain coverage of different levels of the Social Ecological Model, and 2) view these theories through a complex systems lens to understand system functioning.

After careful consideration of the theories outlined in Chapter 2, it was concluded that Strong Structuration Theory (Greenhalgh & Stones, 2010) will act as the overarching higher level theory on which this thesis is based, whilst several lower level theories will be utilised to explain specific aspects of complex adaptive school systems. Markham and Aveyard's (2003) Theory of Health Promoting Schools based on human functioning, and Structural Hole Theory (Burt, 2004b) will also be drawn upon to provide a comprehensive framework for this thesis. Table 2 provides an overview of how these theories can be 'layered' to provide a comprehensive framework and how these are consistent with CAS thinking. Layering allows a conceptual framework to be developed to examine how system functioning is developed through mechanisms within different levels of the system (Westhorp, 2012).

Table 2 Consistency of theoretical frameworks with Complex Adaptive Systems thinking

Theory	Consistency with CAS thinking	Application to school health
Strong Structuration Theory (Greenhalgh & Stones, 2010)	Insight into the dynamic nature of agents Insight into a nested system structure Insight into rules, formal management structures and informal structures Insight into possible explanations for non-linearity, unpredictability and emergence in response to intervention Insight into feedback loops	A practically applicable framewor whereby active agency is facilitate or hindered by a mixture of intrins factors and internal and external structures This affects outcomes in terms of school system orientation towards health and wellbeing
Theory of Health Promoting Schools & Human Functioning, School Organisation and Pedagogic Practice (Markham & Aveyard, 2003)	Insight into boundaries between systems and sub-systems, such as students and teachers Insight into information flow between systems and sub-systems Insight into alignment of values between sub-systems	Breaking down barriers between students and teachers and peers increases student connectedness a capacities for affiliation and practical reasoning This in turn, improves health 'decisions' among students
Structural Hole Theory (Burt, 2004b)	Brokerage can facilitate understanding of school system dynamics alongside other theoretical frameworks, such as Strong Structuration Insight into information flow Insight into formal management structures and informal structures Insight into interactions between systems Insight into possible explanations for non-linearity, unpredictability and emergence	Network structures of staff facilita communication and the flow of resources, such as information abo wellbeing throughout a school system

Structuration Theory fits well with a complex systems perspective as it does not assume system evolution to be a linear process (Sydow & Windeler, 1998). It involves studying how systems evolve and are recursively produced and reproduced through interaction (Giddens, 1984). Therefore, Strong Structuration Theory fits well with the evaluation of complex systems, adding another dimension to implementation theories through the acknowledgement of, and practically applicable theorisation of, the duality of structure and agency (Stones, 2005).

Haines (1988) posits that Structuration Theory is well aligned with social network analysis, which has also been used within a CAS framework (Hawe & Ghali, 2008). She conceptualises both Structuration Theory and social network analysis as centred on individualism, whilst social network analysis is more focused upon the agency-system relationship. An emphasis on Structural Hole Theory could provide a deeper insight into aspects such as how informal structures facilitate or hinder information flow and communication between systems (Burt, 2004b; Haines, 1988). Moreover, Structuration Theory could be improved by the integration of the system component of social network analysis (Haines, 1988). The addition of an overarching complex systems perspective could allow analysis of the way in which health improvement functions within an open system, whilst drawing upon the strengths of Structural Hole Theory and Strong Structuration Theory as lower level theories.

In 1984, Giddens outlined Structuration Theory's applicability to system functioning, in that it is produced and reproduced by knowledgeable actors who draw upon structures, such as rules and resources (Giddens, 1984). CAS thinking and Strong Structuration Theory both emphasise connectivity and the duality of agency and structure and agency and systems and the importance of circular causality and feedback in society. However, Morrison (2005) argued that CAS thinking offers a more complete theory of change due to its focus on social production, as opposed to the reproduction and maintenance of status quo. This promotes system survival through inexorable development and change.

Whilst Structuration Theory can account for change as well as the maintenance of status quo, the main difference between the two theories is that, in Structuration Theory, agents are able to make the decision to remain the same. This level of stability is inconsistent with CAS thinking. Moreover, although Strong Structuration accounts for both agency and structure and the reciprocal relationship between them, the focus remains upon how this impacts individual level outcomes. This is as opposed to how this impacts upon system functioning and, subsequently, affects student level outcomes. This, therefore, highlights the need for the addition of a complex systems perspective. Several system characteristics are more fully explained by CAS thinking as opposed to Structuration. For example, emergence is better explained by CAS thinking due to the insinuation of internal change due to the open system's sensitivity to the external environment. On the other hand, the role of power is underplayed and tacit within CAS thinking, as opposed to Structuration (Morrison, 2005). Thus, for this aspect, CAS thinking could learn from Structuration.

The Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003) does not extend to theorising the effect of agency or how a relationship between structure and agency may affect student-level outcomes, or the question of how system change can be achieved. Despite this individual focus, the erosion of barriers and information flow between teachers and students and between peers, to increase school connectedness is consistent with CAS thinking in terms of its focus upon communication within and between sub-systems. This is also true of the alignment of core values between school and families through communication between these sub-systems (Keshavarz et al., 2010). The application of the approach of layering theory will be discussed throughout this chapter.

3.4 Key tenets of complex adaptive systems thinking and their relevance to school health improvement

This section will provide a detailed overview of the key characteristics of complex systems introduced in section 3.2 and outlined in Table 1 (Keshavarz et al., 2010). It will outline the potential value of understanding school systems from a CAS perspective, and the alignment of this perspective with Strong Structuration Theory

(Stones, 2005), Structural Hole Theory (Burt, 2004b) and the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003) in this thesis.

3.4.1 Diversity and dynamic nature of agents

Schools comprise a diverse range of agents, such as students, teachers, senior management and non-teaching staff. There is also diversity among agents that interact with the school from outside, such as parents and outside agencies. Changes in the composition of agents are occurring almost continually. For example, every year a new cohort of students begin, while staff turnover is high in many schools. As described above, this thesis will use Strong Structuration Theory (Stones, 2005), Structural Hole Theory (Burt, 2004b) and the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003) to understand how these diverse range of agents interact with the school structure to produce outcomes (Stones, 2005). Most of the following features of CAS focus on the nature of interaction between these diverse and ever changing groups of agents.

3.4.2 Information flow

Schools typically have organised processes for prioritising the flow of new information throughout the system. For example, in a qualitative study examining schools as CASs, it was shown that responding to communications from the Department of Education was more likely to be prioritised over those from organisations outside of the formal education structure (Keshavarz et al., 2010). Keshavarz et al. (2010) also found that, in general, schools received too much formal and informal information, leading to various levels of productivity of information exchange in school outcomes. Schools also often possess weak structures for collaboration and information sharing (Kremser, 2011). This highlights the need to understand how information is exchanged through existing social networks (Burt, 2004b), power structures and reciprocal determinism between structure and agency in relation to context (Giddens, 1984; Green, 2006; Stones, 2005). This may help to identify how the flow of information is affected by system structure, and the potential for new information, such as feedback on health and wellbeing, to enter the system. The Theory of Health Promoting Schools and Human Functioning could

also be used to explore relationships between groups of stakeholders, such as staff and students, and how this affects information flow (Markham & Aveyard, 2003).

3.4.3 Nested system structure

CASs, such as schools are nested within broader communities and a broader educational system, and have sub-systems (such as year groups and departments) nested within them. Actions within all of these sub and supra systems are likely to have effects on the functioning of other sub and supra systems, and the school system as a whole. Schools possess a degree of freedom to act, but within the confines of rules set by supra-systems, such as inspection authorities. This will be elaborated upon below.

3.4.4 Dependent but autonomous

Keshavarz et al. (2010) proposed that schools have a freedom to act, but that this is limited by a fixed set of possibilities, in part shaped by their nestedness within supra-systems described above. Inspection authorities, or at least the government departments they represent, present an example of supra-systems that schools are nested within and which, in conjunction with broader political and economic contexts, impact upon the range of possibilities available to schools. If health outcomes such as physical activity, emotional wellbeing and hygiene were made a prominent part of inspection processes for example, this may help to increase prioritisation of health improvement activities within schools. In fact, in terms of physical activity, the Welsh Government has previously committed to giving equal weight to both physical literacy and literacy and numeracy. However, they have not fully operationalised this goal thus far (Weiler et al., 2013). The recent curriculum review by Donaldson (2015) commissioned by the Welsh Government included Wellbeing as a key factor within the curriculum going forward, whilst in England, there has been a recent tendency to move towards an ever narrower focus on educational outcomes, such as literacy and numeracy targets. Study of the interactions between systems and governing supra-systems could facilitate better understanding of school system functioning, and a better understanding of what actions schools are able to adopt within existing constraints (Stones, 2005).

3.4.5 Interactions within and between systems

The functioning of CASs is shaped by dynamic interactions within and between systems, sub-systems and supra-systems (Keshavarz et al., 2010). In a school context, this could apply to interactions between departments within schools, or between schools and families, communities or outside agencies (Keshavarz et al., 2010). Outcomes produced by schools are influenced by diverse interactions among agents within and between schools as well as with communities and families. Strong Structuration could be utilised to theorise these interactions in terms of the school structure and agency (Stones, 2005). Structural Hole Theory (Burt, 2004b) could theorise brokerage within and between systems and the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003) could be used to examine relationships and alignment of values between groups of stakeholders. This section will outline the importance of such interactions and their role in school-based health interventions.

CASs have permeable boundaries meaning that they work in synergistic exchange with systems outside of the school gates, such as other schools or public health organisations. Successful collaboration requires a high level of mutual trust and respect, support for joint aims and equal input from all different agencies (Asthana, Richardson & Halliday, 2002; Rummery & Coleman, 2003). Successful partnership working between these systems, sub-systems and supra-systems can present challenges, especially where agencies, such as schools, public health and academic organisations, have different backgrounds, communication styles and language, and incentives for involvement. This highlights the need to provide schools with evidence to establish whether by focusing on the health of their students, they are likely to achieve better exam results, and for school health researchers to attempt to understand competing pressures on schools, and develop shared mechanisms for effective communication. This may help to align public health, academic and school incentives for involvement, thus improving the chances of achieving successful partnership working and common goals (Bonell et al., 2014). This demonstrates the importance of investigating the reciprocal relationship between system structure and agency (Stones, 2005).

Systems are not able to be directly governed by another system, although they can observe other systems and learn and adapt accordingly. This adaptation occurs via internal rules and norms and self-organisation (Johannessen, 1998). For example, Hawe et al. (2015a) conducted qualitative interviews with control communities of primary health care teams and community agencies within an intervention to reduce post-natal depression and promote maternal health. They found systems to have adapted through lateral thinking and innovation due to being aware of the intervention but not being supported to implement it (Hawe et al., 2015a).

Collaboration with sub-systems within the school gates

Collaboration between sub-sytems: school staff

School staff form groups within complex systems which form nested subsystems, including for example, staff associated with a particular department or year group. Complex systems often have distributed control, rather than hierarchical, central leadership (Keshavarz et al., 2010). This is demonstrated by the leadership of health and wellbeing in schools, which is often delegated to another member of staff rather than the Head Teacher. Meanwhile decisions are still often made collaboratively by this staff member, administrative staff and the Head Teacher. The support of and collaboration with senior management has been found to be important for changes to be implemented in terms of health improvement in school systems (Fletcher, Fitzgerald-Yau, Wiggins, Viner & Bonell, 2015).

Shiell et al. (2008) emphasise the need to study relational data to establish the position of key actors and collaboration within CASs, including brokerage between them, as theorised by Structural Hole Theory (Burt, 2004b). In a study of organisational learning in a health-promoting schools network in Austria, it was found that the network only reached certain central agents, such as the school Health Promotion Coordinator, suggesting problems with information exchange within such networks and systems (Flaschberger et al., 2013). Therefore, an increased focus on organisational learning through communication and coordination within and between schools and improved resources and organisational structure are required (Gugglberger, 2011). In a qualitative study of HPS, it was shown that school staff tended to prefer direct consultation and were reluctant to attend network meetings

(Gugglberger, 2011). Moreover, teachers have a tendency to strive for autonomy due to pressures to succeed and a heavy workload, which may hinder collaboration and teamwork within the school setting (Flaschberger et al., 2013). This suggests that further research to investigate how to involve the whole school in health promotion is required, and that efforts to engage schools in change processes need to attend to identifying individuals and groups who are sufficiently well positioned within their social networks to drive forward change, such as those in brokerage positions (Burt, 2004b).

Collaboration between sub-systems: Students and staff

Within CASs, students make up many key sub-systems. The importance of involving young people in health promotion has been advocated by the WHO (1998) and is central to the HPS Framework (Buijs, 2009). The Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003) also advocates for breaking down barriers between staff and students, although it specifies that this does not have to be directly related to health in order to affect health outcomes. Student participation is seen as integral to the HPS whole school approach to enable students to achieve a higher level of control over health determinants (World Health Organization, 1986). Although involving young people is encouraged, there are no specific guidelines to follow. Moreover current approaches, such as school councils are often perceived negatively due to a lack of tangible outcomes and genuine collaboration between staff and students that arise from such approaches (Fletcher et al., 2015).

In support of this, a systematic review demonstrated that student councils are most beneficial for those students that are directly involved, but that all students benefit to some extent from changes to the school organisation/environment and ethos. The review concludes that student councils should be in place alongside other methods for student participation (Simovska, Griebler & Nowak, 2012). Involving young people in health promotion and ensuring that they have a voice and that their opinions are valued has been shown to increase motivation for health improvement and learning of students (Samdal & Rowling, 2011).

Collaboration with systems outside the school gates

Collaboration between systems: Families and schools

Families are a key external system which schools constantly interact with. Engaging families with schools is often a difficult task, especially in deprived or ethnic minority groups (Smrekar & Cohen-Vogel, 2001). Most research into parental engagement has focused upon education rather than health. Positive effects of engaging families, such as cognitive development (Hoover-Dempsey & Sandler, 1997) and educational outcomes (Lee & Bowen, 2006), have been demonstrated. Moreover, research focused on parental involvement in their children's education has investigated barriers and facilitators to such involvement. For example, one such study found that parental engagement was influenced the most by invitations from teachers, compared to parental resources and efficacy (Anderson & Minke, 2007). Interaction between the systems of schools and families can be theorised using the Theory of Health Promoting Schools and Human Functioning, whereby reducing the barriers and aligning values between these systems may contribute to increased student connectedness (Markham & Aveyard, 2003). Moreover, Structural Hole Theory could help to identify brokerage roles that facilitate this interaction (Burt, 2004b).

In a systematic review of the WHO's HPS framework, Langford et al. (2014) stated that in order to have a significant impact on the health of school children, health messages need to be reinforced by parents at home. Thus parental and family involvement is also an important aspect of health promotion in schools. The review concluded that family and community engagement was often the least intensive, and least well implemented, aspect of the HPS programme compared to the focus on curriculum and school ethos and environment, and that the majority of parental engagement involved providing information to parents about health promotion efforts and advice on how to reinforce these messages at home, often via newsletter (Langford et al., 2014). Moreover, within this review (Langford et al., 2015; Langford et al., 2014) of HPS approaches, engaging parents was reported by study authors to be the most challenging aspect. The statistics supported this, with around one third to one half of parents found to participate in interventions targeting this aspect (Langford et al., 2015). The factors affecting engagement of parents and families from lower socioeconomic backgrounds requires investigation in the UK, as

it is often parents who are more engaged and often those from less deprived groups who volunteer to participate in such studies (Hoover-Dempsey & Sandler, 1997).

A review of the Welsh Network of Healthy Schools Scheme (Rothwell et al., 2010) found that school staff and Healthy Schools Coordinators both perceived difficulties when trying to initiate and maintain parental engagement in Healthy Schools Schemes. Additionally, Head Teacher perceptions of low parental commitment and even opposition to health improvement activities within the school were reported. This suggests that further research employing a complexity lens may facilitate investigation of the reasons behind low levels of parental engagement within school systems, such as lack of commitment or the manner in which parents were asked to engage (Rothwell et al., 2010).

Collaboration between systems: Other schools, outside agencies and schools

Implementation of health improvement typically depends on collaboration with agencies beyond the school gates, which may include policy and practice stakeholders, and academics. Collaboration between schools and academics is increasing, but there is a need for reciprocity in terms of support and aims (Bevins & Price, 2014).

Self-organisation refers to a tendency for the actions of agents within a system to lead to order arising spontaneously (Zimmerman, Lindberg & Plsek, 1998). Self-organisation within the health, education and political systems has been cited as a barrier to inter-system collaboration in a study of implementation of health promotion in the Scottish school system due to the development of their own culture, terminology and methods of working (Gugglberger & Inchley, 2012). It has also been suggested that it is important to embrace complexity by collaborating with policy makers to exert influence at multiple levels as well as with organisations with similar agendas to prevent multiple siloed programmes and to exploit synergies between organisations (Dooris, 2013). These should not be restricted to programmes with a health agenda as interdisciplinary collaboration, such as between health and educational organisations, could facilitate innovation in the field and lead to whole system level change (Dooris, 2013). Dooris (2013) also highlights the need to share

experience and learning across organisational settings. However, barriers to such collaboration have been identified, such as personality clashes and competition between organisations (Dooris, 2013).

Gugglberger (2011) conducted a qualitative study with key stakeholders for a HPS scheme in Austria, identifying five key capacity building strategies for healthy schools. These were organising exchange among schools, using certification and quality control for HPS, offering consultation and information, carrying out health promotion programmes with specific aims and coordinating available actors and information. A study in the Netherlands developed a whole school collaborative model for needs-based health improvement (Leurs et al., 2005). This highlighted the importance of collaboration between schools and local institutions and the inclusion of school-based stakeholders, including students. Keshavarz et al. (2010) argues that schools may not communicate effectively with their environment and that there may be inadequate support and guidance for providing support for schools to do so. This may also be related to the rules and ethos within the school, which will be elaborated upon further below.

3.4.6 Rules and ethos

Schools are governed by formal rules, rules internalised by individual agents, and more informal school ethos. There is also a complex interaction between these leading to the inconsistent adherence to rules (Keshavarz et al., 2010). Rules also form part of school structure and interact with agency to affect system functioning (Stones, 2005). Keshavarz et al. (2010), in a study of the implementation of whole school approaches in Australia, found limited rules and curriculum relating to health, thus limiting the importance placed on health outcomes within a school setting. In contrast, Moore et al. (2016) found that nearly half of schools in Wales had written health action plans, showing a highly variable organisational commitment to health. The presence of such commitment may facilitate the creation and formalisation of new system norms.

Context encapsulates the formal rules and management structures as well as school ethos, among other factors (Keshavarz et al., 2010). Keshavarz et al. (2010) observed

that schools are constantly adapting to changing contextual conditions, such as the socioeconomic status of the students, but that this self-organisation and flexibility was hindered by limited resources, leading to prioritisation according to the rules and goals of the school system. Schools self-organise through the interaction of agents with their own rules and norms, such as nutrition policies. This interaction between agency and school rules, which form part of the structure, could be theorised using Strong Structuration Theory (Stones, 2005). Moreover, assessment of brokerage could help to study how rules are normalised throughout the system (Burt, 2004a) and the Theory of Health Promoting Schools and Human Functioning could be employed to explore the link between rules and ethos and the breaking down of barriers between groups of stakeholders (Markham & Aveyard, 2003).

Interventions will trigger self-organisation processes which may wash out the new intervention or integrate it into its functioning. Therefore, it is important that interventions or programmes to improve health are not trying to micro-manage schools from the outside (Gugglberger, 2011). It is also important that interventions are designed to be aligned with the core aims of schools to increase the likelihood of the intervention being assimilated into the system. An attempted disruption to the system to introduce something which is not aligned to the ethos of schools may result in agents' collective actions working towards self-organisation, thus returning the system to its previous functioning and resulting in the intervention being washed out rather than being integrated into new system functioning.

The review by Langford et al. (2015) which focused on HPSs, found that two studies specified that implementation was hindered by an emphasis on academic subjects over and above PE. They described a prioritisation of tests through the removal of students from their PE class and preparation for inspection as prominent factors. They also found that no interventions included measures of academic attainment, thus recommending that these measures should be routinely incorporated into RCTs to align these priorities with policy makers (Langford et al., 2015). Aligned with this, a recent study of school commitment to health demonstrated a decline in time allocated to PE in Year 10 (age 14-15 years), which coincides with the beginning of students' final exams in mandatory education (Moore et al., 2016). Thus, at a time

when physical activity is likely to be in decline anyway among teenagers, schools scale back their provision in order to focus on educational attainment. Providing schools with feedback on health and health related practices may serve to act as a feedback loop, as will be described below, but this may depend on the alignment of this information with school norms and values.

3.4.7 Feedback loops

A positive feedback loop occurs when feedback is given which increases the rate of change of a variable within a complex system, whereas a negative feedback loop occurs when this process is slowed or reversed due to the feedback provided (Hawe et al., 2009b). Keshavarz et al. (2010) identified that, in order to develop HPS, feedback loops, rules and credit attribution mechanisms regarding schools' performance on health should be developed. Although a complete understanding of all components and their interactions can never be accomplished, evaluation can play a role in reducing uncertainty (Moore et al., 2016; Wong, 2013). For example, if a complex setting were to be monitored closely, the information gathered could potentially be used to harness complexity by enhancing positive feedback loops and counteracting negative ones between the different levels of the system (Axelrod & Cohen, 2000). Furthermore, by closely monitoring system context prior to intervention, the way in which existing feedback loops contribute to the maintenance of current practice can be understood. This is closely linked to the reciprocal relationship between structure and agency outlined in Strong Structuration Theory (Stones, 2005). This may enable self-organisation to be harnessed (Hawe et al., 2009b; Tseng & Seidman, 2007) and may help to monitor non-linearity and unpredictability within complex systems (Byrne, 1998). As described previously, schools often receive substantial feedback on educational performance, though less related to health.

3.4.8 Non-linearity and unpredictability

Due to the complexity of systems, such as schools, it is difficult to associate macro-level or policy and organisational changes and outcomes with micro level or social and individual processes. In a complex system, outcomes emerge as a result of dynamic interplay between actions and context (Byrne, 1998), consistent with the

duality of structure and agency (Stones, 2005). Hence, outcomes could be greater or less that the sum of their parts, as causal factors reinforce or cancel each other out in non-linear ways (Byrne, 1998). This non-linearity is related to the extreme sensitivity to initial conditions in complex systems, slight differences in starting points giving rise to big differences in outcomes (Byrne, 1998). Thus, in a complex school system, cause and effect are often disproportionate and separated in terms of time and space. Additionally, it is difficult to determine whether effects should be attributed to system level or individual level properties (Maroulis et al., 2010). For example, test results may be attributed to the quality of the school, rather than the intelligence of individual students, or vice versa. A further example could be the attribution of a high level of obesity in a school to individual psychological processes, such as self-esteem, rather than macro level factors, such as the accessibility of unhealthy food and school and family socioeconomic status (SES).

It is imperative that the way in which current system dynamics maintain prevailing practice through self-organisation are understood before implementation occurs as this will affect how and the extent to which an intervention is integrated into normal practice. Subsequently, the characteristics of such systems should be utilised to inform the design and implementation of complex interventions, their theories of change and their evaluations. This will help to ensure that characteristics such as non-linearity and the way in which different levels of the SEM change and interact over time are drawn upon and captured effectively (Shiell et al., 2008).

3.4.9 Change and co-evolution

Collaboration and teamwork are viewed as important in organisational learning and change by school stakeholders and researchers (Gugglberger, 2011; Samdal & Rowling, 2011) and the Ottawa Charter led to organisational networks being used to support this change within schools and other health promotion settings (Flaschberger et al., 2013; World Health Organization, 1986). Engagement between systems and subsequent adaptation is known as structural coupling (Kremser, 2011). Systems and interventions constantly adapt to one another over time due to interactions between agents and structures, as well as information flow and feedback loops (Keshavarz et al., 2010). Efforts to promote school health may be more likely to succeed by

playing a guidance role, providing schools with the information and resources that they need, but not trying to overly manage their health promotion practices from outside the system. Leurs et al. (2005) emphasise that a collaborative working group of school stakeholders should be at the core of any health improvement approach to promote ownership.

For interventions in complex systems, some would argue that form may differ according to context, but as long as the function and theoretical basis of the intervention is consistent across contexts, fidelity is considered to be upheld (Hawe, Shiell, Riley & Gold, 2004a). This demonstrates the importance of gaining an understanding of path-dependent actions and consequences in order to successfully roll-out interventions across various settings (Paina & Peters, 2012). Understanding the complexity of school system starting points, prior to intervention, would enhance the ability of researchers to intervene to create conditions under which change can emerge through a process of learning and adaptation. This is as opposed to attempting to engineer change under controlled conditions irrespective of the complex phenomena that will inevitably be affecting the outcomes (Keshavarz et al., 2010; Paina & Peters, 2012). This emphasises the importance of viewing context, complex system functioning and how these work synergistically with interventions to produce an outcome which is greater than the sum of its parts, as the main focus of research (Hawe, 2015). This is consistent with Strong Structuration Theory, which provides a practical way of studying this through its focus on the reciprocal relationship between structure and agency, and how this leads to outcomes or changes in system functioning (Stones, 2005). This is also relevant to capturing emergent outcomes.

3.4.10 Emergence

Within CASs, outcomes may emerge suddenly in response to an intervention, or a long time after the intervention has been implemented, with actions giving rise to outcomes in a highly unpredictable and often disproportionate manner (Keshavarz et al., 2010; Rickles, Hawe & Shiell, 2007). This is particularly true of decentralised systems, such as schools, in which different departments self-organise, create their own norms and become greater than a sum of their parts. This occurs at a bifurcation

point, whereby the system reaches a point where it will change dramatically in one way or the complete opposite, usually unexpectedly (Rickles et al., 2007). For example, small stimuli, such as a change in lunch break duration or improved access to playing fields, may cause a sudden change in system functioning within a school.

Emergence is dependent upon a system's components, rules, interactions, information, values, context, time, actions of other systems and resource availability (Keshavarz et al., 2010; Paina & Peters, 2012). Interactions and feedback loops are shaped by historical constraints of the system (Sturmberg & Martin, 2009), highlighting the importance of taking into account emergence when implanting and monitoring interventions by considering adaptation, flexibility and learning (Paina & Peters, 2012). An example of this process in the educational literature is a study by Woodland et al. (2014) which conducted social network analysis with school staff. The results were then utilised to harness complexity by reconfiguring teacher groups to reduce isolation and improve collaboration among teachers, with the aim of increasing system capacity for innovation in teaching. Despite the complexity of the school and most health settings, the majority of theories and conceptual frameworks and methodologies are reductionist and do not account for dynamic systems, interactions and unpredictable, emergent properties (Van Beurden, Kia, Zask, Dietrich & Rose, 2013). Despite this, within a CAS framework, Strong Structuration Theory could provide a practically applicable theory to facilitate the understanding of the relationship between structure and agency and how this results in emergent outcomes, or system functioning (Stones, 2005).

3.4.11 Examples of interventions designed in a manner consistent with a view of schools as CAS

According to CAS thinking, there is a need to understand system functioning and use approaches to intervention development which recognise variation in system starting points. This may facilitate the development of contextually tailored interventions which maintain fidelity in terms of function rather than form (Hawe et al., 2009b; Patton et al., 2003). Data-led needs assessment provides a potential method of doing this and achieving consistency with a complex systems perspective. There are some promising examples within the literature of efforts to support schools in the use of

data-led needs assessment on health-related issues to adapt interventions to different contexts in this manner. Such efforts work to shape school health improvement, and subsequently, student health through employing a set of standardised processes rather than standardised intervention form.

In Canada the School Health Action Planning and Evaluation System (SHAPES) pioneered school feedback systems which provide tailored feedback on student health (Cameron et al., 2007; Leatherdale, Manske, Wong & Cameron, 2008). Moreover, the Alberta Project Promoting active Living and healthy Eating in schools, provided feedback reports on diet and physical activity to schools with provincial data for comparison, with trained School Health Facilitators supporting dissemination, translation and application of data within a HPS framework; positive impacts on diet, physical activity and obesity have been observed (Schwartz, Karunamuni & Veugelers, 2010; Storey, Spitters, Cunningham, Schwartz & Veugelers, 2011). This was however a highly resource intensive model, involving the installation of a new full-time health facilitator into every school. Hence, it is perhaps unlikely to be a scalable model, particularly in a political climate in which resources are scarce. Therefore, key questions remain surrounding how best to support schools in using data for needs assessment and action planning, supporting existing staff (i.e. Wellbeing Leads) in more efficiently and effectively achieving change in school systems. Implementation of action research groups has been employed elsewhere to achieve school system-level change for pre-specified health issues (Bond, Glover, Godfrey, Butler & Patton, 2001; Bonell et al., 2015). School action groups as well as the use of local survey data could help to create positive feedback loops and achieve system level change within different contexts.

Two examples of interventions which explicitly incorporate a recognition of variability in system starting points as part of a whole school approach are the Gatehouse Project, which focused on improving health risk behaviour (Bond et al., 2001; Bond et al., 2004) and the Inclusive Study, which focused on reducing bullying and aggression (Bonell et al., 2015; Fletcher et al., 2015). These interventions were designed as a set of processes, which aimed to understand the needs of a specific system in order to adapt the intervention to take contextually

appropriate action within each school, whilst remaining true to intervention logic (Hawe et al., 2004a; Patton et al., 2003).

The Gatehouse intervention was a whole school intervention to improve social and learning environments in Australian schools and was implemented through conducting a survey of the school climate to measure student perceptions of security, communication and participation within the school. This allowed for an assessment of the pre-intervention context, which was used to provide individualised school-level feedback. A school-based action team was also created (Patton et al., 2003). These action teams were unique to each school and comprised of a team adapted from existing relations within the school, including staff involved in senior administration, curriculum, student welfare, heads of year, students and external agencies and were often embedded within the schools' formal organisational structures. Action teams also consulted with researchers from the project who acted as external 'critical friends' to facilitate implementation.

Implementation processes varied across schools due to differing levels of readiness to change and availability of resources. The provision of health reports assisted with the utilisation of existing and new health promotion programmes to respond to the needs of each school in an individualised manner, leading to a decrease in risk of 3-5% between intervention and control groups for drinking, smoking and friends' alcohol and tobacco use. No significant effects were observed for social relationships, school connectedness or depressive symptoms (Bond et al., 2004). Although the Gatehouse Project was forward thinking for its time in moving towards a settings approach and away from individualised behaviour-led interventions, it was not explicitly designed or evaluated using a complex systems framework. Since then, CAS thinking has advanced and the programme has been considered and critiqued from a complex systems perspective (Hawe et al., 2009a). For example, the fact that schools were given freedom, within certain boundaries, to adapt the intervention to local context is compliant with a complex systems perspective, as is the strong emphasis on understanding context prior to developing contextually appropriate interventions. Moreover, the authors described how they extended this methodology within a Gatehouse replication study, named Creating Opportunity for Resilience

and Engagement (CORE), by employing longitudinal social network analysis with teachers to study the dynamics of change processes (Hawe et al., 2009a).

The Inclusive study provides a further example of an intervention based on standardised process, whereby pre-intervention context data was collected and utilised for tailoring to context. Pre-intervention context data consisted of a survey of the prevalence and determinants of bullying and aggression. The logic model specified that an action group decided priorities and school rules and policies and peer mediation were reviewed and revised in light of the pre-intervention contextual data (Bonell et al., 2014). In addition to this, school staff received training and a new Year 8 social and emotional skills curriculum was implemented. This resulted in both students and staff reporting that priorities for reducing bullying and aggression in schools were identified using the school survey data and subsequently acted upon. The data served to either validate and reinforce staff and students' preconceived ideas regarding the priorities that needed to be addressed, or to help them to discover new priorities which they were not aware of previously (Fletcher et al., 2015). However, this pilot study excluded the most deprived schools who were rated as 'unsatisfactory' by the independent schools' inspectorate. These schools may have a high rate of aggression and bullying and thus, it remains to be seen whether this type of partnership working and involvement of young people could have a positive effect in more deprived schools (Fletcher et al., 2015).

Both the Gatehouse and Inclusive interventions incorporated school action groups, of which staff students, parents and families were members. This is a way of connecting and supporting information flow between many of the sub-systems within the school and other systems external to the school, such as year groups and classes. However, there is only so much that can be actioned as a result of these action groups, as complex school systems are dependent yet autonomous. Therefore, they may only action suggestions from the group within a set of fixed possibilities and within the rules of the school (Keshavarz et al., 2010). For example, the level of support for change from senior management may act as either a barrier or facilitator. Despite this, the Gatehouse Project found that an advisor collaborated with and guided school health improvement teams effectively through needs assessment,

planning, implementation, evaluation and reassessing priorities (Bond et al., 2001). The Inclusive study also found that structural changes were more likely in one school where a new Head Teacher had just been appointed, thus highlighting that a higher level of willingness to change may be seen in schools with relatively new management teams (Fletcher et al., 2015).

The above represent examples from the literature of understanding system context prior to intervening and utilising the knowledge obtained to strategically target aspects of the complex school system. Hawe (2015) goes as far as to state that researchers have a moral obligation to ensure that any intervention designed is likely to fit with its system and hence have a likelihood of effectiveness. These findings demonstrate the need to take into account the different starting points of each system, before intervening and to design interventions which may be adapted according to the needs of each school. However, while such feedback loops may work to increase schools' awareness of their strengths and weaknesses in terms of health, these may only induce change if schools value these outcomes. This highlights a need for dual action, whereby feedback is coupled with persuading schools to value health outcomes and, thus, altering rules and ethos. Rules and ethos were targeted by the interventions outlined above. For example, the Gatehouse project attempted to enhance students' feelings of security, self-regard and positive communication (Bond et al., 2001), whilst the Inclusive project targeted bullying and aggression (Bonell et al., 2015). Moreover, the Inclusive study found that the intervention was prioritised within schools as the emphasis on increasing student voice and participation could be used to impress the national school inspectorate (Bonell et al., 2015; Fletcher et al., 2015).

Further to this, the non-linearity and unpredictability of complex systems is demonstrated by the various unpredictable outcomes within the Inclusive schools (Fletcher et al., 2015). For example, one school did not include a senior member of staff within their action group and had relatively few actions delivered compared to the other schools. In contrast, a Head Teacher from a different school commissioned new surveys and accessed additional data sources. The outcomes of both projects, such as a decrease in the reporting of regular smoking among students in the

Gatehouse project, demonstrate change and emergent outcomes. This is likely to be caused by a combination of all parts of interventions and the way in which they interact with the characteristics of the complex systems in which they are implemented (Keshavarz et al., 2010).

Despite this consistency with CAS thinking, measurements of pre-intervention context were limited and consisted solely of surveys to measure student perceptions of the school climate and the prevalence and determinants of health-related behaviour (Bonell et al., 2015; Patton et al., 2003). Whilst this facilitates the identification of priority areas, employing further research methods could help to obtain a more in-depth understanding of the functioning of a complex system and reasons behind student perceptions. This would inform intervention design to a greater extent in a manner consistent with CAS thinking.

3.5 Research methods and use of theory to understand complex systems

Whilst Section 3.4 discussed the extent to which schools can be conceptualised within a CAS framework, it also identified the limited intervention research that is consistent with this approach. This is particularly true with regards to the investigation of variance in system starting points or functioning to inform intervention design. Therefore, there is still limited knowledge regarding how to measure, theorise and evaluate complex system functioning in a manner consistent with a CAS thinking philosophy (Hetherington, 2013). This section will consider the implications of this.

3.5.1 Ontology, epistemology and complexity

Tremblay & Richard (2011) argue that CAS thinking can be seen as a paradigm in its own right. In terms of epistemology, CAS thinking can be used to conceptualise health in a non-reductionist, reflexive manner (Tremblay & Richard, 2011). They also argue that CAS thinking contrasts with naive realism due to its recognition of experiential individual knowledge. However, there is growing recognition of compatibilities between CAS thinking and critical realism. Many researchers have argued that critical realism can be effectively combined with CAS thinking and used

to provide an explanation for complexity, as they share a philosophical basis (Callaghan, 2008; Westhorp, 2012; Wong, 2013).

From a critical realist perspective, our empirical understanding of reality is always partial, socially constructed and situated. Empirical data can be used to make inferences about actual patterns of system behaviour and the real mechanisms which drive them. However, it does not offer a transparent window into objective realities. Thus, critical realism posits an objective reality which is independent of the context and the researcher, though acknowledges the socially constructed nature of our understandings of those realities. CAS thinking also assumes a reflexivity of researchers that moves beyond ontological realism and determinism, whereby knowledge is always obtained via an individual's subjectivity, history and position on the construction of knowledge (Tremblay & Richard, 2011).

3.5.2 Cause and effect and complexity

There are often indirect pathways between cause and effect and, as a consequence, sets of causes, and causes of causes, should be taken into account (Galea, Riddle & Kaplan, 2010). The use of multilevel modelling could be an effective way of dealing with complexity by assessing the contribution of factors at multiple levels, whilst simultaneously accounting for extraneous variables which may affect outcomes (Galea et al., 2010). This should be coupled with other methodologies, such as case studies, to capture in-depth relationships, causal pathways and emergent phenomena. The use of mixed methods could help to capture complexity by linking these macro-level outcomes with micro-level processes. This could facilitate the discovery of unanticipated systemic consequences of interventions, thus increasing the policy relevance and practical applicability of research outcomes (Maroulis et al., 2010; Riley, Hawe & Shiell, 2005). Implementing small changes and monitoring the consequences could further increase understanding of highly ambiguous and uncertain systems, such as schools.

3.5.3 Social Network Methods and complex adaptive systems thinking

As described above, interactions among agents within a complex system are conceived within CAS thinking as shaping system functioning. Social network

analysis presents a useful method for assessing the context and structure of a CAS both to understand prior system functioning, and changes and emergent outcomes during and after intervention implementation (Hawe & Ghali, 2008). Social network analysis generates a range of metrics which relate to the position of key actors within their social network, and the nature of the network as a whole. This can be employed using a cross-sectional or longitudinal design to capture both the diversity and dynamic nature of agents within CASs (Hawe & Ghali, 2008; Keshavarz et al., 2010). Examples of measures used within social network methods include degree and betweenness centrality, density and cliques. Degree centrality is a measure of the number of ties an individual has to others in the network (Hawe, Webster & Shiell, 2004b). Betweenness centrality is a measure of brokerage measuring whether alters, or individual nominated as members of a network (Burt, 1984), sit on the shortest path between other nodes. Density is a measure of the percentage of potential ties which are present in a network (Hawe et al., 2004b). Whilst a clique is a subset of three or more alters who are all connected to one another, where no other alter is connected to all of the clique members (Wasserman & Faust, 1994). Cliques may indicate the presence of a small shared group setting in which more than two people interact.

As described, interventions can be viewed as attempts to alter how actors within a complex system interact with one another. For example, an intervention as simple as a new written policy aims to establish and communicate new norms for acceptable and unacceptable ways of behaving within a school system. A new educational intervention requires staff and students to interact in a particular way. In light of this, Hawe & Ghali (2008) emphasise the need to understand pre-existing relationships and strategic positions of key players within a setting to assess how an intervention may change social structures and how this may link to information flow, interactions within and between systems and changes in rules and ethos (Keshavarz et al., 2010). This may help to track progress and assess whether feedback loops increase the likelihood of success or sustainability of such interventions (Keshavarz et al., 2010). They propose that this should be undertaken as part of an assessment of the school environment alongside qualitative methods, such as interviews and focus groups prior to intervening (Hawe & Ghali, 2008).

Interventions may aim to bridge structural holes and increase collaboration between sub-systems (Burt, 2004b; Hawe et al., 2009b). The strength of weak ties is a further phenomenon which is posited by Granovetter (1973) and suggests that weak ties may act as bridges or gatekeepers to important agents within a social network. Thus, the structural holes, the strength of ties and the context surrounding them may be of interest within CASs. Furthermore, in order to adhere to CAS thinking, it is important to consider the fact that CASs are unbounded, often interacting with many external systems and overarching supra-systems. Thus, this involves venturing outside the physical boundaries of a school to capture the nested system structure (Chadderton & Torrance, 2011; Hetherington, 2013). This may point to the use of ego network, over whole network analysis, which collects network data from the perspective of one 'ego' and, thus, does not require the network to be bounded (Moolenaar, 2012).

Combining social network analysis with CAS thinking could help to enhance understanding of variance in the pre-intervention system functioning and the antecedents and consequences of such networks in terms of health improvement activities and outcomes (Moolenaar, Sleegers & Daly, 2012). The integration of Strong Structuration Theory and Structural Hole Theory could further help to theorise how these structures are formed by and interact with individuals' intrinsic factors and agency to affect variance in pre-intervention system functioning (Burt, 2004b; Stones, 2005). For example, how structures affect information flow within and between systems (Burt, 2004b). Hawe & Ghali (2008) have conducted one of the few studies to date using social network analysis to understand staff social networks within schools. They analysed the density of relations in a secondary school setting in Canada, as well as the centrality of key staff before a whole-school mental health promotion intervention, modelled on the Gatehouse Project (Bond et al., 2004), was introduced. They found network density was related to relationship intensity, as density was higher for knowing a person by name than for socialising outside of school (65.9% and 5.9%, respectively). Use of a brief survey method, while sacrificing some depth, allowed them to gain an overview of the whole network and insight into density due to a response rate of 94%.

Reporting some of the same data as the above study, Hawe et al. (2015b) replicated the Gatehouse Project in Canada in one school to learn more about how to conduct a whole school system level intervention. They employed whole school social network analysis to measure change in school staffing structure and interactions. Results showed that density significantly increased from baseline to 12 months for five types of relationship; recognise by name, socialise with, regular conversation with, know more personally, seek advice for a school matter. Results for student outcomes showed a positive change in low school engagement, drinking, unprotected sex and poor health for girls, but no significant change in depressive symptoms. This sits in contrast to the Gatehouse Project (Bond et al., 2001), described above, which observed improvement in health behaviours among boys and girls, but no increase in school connectedness. However, Hawe et al. (2015a) only conducted the intervention in one school, with no comparison group and the baseline social network data were collected retrospectively alongside the follow-up data.

A further study implementing social network analysis techniques investigated its utility in measuring collaboration between child care workers in day care for obesity prevention (Marks, Barnett, Foulkes, Hawe & Allender, 2013). They used eight closed questions within a survey to measure the frequency and value of information exchange and who was involved in decision making, consultation and network sources of dietary information. They achieved a response rate of 85%. Out of the two day care centres, they found that networks for general communication took a similar form, whereas those for specific information showed distinct differences. They also found decentralised, dense information structures in relation to dietary and activity planning. This study only included two day care centres, limiting generalisability, and did not measure informal ties (Marks et al., 2013). This is particularly important as informal emergent relationships often differ from formal hierarchies in a school setting (Hetherington, 2013; Spillane & Healey, 2010). For example, in a multisite after school care intervention a density score of only 2% was found between the various programmes, whilst the level of skill transfer between staff was found to be 77%. This suggests that the skill transfer may have occurred outside of the formal structures which were in place and demonstrates the importance of measuring

informal as well as formal ties. It also demonstrates the importance of utilising these informal ties to harness information flow within and enhance health improvement activity within a CAS (Ramanadhan, Wiecha, Gortmaker, Emmons & Viswanath, 2010).

Interactions among agents and the social position of agents within a network may facilitate the understanding of phenomena, information and resource exchange within school systems. Hawe et al. (2004a) emphasise the need to employ a combination of qualitative and quantitative methods to gain an in-depth understanding of the context within CASs in order to capture emergent outcomes and begin to understand and theorise what worked and why. As part of this, network analysis was used to assess collaboration and contact between organisations in a community intervention to reduce post-natal depression. Ties were assessed between organisations through telephone surveys, usually with one key informant from each organisation, unless discrepancies needed clarifying (Hawe et al., 2004a). However, the key informants, even if they were within the SMT, were unlikely to know the details of 100% of interactions their organisation has with others and may not be able to speak reliably about the quality of these relationships. This could infer that the presence of important informal ties between organisations were missed. Therefore, this could be enhanced through mixed methodology.

It is imperative that strategic positions of key players, the meaning that actors attribute to intervention events and the extent to which interventions are embedded within their organisation context are considered (Foster-Fishman, Nowell & Yang, 2007). In a school setting, this would relate to teachers, students, governors and parents, among others. Additionally, it is important to monitor changes in roles and resources and information flow across the organisations and what people stop doing, or displace due to the introduction of feedback loops regarding the health of their students (Hawe et al., 2009b). Previous research into teacher collaboration has shown social networks to facilitate organisational reform for educational outcomes through sense-making, collective learning, co-evolution and adaptation to specific classroom situations and a shared understanding of goals (Daly & Finnigan, 2010; Moolenaar, 2012). Innovations are more likely to be accepted within schools that

have a higher frequency of teacher interaction (Moolenaar, Daly & Sleegers, 2010) and thus efficient information flow and nested system structure (Keshavarz et al., 2010). This could relate to the reform of school systems for the purpose of health improvement and highlights the need to include a measure of the social networks within a system when assessing the context of a CAS prior to implementing and during an intervention (Hawe & Ghali, 2008).

3.5.4 In-depth case studies and Complex Adaptive Systems thinking

Whilst the use of cluster randomised controlled trials is advocated (Hawe, 2015), such traditional quantitative designs are not always appropriate to capture changes in complex systems as, even when cluster randomisation is employed, this may not eliminate bias due to the high context-dependence on initial conditions that are individual to each CAS (Shiell et al., 2008). Hawe and Ghali (2008) propose that flexible qualitative methods, such as interviews and case studies should be conducted alongside social network analysis in order to obtain an in-depth understanding of variance in pre-intervention system functioning from the perspective of multiple actors. This could form part of an in-depth case study, a methodology that has been endorsed by researchers in the field of education as aligned with CAS thinking (Byrne, 2005; Haggis, 2010).

Although the use of multiple methods with case studies can generate thick description of a case and a more thorough understanding of complexity and uncertainty, the use of in-depth case studies may limit the ability to generalise (Hetherington, 2013). However, it can be argued that the unique nature of each school context highlights the importance of designing interventions to promote transferability of key processes to different contexts.

Hetherington (2013) also emphasises the need to acknowledge complexity to obtain insight into interactions within a system, both in terms of a formal hierarchy and more informal emergent relationships, and the effect of time. Temporal influences would be more prominent during implementation and process evaluation in order to capture emergence, than understanding the system prior to implementation. Although this does not enable us to discern cause and effect, it can improve

understanding of the process by which systems evolve throughout an intervention. Moreover, there is a need to consider researcher reflexivity as the decisions that a researcher makes throughout their interaction with the system under investigation could have an effect on system functioning (Hetherington, 2013).

3.6 Conclusion

This chapter provides an overview of CAS thinking and its advantages over traditional approaches to school health improvement. Further to this, it provides an overview of the extent to which key features of CAS thinking are compatible with Strong Structuration Theory (Greenhalgh & Stones, 2010), Structural Hole Theory (Burt, 2004b) and the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003), before presenting key arguments for the conceptualisation of schools as CASs (Keshavarz et al., 2010). However, since it is still an emerging concept, a challenge facing school health researchers is to realise the potential of CAS thinking and its implications for research methods and design. There is also a need to accept and acknowledge the inevitable level of uncertainty conceptualised within this approach (Haggis, 2010).

There have been a few attempts at understanding how schools engage with efforts to bring about change from a CAS perspective (Bond et al., 2004; Fletcher et al., 2015). However, there is a need to step backwards and undertake a more in-depth investigation of the functioning of complex adaptive school systems prior to intervening. This shifts the emphasis from complexity of the intervention itself, to complexity of the system into which it will be implemented. It has been argued that understanding the system could represent an extra stage to the MRC Guidance on complex interventions prior to intervention development (Anderson, 2008) and could potentially be used to harness complexity and improve the chance of intervention success by enhancing positive feedback loops and counteracting negative ones between the different levels of the system (Axelrod & Cohen, 2000).

Furthermore, CAS thinking requires the application of a broad range of methods to understand system functioning prior to intervening, capture emergent outcomes and account for the fact that system functioning is greater than a sum of its parts, thus

rendering traditional component testing irrelevant (Hawe et al., 2009b). This thesis will, therefore, be approached from a complex systems perspective, whilst aspects of Strong Structuration (Greenhalgh & Stones, 2010; Stones, 2005), Markham and Aveyard's Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003) and Structural Hole Theory (Burt, 2004b) will be synthesised to provide a integrative framework for this thesis. The integration of these theories, and their application to evaluation methods will help to obtain a more in-depth insight into system starting points and help to synthesise the elements of CAS thinking.

This thesis will build upon the literature outlined within this chapter by advancing the depth of exploration of system starting points or pre-intervention system functioning. It will aim to explore the variance in health improvement processes and level of engagement with SHRN within different school systems through conceiving schools as CASs. Survey, social network and qualitative methods will be employed and theorised in a manner consistent with CAS thinking.

4 Methodology

4.1 Introduction

This chapter outlines the research methodology employed within this thesis. It begins by providing an overview of the research aims and questions. Then the epistemological and ontological stance from which this thesis was approached is discussed, before moving on to a discussion of the merits of mixed-methodology and triangulation for investigating school system functioning. After this a detailed description of the quantitative and qualitative methods employed is presented alongside the analytical and ethical considerations considered. SHRN will be used as a case study to map the context of school engagement with, and for, wider learning from a new research network. It is described in detail below.

4.1.1 The School Health Research Network (SHRN)

SHRN was established in 2014, via an initial MRC grant, and maintained via Health and Care Research Wales (HACRW) funding. SHRN is based at the Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement (DECIPHer) within Cardiff University and provides an infrastructure for health research in Welsh schools. SHRN currently has a membership of 115 secondary schools (53% of secondary schools in Wales), and aims to have recruited all secondary schools in Wales by 2017 although, at the time of data collection for this thesis, the total number of schools in the network was 69. Consistent with a complex systems perspective, SHRN lays the groundwork for future intervention research through the development of a data infrastructure. This information is then used to assess health related needs, and current practices, within individual schools and Wales as a whole. Hence, it aims to support contextually tailored needs assessment and action planning at multiple levels of schools and their broader systems.

As members of SHRN, schools conduct a school-level environment questionnaire and a survey of health behaviours with their students and receive a tailored feedback report every two years, based on these data. The feedback report includes individualised school-level data on the following topics; food and fitness, substance

use and emotional wellbeing. These data are presented in bar charts where data are broken down by gender and year group and compared to a reference point of the national average. See Figure 3 for an example bar chart from a mock feedback report.

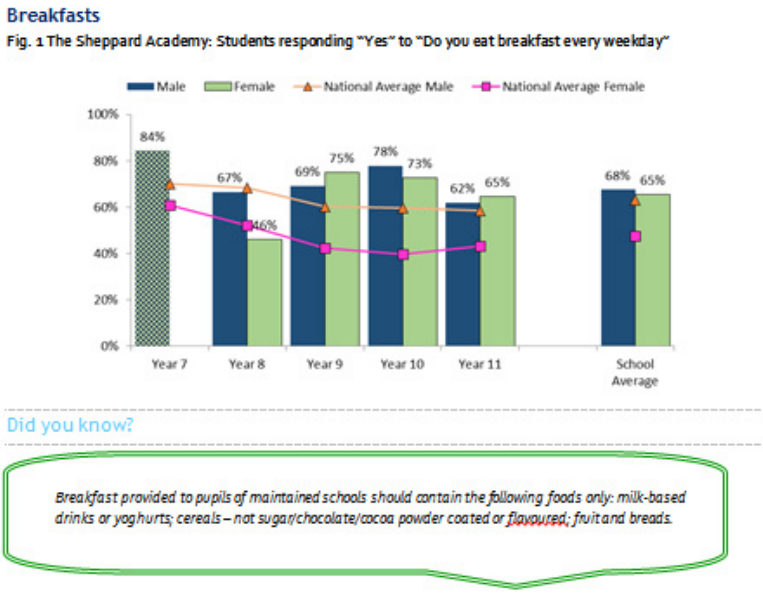


Figure 3 Example bar chart from a mock School Health Research Network feedback report

Provision of tailored feedback on absolute and relative school educational performance has been studied within the school improvement literature as a mechanism for promoting school effectiveness (Verhaeghe, Vanhoof, Valcke & Van Petegem, 2010). However, passively providing schools with feedback is usually not enough to substantially influence the functioning of these systems; schools often pay limited attention to feedback, or attempt to engage with it but lack the statistical expertise to confidently interpret feedback reports, or may get stuck in the transition from interpretation to active change (Vanhoof, Verhaeghe, Van Petegem & Valcke, 2012). This is due, in part, to a lack of time, resource or support to identify and implement appropriate solutions (Schildkamp & Kuiper, 2010). Thus, while SHRN

represents a starting point for a conversation about change, changing system functioning will likely require deeper engagement with school systems.

Indeed, the original grant application proposed a model which went beyond this passive model of providing data, with the intention of setting up action group models to engage with schools and use the individualised feedback to produce action plans for school health. However, only the first stage of this application, which encompassed the survey and provision of individualised data, was funded. In 2015, additional funding was also obtained via an Economic and Social Research Council grant which provided resource for seminar events to engage schools and other stakeholders in the network. These events aimed to enhance collaboration between schools, Healthy School Coordinators and academics, and contributed to ongoing work towards the development of a more engaged model for working with SHRN feedback data. This thesis aimed in part to contribute to the process of enhancing this model, through understanding schools' initial responses to, and engagement with, the network. Data collection for this thesis began 9 months after the network's inception and 3 months after the first round of feedback reports were delivered to schools. Data were collected over a period of 21 months.

4.2 Aims and research questions

This thesis applies a complex systems perspective to understanding variability between school contexts. It explores how school systems function in terms of health and considers what implications this may have for attempting to engage with school systems to optimise engagement with research networks, such as SHRN. Therefore, the overall aim of this research project is to explore the variance in health improvement processes and level of engagement with SHRN within different school contexts through conceiving schools as CASs.

The two main research questions that will be addressed are as follows:

1. How are efforts to engage schools in a discussion about health improvement impeded or facilitated by system characteristics?

2. How do school structures affect the embedding of health and wellbeing into complex school systems?

The first main research question will be supported through addressing the following three sub-questions:

a) How do system starting points and characteristics give rise to variability in initial responses to efforts to engage schools in a discussion about health improvement?

b) To what extent, and in what ways, do school stakeholders perceive a collaborative research network to offer potential for reorienting school systems towards health and wellbeing?

c) How does the position of schools within broader systems, and in relation to external systems, impact their functioning and responses to a collaborative research network?

The second main research question will be supported through addressing the following three sub-questions:

d) To what extent is health and wellbeing embedded into social networks of the school system and how do interactions, internal and external to the school, facilitate the implementation of health improvement activity in schools and the development of schools as healthy systems?

e) How are the structure of school health-related social networks and the position of key actors within these networks associated with engagement with a collaborative research network and the orientation of school systems toward health?

f) How does the consistency of health improvement actions with the Health Promoting Schools framework vary between schools with differing network structures and differing levels of engagement with a collaborative research network?

4.3 Mixed methodology and a critical realist paradigm

There is a long history of dispute between methodological purists on both sides of the debate who believe in the use of purely quantitative or qualitative research (Johnson & Onwuegbuzie, 2004). This has been referred to as the 'paradigm war' and stems from researchers conflating ontology and epistemology with methods (Howe, 1988; Johnson & Onwuegbuzie, 2004). Quantitative purists come from a positivist paradigm and believe that social research should be objective and able to make generalisations that are time and context-free. Qualitative purists, who come from an interpretivist paradigm, oppose this view and believe that time and context-free generalisations are not desirable or possible (Johnson & Onwuegbuzie, 2004) and place greater value on understanding and social construction of the world (McEvoy & Richards, 2006). Traditionally the incompatibility thesis opposes the mixing of methods, stating that quantitative and qualitative methods are incompatible on an epistemological level (Howe, 1988). This tradition had repercussions for young researchers in the past who may have felt pressurised to commit to one side of the debate. However, these misconceptions are being slowly overcome and it is now widely accepted that both quantitative and qualitative methods have advantages and limitations (Denzin, 2010).

Much emphasis has been placed on the differences between quantitative and qualitative research. These include the epistemological and ontological principles attributed to them, methods employed and standards for evaluating the credibility of research findings. Despite the existence of differences, approaches which differ theoretically can be surprisingly similar methodologically (Haggis, 2008). For example, quantitative and qualitative research has many similarities, such as the use of empirical observations and measures to ensure the validity or trustworthiness of the research (Johnson & Onwuegbuzie, 2004). Thus, it has been argued that it is possible to take a pluralist approach and combine these methods effectively using a

pragmatic or anti-conflationist method. A pragmatic method involves making practical decisions to utilise the optimal methods to answer each individual research question, regardless of whether this involves quantitative or qualitative practice (Johnson & Onwuegbuzie, 2004). Anti-conflationists further argue that quantitative and qualitative methodologies should not be dichotomised, but argue that only when a common epistemological and ontological standpoint, such as critical realism, exists, is it befitting to mix methods (McEvoy & Richards, 2006).

Further to this, Haggis (2008) argues that CAS thinking can provide an ontology to accommodate both approaches and combine them in a meaningful way as emergence and unpredictability are defining characteristics of a CAS. Thus, quantitative methods enable us to test pre-hypothesised patterns of behaviour, but qualitative methods are required to obtain an understanding of unpredictable patterns of system behaviour and emergent outcomes (Hawe et al., 2004a; Johnson & Onwuegbuzie, 2004). Outcomes should be explored at multiple levels of a complex system, using a variety of appropriate methods in order to capture emergent properties, rather than individual components of an intervention (Shiell et al., 2008). This could include capturing the perspectives of different groups, such as students, staff and parents and capturing everyday individual and social processes and characteristics, as well as organisational and policy level characteristics of the system, such as school rules and government educational policies.

As highlighted in Chapter 3, researchers have argued that critical realism can be effectively combined with, and used to provide an explanation for, complexity, as they share a philosophical basis and sufficient similarities (Callaghan, 2008; Reed & Harvey, 1992; Wong, 2013). For example, both critical realism and CAS thinking uphold that knowledge is situated and fallible, and foreground the need to understand the contextual contingencies necessary for associations between actions and outcomes to occur (Tremblay & Richard, 2011). Therefore, this thesis will attempt to investigate school contexts using both of these perspectives in a complementary manner (Bhaskar, 1998). As long as this is conducted in a transparent manner, in employing a pluralism of perspectives a higher level of and more integral understanding may be achieved (Tremblay & Richard, 2011).

Critical realism incorporates both epistemology, or belief about what knowledge is and how it can be obtained through research and ontology, or belief about what reality is and how it can be understood (Bhaskar, 1978). It is important to explicitly state and apply your philosophy due to our natural tendency for tacit philosophy, whereby philosophical standpoints are subconsciously applied to, and have an effect on, research design, implementation and interpretation (Dobson, 2001). Understanding different philosophical positions and explicitly stating a philosophical standpoint will help to focus the researcher, improve their confidence to argue in favour of different research approaches and avoid inconsistencies in theory and practice (Dobson, 2001). It can also help to ensure that the research is coherent and plausible (Wong, 2013). This is particularly important when coming from a critical realist standpoint, which argues for a strong relationship between philosophy and methodology (Bhaskar, 1989).

The main tenets of positivism are that there is a distinct separation between the researcher and reality, with the collection of data allowing a direct window to a true measure of reality (Caldwell, 2003). Data collected using quantitative methods, such as surveys are often assumed to conform to such positivist assumptions (Caldwell, 2003). In contrast, social constructionism states that society is created through interaction between agents, thus rendering the researcher and reality as inseparable. It also posits that individuals' understanding of reality is contingent upon context (Burr, 2015). Moreover, it states that knowledge is subjective and individuals' actions are dependent upon their perceptions of society (Burr, 2015). This paradigm is typically associated with qualitative methods.

Critical Realism states that there is a three-level ontological stratification that exists of the real, the actual and the empirical. The 'real' comprises of an open system where all possible mechanisms reside, the 'actual' consists of what actually occurs and thus excludes latent mechanisms, whilst the 'empirical' consists of what knowledge can be acquired through observation, and is only a subset of the real and the actual. Bhaskar (1978) theorises that not all of the actual can be measured and acquired as knowledge. Critical realism also purports that there exists two realities;

reality and our interpretations of reality. In other words, there is a reality independent of our thinking, which may not be possible to measure. However, while our research methods enable us to make inferences about real mechanisms and actual events, they do not provide a transparent window into this reality. Critical realism recognises the importance of meaning, whilst also emphasising the value of quantitative analysis in social research (Dobson, 2001) and stresses the mechanics of explanation, whereby outcomes are explained by mechanisms in different contexts and should be investigated using both quantitative and qualitative methodology (Pawson & Tilley, 1997).

Pawson & Tilley (1997) suggest that outcome=mechanism + context, whereby a mechanism is not merely a variable, but a process by which changes are produced. This is not solely context dependent in the sense that outcomes vary within different contexts. It suggests a process whereby the context interacts with the causal mechanisms to produce outcomes (Maxwell, 2004). Thus, research should not rest at stating that outcomes may have been affected by context, but should actively seek to research the process by which context interacts with mechanisms to produce outcomes (Maxwell, 2004). That is, what are the contextual contingencies necessary for mechanisms to be activated or suppressed. Whilst laboratory science attempts to create a closed system and to control for context by eliminating extraneous variables, social systems are, by nature, open systems. Therefore, context and its interaction with intervention mechanisms becomes the primary object of inquiry in much social science. This highlights the need to employ a combination of qualitative and quantitative mechanisms to establish the explanation of the mechanisms of causality, as well as description (Maxwell, 2004). Critical realism bridges the gap between quantitative and qualitative paradigms, which have often been polarised within extreme paradigms of positivism and interpretivism.

Mixed methodology is becoming increasingly popular as there is no rational reason why a positivist cannot analyse text or an interpretivist use numbers; different questions are suited to different methods. It therefore follows that, where appropriate, these should be used in conjunction with each other to transcend the limitations of each method (Bryman, 2006a). Advantages to qualitative inquiry

include gaining an insight into the process and of the perspectives of participants in a formative manner. It also has the advantage of flexibility over and above quantitative methods. This ability to follow-up emerging topics that arise during data collection allows for the discovery of emergent phenomena, which are characterised by unpredictability. In depth, rich and full data can be obtained, with a relatively small sample size through methods such as interviews, document analysis and observations. Moreover, complexities can be investigated in depth (Gillham, 2000). Whilst qualitative investigations have often been criticised for their lack of a representative sample, this is often not the aim of such research, with it instead aiming to explore a diverse range of perspectives.

Whilst quantitative methods, such as surveys, are useful for obtaining representative information from a large sample, quantitative methodology has often been criticised for its lack of in-depth inquiry. Johnson & Onwuegbuzie (2004) purported that research using mixed methodology is often of a higher quality than mono-method research. The limitations of each method discussed above may be offset by the combination of data sources. Triangulation is important as, by observing the same phenomena through a variety of methodologies, each with their own limitations and sources of error, it may be possible to achieve a more complete picture of reality. This thesis used a convergent parallel mixed methods design (Creswell & Plano Clark, 2011), which involved collecting and analysing qualitative and quantitative data separately but concurrently. During interpretation the findings from both methods were combined (Bryman, 2006b; Creswell & Plano Clark, 2011). This likely helped to increase validity, elaborate on the findings, offset methodological weaknesses and ensure that the results from both methods agree (Creswell & Plano Clark, 2011).

4.4 Methods used in this thesis

4.4.1 Study design

As described above, this thesis employed a convergent parallel mixed methodology and a critical realist ontology and epistemology to bridge the gap between qualitative and quantitative paradigms. Research methods consisted of a survey of all SHRN schools (N=69) to obtain an overview of school system functioning and engagement

with the network. Four in depth school case studies were recruited in South Wales to investigate school system functioning in more depth and to elaborate on the survey findings. Within each case study, ego social network analysis was conducted with Wellbeing Leads alongside semi-structured interviews with staff, parents, students, a Healthy Schools Coordinator and the SHRN Manager. These interviews served to contextualise and elaborate upon the social network analysis and survey results. Data collection was conducted between September 2014 and June 2016, in the months immediately after the inception of SHRN. Below, these methods will be outlined in more detail.

4.4.2 A survey to assess school engagement with a collaborative research network

A survey was conducted, which in combination with social network data described below, was used to answer research questions 'A' and 'B'. This served as an initial scoping study to analyse existing practice within school systems and their initial level of engagement with the SHRN health feedback reports to provide context for the case study findings. Whilst quantitative methods, such as surveys, are useful for obtaining representative information from a large sample, they have been criticised for measurement error and lacking in depth (Rossi, Wright & Anderson, 2013). Comparability between paper-based and online survey methods has been widely contested, with some studies demonstrating equivalent results (Weigold, Weigold & Russell, 2013) and others observing differences in aspects such as response rates and scale score responses (Shih & Fan, 2008).

Participants, sampling, recruitment and consent

All schools who were members of SHRN at the time of data collection were invited to participate in a survey, offered in both an online and paper format and in Welsh and English language. For the online survey an invitation email was sent to the Head Teacher and Wellbeing Lead for each school in September 2014. Three reminder emails were sent at monthly intervals. The email stated that it would be preferable for the survey to be completed by the Wellbeing Lead or a member of the SMT. Paper surveys were collected at SHRN events in June 2015 for schools who had not responded to the original email request. Data were input into SPSS, and descriptive statistics calculated.

Information traditionally provided in an information sheet was contained on the first page of the paper survey and appeared on the screen prior to the online survey commencing. Written consent was obtained for the paper survey, whilst individuals participating in the online survey were required to click a button to confirm that they had read the information provided and they were happy to participate, prior to the survey commencing. Three case study schools completed the online survey in 2014. The fourth case study school, which was not a member of SHRN during the initial round of surveys and health reports, later joined the network and was invited to complete the online survey in June 2016 in relation to the second round of SHRN surveys and reports.

Survey measures

Online and paper versions of the survey were created and were informed by CAS thinking (Hawe et al., 2009b), Strong Structuration Theory (Greenhalgh & Stones, 2010; Stones, 2005) and a knowledge exchange tool which was developed to measure knowledge exchange regarding an innovation (Skinner, 2007). These questions were piloted to obtain feedback regarding content and structure from individual members of staff, who worked in schools that were not eligible to participate in SHRN, and adapted accordingly.

An overview of the items within each section of the survey is provided below, whilst the full list of survey questions can be viewed in Appendix C. The first items asked the respondents' job role and the role of the individual responsible for interpreting the feedback report. Other school characteristics (school size, deprivation and language medium) were obtained from publicly available online information. Items explored whether respondents had received and read their report, perceived it to be a potentially useful planning tool for health improvement and perceived that their school would be likely to suffer negative consequences as a result of receiving it. The level of distribution and actual and planned discussion of the feedback report results were measured via separate items for each stakeholder group; colleagues, students, parents, other schools, outside agencies (such as charities and services provided by Local Authorities) and school governors. Other survey items inquired

whether respondents had developed new ideas for health improvement in the school, perceived a need for more support to take action and the likelihood of certain outcomes being achieved as a result of receiving the feedback report.

Analysis

Descriptive statistics were calculated to provide an overview of the perceptions of the SHRN health reports throughout schools in Wales, assignment of responsibility for interpretation of the SHRN health reports and the perceived importance of health within the school[1]. Items were summed to form composite scores for the questions relating to actual and planned distribution and discussion of the SHRN health reports across different stakeholder groups. In addition to this overview, descriptive statistics were calculated separately for each of the four case study schools.

4.4.3 In-depth exploratory Case Studies

Within this thesis a multiple case design was utilised. Four exploratory case studies were undertaken to enhance understanding of the embeddedness of health improvement activity within complex adaptive school systems and how this varies by context. They aimed to elaborate upon, and were facilitated by, the contextual overview provided by the survey findings. An exploratory case study design was utilised as this has been identified as a flexible and effective method for building knowledge about a phenomenon on which limited research has been conducted (Yin, 2003). Cases were bounded by social groups with direct interactions with the school (e.g. students, staff, parents and outside agencies). When aiming to answer research questions using a case study, it is likely that multiple data sources will be required to address all aspects of the research question effectively and to produce a complete picture (Gillham, 2000), resulting in an evidence chain (Yin, 2003). A case study can be classed as a mechanism-based methodology, which could be used to understand interactions within systems such as schools (Maroulis et al., 2010).

[1] *Oakwood School was not a member of the School Health Research Network at the time of the initial data collection, so their survey response was collected in June 2016 and is not incorporated into the averages for the 2014-2015 school year.*

Data were collected at regular intervals in order to capture the complex interactions between system components and to build a trusting relationship with each school (Kremser, 2011). Within each case study ego social network analysis was conducted with the Wellbeing Lead to map the wellbeing structure in the school. Semi-structured qualitative interviews were conducted with the Wellbeing Lead and between three and four other members of staff or outside agencies, sampled purposively to represent varying degrees of involvement in school health improvement. Semi-structured interviews were also conducted with between one and four parents and between three and four pairs of students within each case study school. The methods employed within each case study will be elaborated upon below.

Participants, sampling, recruitment and consent

Purposive sampling using replication logic was used to select four schools, each within different localities in South Wales. These schools were selected to represent differing geographical locations, sizes and socioeconomic status (SES) (Yin, 2003). Schools were approached via a telephone call, repeated on a weekly basis until the relevant person was reached, or a definitive answer was provided regarding participation. Out of the eight schools contacted by telephone, two agreed to participate. A group email invitation was then sent out to all SHRN schools. This was due to the slow and laborious process of attempting to contact and recruit schools on an individual basis, putting the study at risk of falling behind schedule. Three schools replied to this email within two hours to express an interest in participating. The purposive sampling criteria were then applied to select the school that was sufficiently different to the existing case studies. The fourth case study school expressed an interest in participating at a later date after giving a presentation for SHRN and, again, was deemed to be sufficiently different to the existing case studies according to the purposive sampling criteria. Written informed consent was obtained from the Head Teacher in each case study school prior to commencing data collection.

Description of case study schools

Pseudonyms were used throughout this thesis to protect the anonymity of participating case study schools. Case study schools varied according to a number of

factors, including size, level of deprivation and characteristics of the Wellbeing Lead. To contextualise case study data, background information on each school was derived from routine data sources and from a School Environment Questionnaire, collected by the SHRN team in early 2016. These school environment data were collected to analyse the context of schools within SHRN between March and May 2016. Out of 115 member schools, a response was received from 100 schools, a response rate of 87%.

Indicators of the embeddedness of health improvement and relative educational performance within case study schools, created by the SHRN team were used. The indicator of embeddedness of health improvement related to the three topics within the HPS Scheme (World Health Organization, 1986): curriculum, environment (measured by number of policies related to health) and parental involvement. Firstly, schools indicated to which year groups, and in which subjects, the following topics were taught; healthy eating, physical activity, tobacco education, drug education, alcohol education, mental health and wellbeing and sex and relationships education. Sum scores for each individual topic were created and subjected to factor analysis; all health topics, apart from mental health, loaded onto one factor. Therefore, mental health in the curriculum was taken forward as its own variable whilst the other health topics were combined to generate a physical health in the curriculum variable. These scores ranged from 0-10 for mental health and 11-75 for physical health in the curriculum.

Next schools were asked whether they had a written policy for smoking, drugs, alcohol, healthy eating, mental health, violence against women and suicide prevention, with a score generated for each school indicating the number of health topic areas covered by a written policy (ranging from 0-7). Finally, three parental involvement in decision-making questions, the estimated proportion of parents involved in health improvement, the number of areas in which parents were involved and the number of mechanisms (such as PTA groups) through which parents were involved, were combined into a single variable as factor analysis showing that these three questions load onto a single factor. Individual subcomponents were scaled to represent scores from 0-1 and then combined to create a composite score of overall

embeddedness of health in the school. This resulted in possible scores of 0 (lowest possible embeddedness) to 3 (highest possible).

In addition, for all SHRN schools, data on Free School Meal entitlement and educational performance were obtained from mylocalschool.org. School level educational attainment data consisted of an average of attainment at Key Stage 3 (age 13/14 years) and Key Stage 4 (age 15/16 years) in each school. Regression residuals from a model predicting educational performance from FSM entitlement, were calculated for each case study school to demonstrate the extent to which the educational attainment of their students fell below, or above, the expected level based on their FSM intake. Whilst each of the four case study schools had above average educational outcomes for their level of deprivation, there was also wide variation between them. See Table 3 for an overview of these figures.

Greenfield School was a small secondary school with <900 students, located in an affluent rural area, with a Welsh Index of Multiple Deprivation (WIMD) ranking in the highest 10% for the health category, where a high score represents the lowest level of deprivation. The role of Wellbeing Lead was allocated to a female PE Teacher aged 26-35 years, who was not a member of the SMT. The school had achieved the National Quality Award on the Healthy Schools Scheme, which is the highest accolade available on the programme. Greenfield School was ranked third out of the four case studies in terms of overall embeddedness of health in the school, with a score of 1.66 out of 3. Moreover, Greenfield was ranked second out of the four case study schools in terms of relative educational attainment, which was shown to be 10.6% higher than expected, based on its FSM intake.

Woodlands School was a large secondary school located in the Welsh Valleys with >1200 students, with a WIMD score near the median for the health category. The role of Wellbeing Lead had been newly allocated to a female Assistant Head Teacher aged 46-55 years, who had been at the school for 28 years in a teaching capacity and was recently promoted into the SMT. The school was in the first stage of the Healthy Schools Scheme. Woodlands School was ranked second out of the four case studies in terms of overall embeddedness of health in the school, with a score of 1.83 out of 3. However, Woodlands was ranked fourth out of the four case study schools in

terms of relative educational attainment, which was shown to be 0.5% higher than expected, based on its FSM intake.

Highbridge School was a small secondary school with an enrollment of <700 students and was located in a highly deprived urban area, with a WIMD score in the lowest 10% for the health category. The role of Wellbeing Lead was allocated to a female Deputy Head aged 46-55 years, who had been at the school for 30 years. The school had achieved/was working towards the National Quality Award of the Healthy Schools Scheme. Highbridge School was ranked first out of the four case studies in terms of overall embeddedness of health in the school, with a score of 2.34 out of 3. Not only was this the highest score of the four case studies, it was also the highest score out of all schools in SHRN. Highbridge School was also ranked first out of the four case study schools in terms of relative educational attainment, which was shown to be 19.1% higher than expected, based on its FSM intake.

Oakwood School was a large school of >1000 students and was located in a mixed urban area with a WIMD score in the top 10% for the health category. The role of Wellbeing Lead was allocated to a female Deputy Head aged 46-55 years, who had been at the school for 25 years. The school was in the third stage of the Healthy Schools Scheme. Oakwood School was ranked fourth out of the four case studies in terms of overall embeddedness of health in the school, with a score of 1.34 out of 3. Moreover, Oakwood was ranked third out of the four case study schools in terms of relative educational attainment, which was shown to be 6.2% higher than expected, based on its FSM intake. Table 3 summarises case study school characteristics.

Table 3 Characteristics of case study schools

School	No. of students	WIMD score (low score = highest deprivation)	Geographic location	Stage of Health Promoting Schools Scheme	Characteristics of Wellbeing Lead	Relative educational performance (% above average for schools of similar socioeconomic status)	Eml heal imp the s 3)
Greenfield	<900	Highest 10% (affluent)	Rural	National Quality Award (highest accolade)	Female PE Teacher, aged 26-35 years	10.6%	1.66
Woodlands	>1200	Around median	Welsh Valleys	Stage 1	Female Assistant Head Teacher, aged 46-55 years	0.5%	1.83
Highbridge	<700	Lowest 10% (deprived)	Urban	National Quality Award	Female Deputy Head, aged 46-55 years	19.1%	2.43
Oakwood	>1000	Highest 10% (affluent)	Urban	Stage 3	Female Deputy Head, aged 46-55 years	6.2%	1.34

4.4.4 Social network analysis

Social network analysis was conducted within the four case study schools. Social network analysis represents a useful method for assessing the context and structure of a CAS both prior to and during intervention implementation (Hawe et al., 2009b). Social networks are webs of social ties that link people together. Most commonly, these are one-to-one links, conceptualised in terms of interaction (i.e., direct communication), affective ties (e.g., liking/disliking), role relationships (e.g., kinship), or various ideas of social exchange (e.g., social support) (Van der Poel, 1993). Bipartite network ties, or ties between different types of actor (e.g. group to individual), can also be used to indicate individual-to-group ties, thereby representing individuals' co-participation across groups. Social network analysis is a diverse set of quantitative and qualitative methods for analysing network data, as well as outcomes associated with these structures (e.g., (Robins, 2015; Wasserman & Faust, 1994)). Within complex systems such as schools, interpersonal interactions and relationships are shaped, not only by individual characteristics of agents (e.g. preferences, choices, and motivations), but also by characteristics and institutional practices of the school. This is in addition to various common normative tendencies (i.e. self-organising processes), as well as a sheer random element within relationship formation (Robins, Pattison, Kalish & Lusher, 2007).

Hawe (2009a) also outlines that the agency of networks are valued for the implementation of interventions from a complexity perspective. Social networks are shaped by both individual and school characteristics, reflecting the multilevel nature of the system (Moolenaar, 2012). Networks also differ across schools and often occur in subgroups that may deviate from the formal hierarchies within the school (Moolenaar, 2012). Therefore, gaining an understanding of these would help to increase the understanding of the complex system of each case study school and how this facilitates or inhibits the planning and implementation of health promotion activities and the orientation of school systems towards health.

Whole network analysis requires the system to be bounded and requires data from as close to 100% of actors, or a complete network as possible (Robins, 2015). It can be utilised within CASs, alongside the caveats that the chosen boundary is somewhat

artificial. However, this thesis is explicitly focused upon interactions within, as well as outside, the complex, unbounded school system. Thus, ego network analysis was employed. This also allowed for the nature of interactions to be investigated in more depth, as network analysis was incorporated into the semi-structured interviews (Hawe & Ghali, 2008). Although sacrificing some understanding of the structural characteristics of school systems, ego-network analysis with key individuals can provide an understanding of health-related networks within the school and simultaneously capture interactions with external systems (Moolenaar, 2012).

Social network analysis was used to measure various network concepts which represent the volume and nature of interactions among agents within a social system, including the level of brokerage and the presence of cliques. Betweenness centrality is a measure of brokerage, measuring whether alters sit on the shortest path between other nodes (Borgatti, 2005; Robins, 2015). Brokerage can be analysed in various ways. In this thesis, brokerage positions within the school and between the school staff and outside agencies are of particular interest. In the latter sense, brokerage can be seen in terms of individuals who liaise between non-overlapping subgroupings, such as between the SMT and an outside charity (Gould & Roberto, 1989), to fill structural holes between cliques to enable access to information and resources. A clique is a subset of three or more alters who are all connected to one another, where no other alter is connected to all of the clique members (Wasserman & Faust, 1994). Cliques may indicate the presence of a small shared group setting in which more than two people interact.

Participants, sampling, recruitment and consent

Ego network analysis was conducted with the Wellbeing Lead within each case study school. Ego network analysis, whereby the perceptions of a focal participant of their immediate social network and embeddedness in their social environment is measured (Robins, 2015), was employed within case studies. This was utilised to investigate to what extent each of the Wellbeing Leads were central to information exchange and health promotion planning within the school and how widely their networks reached. Written informed consent was obtained prior to commencing the interviews, during which the social network analysis was conducted.

Data collection procedure

Ego network data were collected via a physical visualisation method (Hogan, Carrasco & Wellman, 2007). Interviewees ("egos") underwent name-generation via free recall (Hogan et al., 2007). Participants were asked to list names and job titles of all individuals or groups ("alters") with whom they routinely interacted regarding health improvement, within and outside of the immediate school setting. The ego was then asked to use different coloured post-it notes according to stakeholder group (i.e. SMT, teaching staff, non-teaching staff, parents/students and individuals/organisations external to the school). Egos then assigned the following attributes to alters by marking numbers onto each post-it note according to a key; age group, gender, frequency of interaction and length of service. After this, they were asked to draw lines between alters to represent whether these alters interacted with each other in relation to health. They were also asked to indicate their perceived importance of each interaction for school health by adding 0-3 stickers next to each post-it note. Throughout this process, egos were encouraged to talk through and elaborate on the interactions identified within their ego network. A photo was then taken of the network map for use in analysis. The technique was piloted with three academics in August 2014, where questions were adapted to focus upon routine interactions regarding collaboration on research grant proposals. The technique and questions were also piloted with one Health and Wellbeing Lead in a school in September 2014.

Analysis

Egonet was used to conduct all statistical analyses and to create two diagrammatic representations (net-maps) of each network, one of the complete network and one which excluded those alters classed as 'outside agencies'. Betweenness centrality (brokerage) scores and number of cliques were calculated for each ego network. Net-maps were interpreted prior to the calculation of the composite score for embeddedness of health improvement in the school.

4.4.5 Semi-structured interviews

Whilst social network analysis served to map the wellbeing structure within each school, semi-structured interviews aimed to contextualise this data further and investigate the reasons behind these interactions and structures, as well as their perceived impact. Hawe & Ghali (2008) emphasise the need to understand pre-existing relationships in order to understand how health practices currently diffuse through school settings. They propose that an assessment of the school environment could include social network methods alongside qualitative methods, such as interviews and focus groups, prior to intervening (Hawe & Ghali, 2008).

Semi-structured interviews are particularly advantageous when research questions are narrow, but there is an inductive element to the research, whereby a researcher is looking to explore unchartered territory, as emergent themes can be followed-up and elaborated upon and the 'how' and 'why' can be explored (Saks & Allsop, 2012). Alongside this exploration of participants' realities, comparisons can be made between interviews. Within this thesis, semi-structured interviews were conducted due to the complex nature of the topic and the need to create a pre-determined, non-prescriptive and non-exhaustive topic guide, whilst having the freedom to explore emerging topics of interest. Semi-structured interview schedules were developed using the framework of CAS thinking (Hawe et al., 2009b) and the theories of Strong Structuration (Greenhalgh & Stones, 2010; Stones, 2005) and Health Promoting Schools based on human functioning (Markham & Aveyard, 2003). These guides differed according to stakeholder group and were continually adjusted throughout the research process, according to ongoing analysis of interviews, throughout this iterative process.

4.4.6 Semi-structured interviews with school staff

Participants, sampling, recruitment and consent

Results of the Wellbeing Leads' ego social network analysis were utilised to sample key informants, at varying levels of proximity to the ego and involvement in health within the school, to participate in interviews. Participants included three to five members of staff or Healthy School Coordinators per school, including the Wellbeing Lead. Staff were purposively selected and recruited via a snowball sampling technique and approached by the Wellbeing Lead. The Network Manager

of SHRN also participated in an interview and was invited to participate via email. Written informed consent was obtained prior to commencing the interview. See Table 4 for an overview of participant characteristics

Table 4 Characteristics of staff interviewees within schools and the School Health Research Network (SHRN)

		Greenfield School	**Woodlands School**	**Highbridge School**	**Oakwood School**	**SHRN**
Wellbeing Lead	***Role***	PE Teacher	Assistant Head Teacher	Deputy Head Teacher	Deputy Head Teacher	Network Manager
	Age group	26-35	46-55	46-55	46-55	56-65
	Gender	Female	Female	Female	Female	Female
Interviewee 2	***Role***	Assistant Head for PSE	Food Technology Teacher	Wellbeing Manager	School Nurse	
	Age group	36-45	26-35	36-45	46-55	
	Gender	Male	Female	Female	Female	
Interviewee 3	***Role***	Healthy Schools Coordinator	PE Teacher	Behaviour Support Officer	Head of PSE	
	Age group	26-35	26-35	36-45	36-45	
	Gender	Female	Female	Female	Female	
Interviewee 4	***Role***	Food Technology Teacher	Head of Science and Student Voice	Teaching Assistant	Senior Learning Support Officer	
	Age group	36-45	26-35	36-45	46-55	
	Gender	Female	Female	Female	Female	
Interviewee 5	***Role***	Student Support Manager				
	Age group	46-55				
	Gender	Female				

Data collection procedures

Face to face, semi-structured staff interviews took place between October 2014 and April 2015. Interview questions were piloted with two individuals who work with schools, or work in schools that did not participate as a case study. Interview schedules were adapted throughout data collection in order to follow interesting leads from previous interviews and can be viewed in Appendix D. The interview schedule comprised of the following themes; school ethos, awareness of health improvement activities, importance of school and family for promoting health, collaboration between staff, students and parents, link between health and education, health structures, student voice, barriers and facilitators to student involvement, SHRN health reports and the HPS Scheme. Interviews lasted between 30 minutes to one hour and were recorded using a Dictaphone and then transcribed. Notes were also taken throughout the interviews to record observations about the setting, participants' attitudes and non-verbal communication.

4.4.7 Semi-structured paired interviews with students

Semi-structured interviews with students aimed to collect the views of students and compare and contrast these with staff perceptions. It is imperative that strategic positions of key players, the meaning that actors attribute to intervention events and the extent to which interventions are embedded within their organisational context are considered (Foster-Fishman et al., 2007). In a school setting, this would relate to teachers, students, governors and parents among others.

Individual versus paired interviews

Research with young people often involves a combination of individual interviews and focus groups. Previous research has shown that young people can communicate perceptions of meaningful worlds that they have created in an interview context (Miller & Glassner, 1997). Selecting the best technique is important due to the challenges in maintaining interest among participants. Moreover, some studies have found variance in responses using different techniques with the same participants (Michell & West, 1996). Individual interviews were found to be the most unpopular method among 10-14 year olds, with participants only consenting to this out of necessity, for example due to the absence of other participants (Highet, 2003). It was

also found that participants within individual interviews did not open up to the same extent compared to alternative methods, suggesting that having the option to interact with peers may elicit richer interview data (Highet, 2003).

In contrast, studies employing paired interviews with children and adolescents have found participants to feel comfortable with a self-selected friend, with conversation and debate arising between them (Mauthner, 1997). Michell & West (1996) also found groups of two or three self-selected friends to provide a natural setting, within which children were able to open up. This small group/paired setting may be advantageous over a larger focus group, whereby young people who are shy or have an opinion that they would not want to share beyond their friendship group, may be less vocal. A further advantage of paired interviews over large focus groups was the improved ability to accurately transcribe (Highet, 2003), compared to attempting to decipher who is talking within a large group (Michell & West, 1996). In the current study, the use of paired interviews was both an evidence-informed and pragmatic choice. It allowed the creation of a more informal setting, while also keeping demands on school staff in terms of recruitment and organisation to a minimum.

Participants, sampling, recruitment and consent

For each of the four case study schools, between six and eight students participated in three to four paired interviews. Key informants were purposively sampled. Teachers were asked to identify students from the upper school (Years 10 and 11) and lower school (Years 7, 8 and 9) within each case study school. It was requested that teachers identify students who were considered generally healthy and perceived to be involved in activities and decision-making as well as students who were considered relatively unhealthy and/or relatively disengaged from school life.

These individuals were invited to participate and were provided with a participant information sheet by their teacher. An opt-out consent process was utilised due to the social patterning of responsiveness observed when traditional opt-in consent is undertaken (Courser, Shamblen, Lavrakas, Collins & Ditterline, 2009). Parents of children under the age of 16 were sent an information sheet and opt-out consent form two weeks prior to data collection (Courser et al., 2009; Moore, Currie, Gilmore,

Holliday & Moore, 2012). This consent form was given to a school administrator to send out by post with a stamped, addressed envelope to ensure that parents received it and were able to return it, if necessary. If parents chose not to opt their child out of the research process, participants were provided with an information sheet and written informed assent was obtained prior to commencing the interview. It was emphasised that the children were not obliged to take part and were able to withdraw at any point during data collection. An overview of the characteristics of student interviewees is provided in Table 5.

Table 5 Characteristics of student interviewees

	Greenfield School	**Woodlands School**	**Highbridge School**	**Oakwood School**
Number of Students (N)	6	8	8	8
Year groups represented	7, 8, and 9	7, 8, 9, 10 and 11	8 and 9	7, 11 and 12
Male (N)	2	6	4	6
Female (N)	4	2	4	2
Ethnicity	All White British	7 White British, 1 White Polish	All White British	All White British

Data collection process

Face to face paired, semi-structured interviews were conducted with students between January and April 2015 to assess perceptions of health improvement activities and student involvement. The interview schedule (see Appendix E) was informed by the semi-structured interviews conducted with other stakeholders and consisted of the following themes; school ethos, importance of school and family for promoting health, collaboration between school and family, link between health and education, awareness of health improvement activities, student voice, barriers to student involvement and SHRN health reports. Interview questions were piloted with young people who were not participating in the case studies, but were members of

ALPHA, a young person's advisory board led by Cardiff University. Interview schedules were adapted throughout data collection to follow interesting leads from previous paired interviews. Interviews lasted around 20-45 minutes and were recorded using a Dictaphone and then transcribed. Notes were also taken throughout the interviews to record observations about the setting, participants' attitudes and non-verbal communication.

4.4.8 Semi-structured interviews with parents

Further to the student interviews, semi-structured interviews with parents aimed to compare and contrast parental perceptions with those of staff and students. It is important to consider the fact that CASs are unbounded, often interacting with many external systems and overarching supra-systems. Thus, this involves venturing outside the physical boundaries of a school (Chadderton & Torrance, 2011; Hetherington, 2013).

Telephone versus face to face interviews

Several differences have been identified between face to face and telephone interviews in terms of the responses elicited by interviewees. Irvine et al. (2013) demonstrated that formulation and completion of discussion was less common in telephone interviews. Telephone interviews were also generally shorter and interviewees were more likely to request clarification and check that their responses were adequate. (Sturges & Hanrahan, 2004) found that telephone interviews may hinder the development of rapport between researcher and interviewee, but that this may be counteracted through an increased sense of anonymity. Despite this, the study found similar results to have been elicited via both methods (Sturges & Hanrahan, 2004).

The choice to undertake some telephone interviews with parents was primarily a pragmatic one due to the well documented difficulty in recruiting this group (Mirick, 2014). Thus, although rapport may be compromised to an extent, the prospect of anonymity and the convenience of being able to participant in their home may play a positive role in recruitment.

Participants, sampling, recruitment and consent

Between one and four parents participated in interviews within each case study school. Parents were pragmatically sampled through opportunities presented by the Wellbeing Lead in the school. In Greenfield, Woodlands and Highbridge Schools, staff were unable to recruit parents for interviews. Instead, parents who were also members of staff at the school were recruited. In Oakwood School, the School Nurse was able to recruit a range of parents who she had liaised with, who were not members of staff at the school. Either verbal or written informed consent was obtained. Characteristics of parent interviewees are summarised in Table 6.

Table 6 Characteristics of parent interviewees

	Greenfield School	**Woodlands School**	**Highbridge School**	**Oakwood School**
Number of Parents (N)	1	4	3	3
Member of school staff (N)	1	4	3	0
Male (N)	0	0	0	0
Female (N)	1	4	3	3
Telephone (N)	0	0	0	3

Data collection procedure

Face to face or telephone interviews were conducted with parents, according to individual preference, to assess perceptions of the role that schools and families should play in health promotion and their involvement and influence over school health improvement activities. The interview schedule was informed by interviews with other stakeholders and included the following themes; school ethos, importance of school and family for promoting health, collaboration between school and family, link between education and health, awareness of health improvement activities, parents' perceptions of having a voice, barriers and facilitators to student involvement and SHRN health reports. The full interview schedule can be viewed in

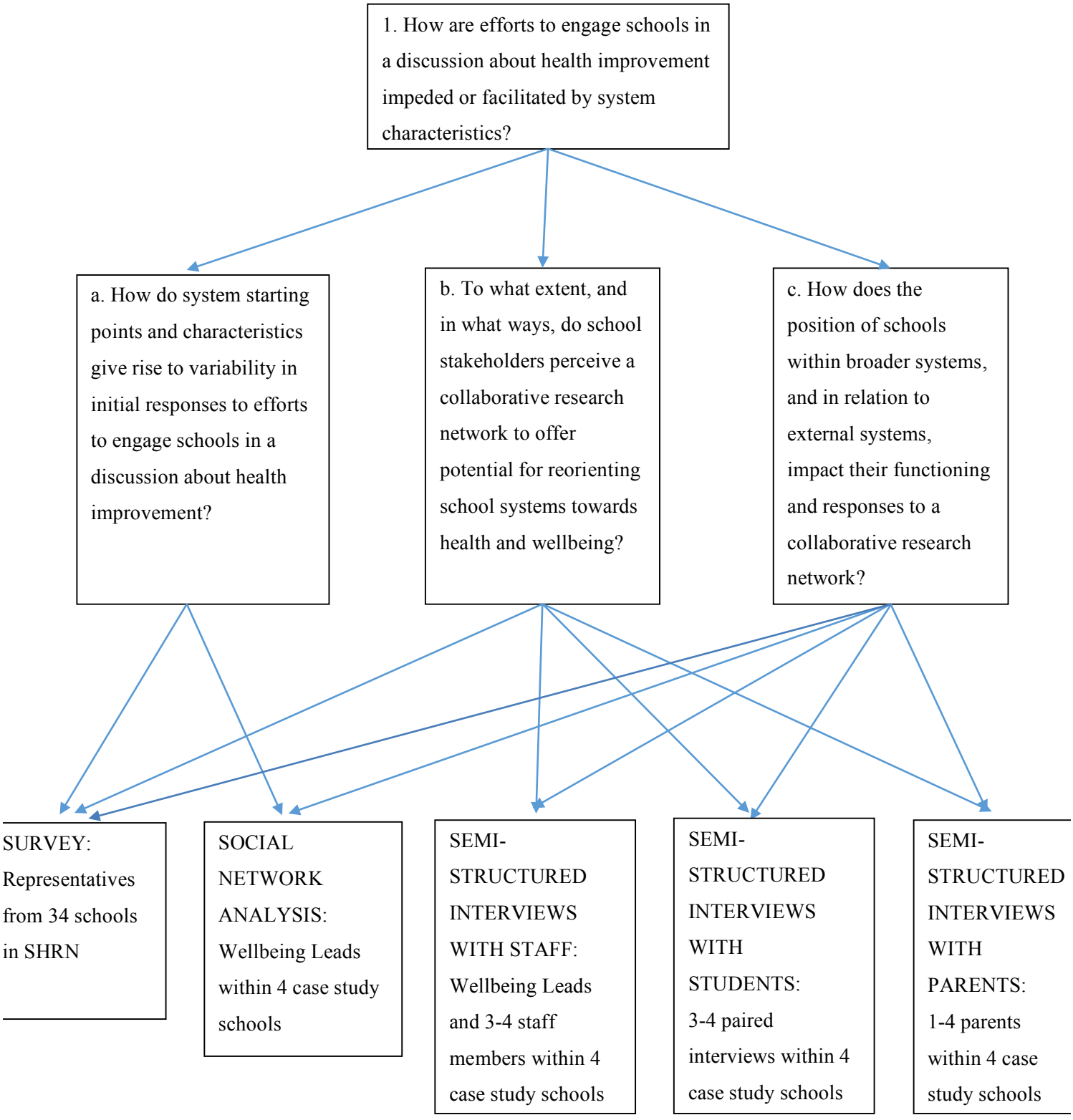
Appendix F. Interview questions were piloted with two individuals who worked with schools, or worked in schools that were not eligible to participate as case studies. Interview schedules were adapted throughout data collection to follow interesting leads from previous interviews, lasted around 20 -30 minutes and were audio recorded using a Dictaphone and then transcribed. Notes were also taken throughout the interviews to record observations about the setting, participants' attitudes and non-verbal communication. For telephone interviews, notes were taken to record attitudes, pauses and tone of voice.

4.4.9 Analysis of interview data

Seven out of 41 interviews were transcribed by the researcher, whilst the remaining interviews were transcribed by a professional who had signed a confidentiality agreement. Upon receiving the transcripts, the researcher listened to the audio tapes whilst correcting any mistakes made during transcription. Early notes on data analysis were also taken at this point. Coding was conducted using NVivo software. Interviews were analysed using thematic analysis (Braun & Clarke, 2006) with aspects of a Grounded Theory approach incorporated (Corbin & Strauss, 2014). Inductive open coding was used to develop an initial coding system before comparing and structuring the codes. This involved repeated reading of the transcripts in an active manner (Braun & Clarke, 2006). In line with grounded theory, a second scan of the interview transcripts was then undertaken, whilst actively suppressing any presuppositions about the data, in order to identify any other possible themes. All codes were then organised into overarching themes and sub-themes. Themes were then reviewed in terms of whether the data extracts fit into each coherent theme and whether the themes and sub-themes accurately represented the overall dataset. Alterations were made accordingly (Braun & Clarke, 2006), before naming and defining the themes. This was an iterative process, whereby pertinent codes were elaborated upon within future interviews. These data were also compared across case study schools, and across and within groups of stakeholders in each school, to develop a deeper understanding of how health and wellbeing contexts vary across different complex school systems.

4.5 Analysis Plan

The research methods described above each sought to answer specific research questions. Question ‘a’ was explored through the survey and social network analysis. Meanwhile, questions ‘b’ and ‘c’ were explored through the survey, and semi-structured interviews with staff, students and parents. Question ‘c’ was also explored through social network analysis. This is represented within Figure 4 below.



re 4 Diagrammatic representation of the link between main research question one, sub questions and methodology

Further to this, research questions ‘d’, ‘e’ and ‘f’ were explored using social network analysis and semi-structured interviews with staff, students and parents. This is represented within Figure 5 below.

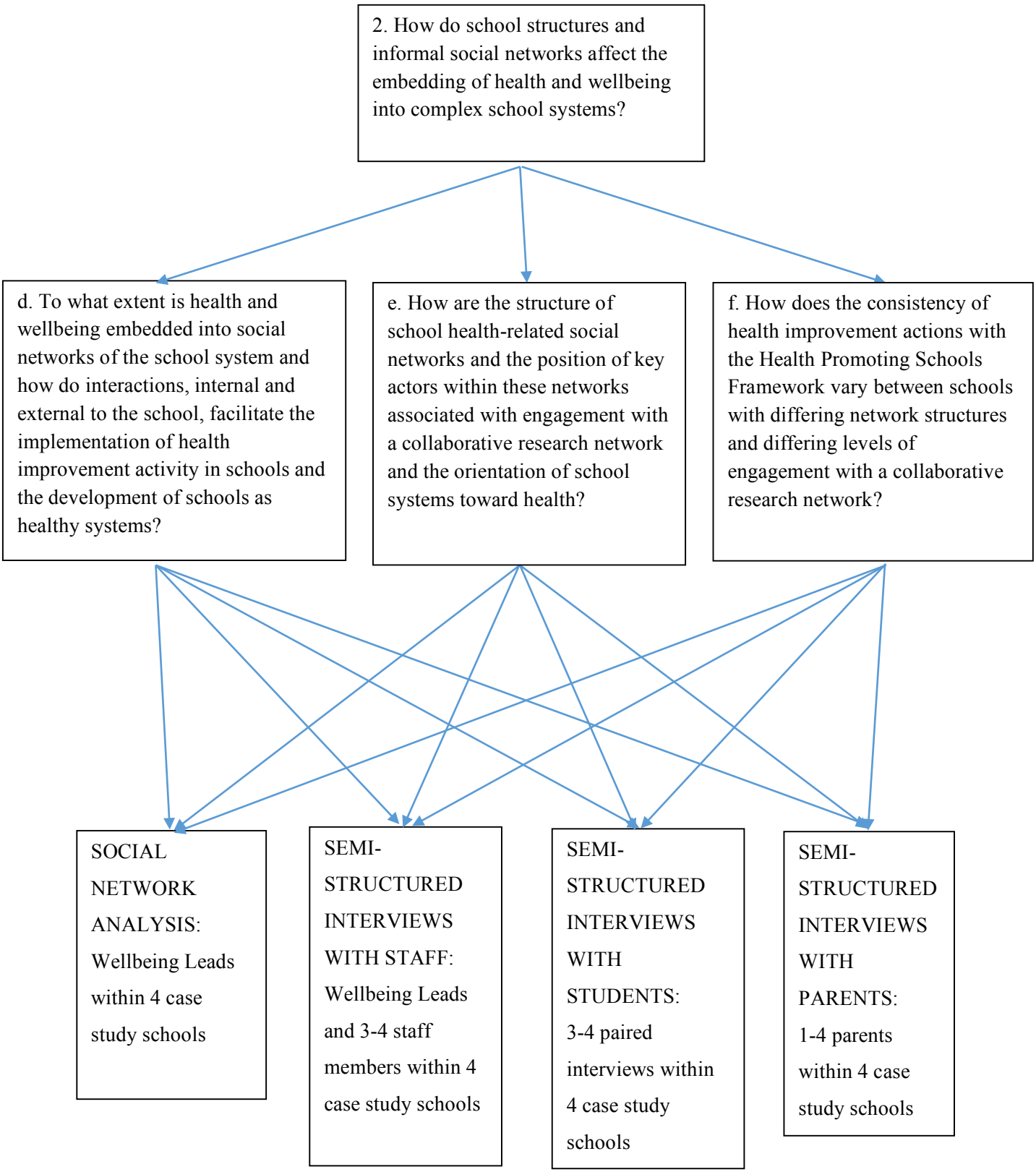


Figure 5 Diagrammatic representation of the link between main research question two, sub questions and methodology

4.6 Ethical considerations

This research has been conducted in line with the Medical Research Council's 'Good research practice: Principles and guidelines' document. Ethical approval was obtained by Cardiff University's School of Social Science Research Ethics Committee in May 2014 and a Disclosure and Barring Service (DBS) check was undertaken by the researcher in December 2013. Additional Research and Development approval was obtained from the National Health Service. This was required to conduct an interview with a Healthy School Coordinator who was employed by their Local Health Board, encompassed by the National Health Service.

Information sheets were sent to all participants, both individuals and organisations, to inform them of the purpose of and the procedures to be employed within the study. Their right to withdraw at any point before, during or after the duration of the study was also stated. All participants were informed that their data may be included within this thesis, as well as future academic publications or presentations. Moreover, all data was confidential and anonymised using pseudonyms for people and places. Data will be stored for five years in locked filing cabinets, whilst electronic data is password protected in line with the Data Protection Act (Great Britain, 1998). Participants were informed of these measures prior to participating.

Written informed consent was obtained for the interviews from all staff, the Healthy School Coordinator and the parents who were interviewed face to face. Those parents who were interviewed by telephone provided verbal informed consent. In the case of student participants, to attenuate response bias, opt-out consent was obtained. Schools were asked to send information sheets and opt-out consent forms to the parents of participating students, in order to maintain confidentiality. Parents were then provided a two-week window to opt their child out of participating. If no correspondence was received after two weeks, consent was assumed. Assent was also obtained from each child prior to commencing their interview.

Opt out consent is often preferred by researchers due to its ability to yield high and representative response rates through attenuating the inevitable social patterning which prevails when parents are required to sign and return a form (Courser et al.,

2009; Lacy et al., 2012). This, combined with a decreased burden on schools, is arguably a more ethical way of conducting research due to the improved quality of research findings, as parents from a lower socioeconomic background may be less likely to opt their child into research (Courser et al., 2009; Lacy et al., 2012). Moreover, children of a lower socioeconomic status have been shown to have a higher prevalence of engaging in unhealthy behaviours (Hanson & Chen, 2007). Thus, their representation within research is vital to ensure that their needs and perceptions are responded to (Lacy et al., 2012).

Although the risk of harm was low, there was a potential for participants to feel a minimal amount of discomfort talking about health, particularly in relation to emotional wellbeing. Moreover, there was a minimal risk of pressure to participate from colleagues, peers and/or teachers. This potential risk for harm was minimised through the use of informed consent, as outlined above. Moreover, the researcher travelled to interviews alone and therefore adhered to the Cardiff University 'Lone Working Policy' to minimise risk. The researcher travelled by car with a fully charged mobile telephone and a range of emergency contact numbers and was primed to leave the setting immediately if made to feel uncomfortable. As a further precaution, a responsible person/research supervisor was nominated and their consent gained prior to any face-to-face data collections. The responsible person was available during the data collections to act as a contact and was provided with all the information regarding the data collection (e.g. timeframe, setting, contact number, mode of travel). The responsible person was contacted both prior to and after each data collection.

4.7 Researcher position

Position of the researcher and awareness of its potential effect on the research undertaken is important in improving knowledge production through qualitative research (Stronach, Garratt, Pearce & Piper, 2007). Reflexivity can be defined as active acknowledgement of the effect of researcher position on the whole research process and outcomes as well as a continual critical self-evaluation aimed at mitigating this effect (Stronach et al., 2007). This self-evaluation of the lens through which a phenomenon is studied may help to achieve improved trustworthiness and

credibility (Alvesson & Skoldberg, 2000). Strategies for enhancing reflexivity include focusing on self-knowledge and sensitivity, seeking a balance between the personal and universal, understanding the role of the researcher in the creation of knowledge in terms of the impact of biases, beliefs, personal experiences and characteristics and maintaining transparent reporting of decisions and rationale (Berger, 2015).

Within this thesis, there were several pertinent issues to be cognisant of through reflexivity. For example, issues of reflexivity are particularly prominent within qualitative interviews as researcher position will impact the theoretical standpoint from which questions are formulated and answers are analysed. Reflexivity also affects what information is followed up (Holstein & Gubrium, 2004). Inevitable power dynamics arose within interviews with each group of stakeholders, for differing reasons. For example, students may have viewed the researcher as someone of authority who may inform their teachers of what has been said. Thus, there may have been a level of response bias elicited. The researcher remained aware of this throughout the research process and attempted to mitigate this issue through dressing casually, reinforcing the fact that interviews were confidential and building rapport. For example, many student interviews began by the researcher asking students to describe the values of their school. Moreover, the use of paired interviews was consciously employed to help create a more relaxed atmosphere. The same issue of power dynamics was prominent in parent interviews where the researcher reiterated the importance of confidentially and attempted to build rapport through remaining informal. Moreover, the option of telephone interviews may have facilitated relaxation among participants and also access to harder to reach populations, such as parents from a lower socioeconomic status.

The issue of social desirability may have been highest among staff when the researcher posed questions regarding SHRN. This was a project that three of the case study schools were involved in at the time of the interviews being conducted. Moreover, SHRN was led by the research centre in which the researcher was based. Therefore, staff may have felt obliged to offer a positive assessment or have been embarrassed if they had not heard of the network. The researcher attempted to

minimise this within the interviews through highlighting that, whilst working alongside the SHRN team, their work had a degree of separation from the project and critical comments would be welcomed in order to improve the extent to which SHRN meets schools' needs.

The researcher worked hard to ensure that interview schedules avoided a patronising stance and that all participants could relate to the questions (Berger, 2015). Interview schedules were piloted with similar groups of people, and interview schedules and technique were adjusted according to the feedback received, prior to commencing the study. For example, the researcher made use of ALPHA, a young people's advisory board based in the Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement (DECIPHer) in Cardiff in order to obtain detailed feedback on how to improve these factors.

The fact that the researcher was a 26-year-old female with no children may have impacted on staff's parents' and students' perceptions and levels of rapport attained. For example, having no children of their own may have limited the extent to which the researcher could empathise with parental perceptions. Whilst the same characteristic, plus the relatively young age of the researcher, may have facilitated the development of rapport with students. Moreover, being a young researcher with no direct experience of working within a school may have limited the level of rapport built with school staff. This would be especially true if staff perceived the researcher as someone who is attempting to make judgements of their professional practice. However, SHRN intentionally employed a Network Manager who is a former teacher and is known by and has built relationships with many schools in Wales. Thus, the Network Manager played an active role in introducing the researcher to potential case study schools in order to mitigate this.

The fact that the researcher was not a Welsh-Speaker and did not have a Welsh accent limited access to Welsh schools and may have hindered the development of rapport due to a possible perception of being an 'outsider'. This was mitigated through demonstrating knowledge of aspects of the Welsh school system, such as ESTYN (the Welsh School Inspectorate).

4.8 Overview of empirical chapters

4.8.1 Chapter 5: Understanding variance in response to, and engagement with, a collaborative research network

Reporting of the results begins with a chapter dedicated to the exploration of the health context in Welsh schools, within which the case study schools sit. As represented in Figure 4, it aims to answer research questions 'a', 'b' and 'c' through conducting a survey and semi-structured interviews with staff, students and parents. It both qualitatively and quantitatively explores the embeddedness of a minimal system disruption in the form of health feedback reports provided by a research network, SHRN. This was explored both within Welsh Schools as a whole through the survey and individually within each case study school through the survey results and data from qualitative interviews. These results focus on the extent of interpretation, discussion and perception of the feedback reports which was reported to have been undertaken in schools.

4.8.2 Chapter 6: Organisational social networks for health and wellbeing

Chapter 6 reports case study schools' commitment to health and wellbeing in terms of leadership, embeddedness of health roles and student voice structures. As represented in Figures 4 and 5, it aims to answer research questions 'a', 'c', 'd' and 'e' through conducting social network analysis and semi-structured interviews with staff, students and parents. The chapter begins by presenting the social networks of Wellbeing Leads and school staff with regards to the variation in the number of non-teaching staff, outside agencies and senior management that were included within them. The level of team structure developed within each school is also considered. This chapter then utilises qualitative data to discuss whether there exists a tension between the allocation of the role of Wellbeing Lead to a senior member of staff with the power to make changes within the school and a more junior member of staff who may be able to dedicate more resources to the role. Various types of leadership structures and the role of non-teaching staff and school-level socioeconomic status within these are discussed with regards to school health.

4.8.3 Chapter 7: School system functioning and its relationship with health improvement activity consistent with the Health Promoting Schools approach

This chapter focuses upon the level of implementation of health improvement activities and system orientation aligned with the Healthy Schools Scheme Framework within case study schools. As represented in Figure 5, it aims to answer research questions 'd' and 'f' through semi-structured interviews with staff, students and parents and referring back to results of the social network analysis to contextualise these findings. The chapter focuses upon three key areas: engaging parents, creating a healthy school ethos and embedding PSE within the curriculum. In terms of PSE, the structure of PSE programmes and its perceived effects are considered, as well as who should deliver the lessons. The extent to which schools embed health messages within the curriculum is discussed. While, in terms of school ethos, stakeholders perceptions of the core values of the school and the level of prioritisation of pastoral care and personal development alongside education is discussed as well as students' perceptions of the teachers' level of caring about students in the school. Lastly, the multiple strategies employed to engage parents are discussed.

5 Results: Understanding variance in response to, and engagement with, a collaborative research network

5.1 Introduction:

The overall aim of this chapter is to explore variance in the level of engagement with SHRN within different school systems. It will contribute to understanding the following research questions:

a) How do system starting points and characteristics give rise to variability in initial responses to efforts to engage schools in a discussion about health improvement?

b) To what extent, and in what ways, do school stakeholders perceive a collaborative research network to offer potential for reorienting school systems towards health and wellbeing?

c) How does the position of schools within broader systems, and in relation to external systems, impact their functioning and responses to a collaborative research network?

This chapter will present results from the survey and qualitative interviews. The purpose of presenting these findings is to take the opportunity of the inception of SHRN to explore how the network couples with school systems in the early stages of its implementation. SHRN is an infrastructure for school-based health improvement research in Wales, details of which were outlined in section 4.1.1 of Chapter 4.

The chapter will begin by outlining the survey results to assess variability between schools in the extent to which the SHRN feedback was perceived, distributed, discussed and used within schools, and perceived as influencing health

improvement. This will be presented as an average for all schools in SHRN in 2014-2015 who completed the survey. Next, results will be compared across the four case study schools[2] with varying levels of relative educational performance and embeddedness of health, as outlined in Chapter 4 (see Table 3). Highbridge School had a relative educational performance (i.e. the residual from a school-level regression model adjusting for FSM entitlement of the school) of 19.1% (education rank 1), Greenfield School 10.6% (education rank 2), Oakwood School 6.2% (education rank 3) and Woodlands School 0.5% (education rank 4). Additionally, Highbridge School was ranked highest in terms of embeddedness of health (embeddedness rank 1), Woodlands School second (embeddedness rank 2), Greenfield School third (embeddedness rank 3) and Oakwood School fourth (embeddedness rank 4).

Next, qualitative data will be presented to elaborate upon and contextualise the results of the survey from the perspective of CAS thinking (Hawe et al., 2009b) and Strong Structuration Theory (Greenhalgh & Stones, 2010; Stones, 2005). There will be a particular focus on the interactive, reciprocal relationship between structure and agency, and how this contributes to the implementation of SHRN into different school systems.

5.2 Survey

This section will report the results of the survey of schools who were members of SHRN in September-December 2014. The network had 69 member schools at this time, which included three of the case study schools; Greenfield, Woodlands and Highbridge.

5.2.1 Survey response rates

Representatives from 34 schools, out of a possible 69 members of SHRN, completed the survey. As assessed by Mann Whitney tests, the 34 participating schools did not

[2] *Oakwood School was not a member of the School Health Research Network at the time of the initial data collection, so their survey response was collected in June 2016 and is not incorporated into the averages for the 2014-2015 school year.*

differ from non-completing SHRN schools in terms of mean number of students (950.3 vs 909.5, p=0.75), percentage free school meal entitlement (17.5% vs 18.0%, p=0.39) or English language medium (63.6% vs 72.2%, p=0.69). Many respondents reported multiple roles within the school. Roles of survey completers consisted of SMT (47.1%, N=16) and Wellbeing Leads (47.1%, N=16); 11.8% (N=4) reported both the role of Wellbeing Lead and membership of the SMT.

5.2.2 Initial responses to feedback reports

Of all respondents, 73.5% (N=25) reported that they had received their SHRN health report and 54.3% (N=19) that they had read 'all' or 'most' of it. Moreover, 14.3% (N=5) reported that they had read 'some' of the report. Almost all (88.2%; N=15), who were part of the SMT, reported having received the reports, compared to 76.5% (N=13) of Wellbeing Leads. Of the four Wellbeing Leads who reported not having received the report, none were members of the SMT. Moreover, 68.8% (N=11) of respondents who were part of the SMT reported that they had read 'all' or 'most' of the Health Report, compared to 43.8% (N=7) of Wellbeing Leads. Among participants who had read at least some of the report, all (N=24) perceived it to be potentially 'very' or 'somewhat' useful as a planning tool for health improvement, whilst 8.3% (N=2) reported that their school would be likely to suffer negative consequences as a result of the report.

Responsibility for interpreting the report was held by the Head Teacher in 33.3% (N=8) of schools and by the Deputy Head in 45.8% (N=11) of schools. The Wellbeing Lead was reported to be responsible for this in 50.0% (N=12) of schools. Schools reported the most important facilitators for utilising the health report to enhance health improvement were; time available (67.7%), funding available (52.9%) and practical assistance from outside agencies (50.0%).

5.2.3 Discussion and distribution of feedback report and generation of ideas for health improvement

Overall, 66.7% (N=16) of participants who had read at least some of their report indicated that results had been distributed to their colleagues, with a further 20.9% (N=5) reporting intention to do so. For all stakeholders, apart from 'colleagues' a

higher percentage of participants reported planned than actual discussion. Composite scores for discussion of the report varied from scores of 0 to 9, with a higher score indicating a higher level of discussion. Among those who had read the report, the median score was 3.5, with an interquartile range of 3.8 for actual discussion and 6, with an interquartile range of 4 for planned discussion.

As a result of receiving the health report, 66.6% (N=16) of schools, who had read at least some of their report, reported that they had 'some' or 'lots' of new ideas for health improvement in their school, with a further 16.7% (N=4) reporting that they had '1 or 2' ideas. Out of all respondents, 48.6% (N=17) reported that they were 'likely' or 'very likely' to need more support to be able to utilise the report, compared to 34.3% (N=12) who reported that it was 'not likely' or 'not at all likely'. Out of all schools who completed the survey, a composite score for perceived likelihood of impact on future health improvement showed a mean score of 11.7 (SD= 3.1) out of a possible high score of 15, indicating high overall confidence that the reports would act as a catalyst for change.

5.3 Responses to SHRN health reports among case study schools

5.3.1 Initial responses to feedback reports

Within each of the four case study schools it was the Wellbeing Lead who completed the survey. Wellbeing Leads from Greenfield and Woodlands Schools reported that they had read 'some' of the report, with Greenfield School reporting that it would be 'somewhat useful' and Woodlands School a 'very useful' planning tool. In contrast, the Wellbeing Lead from Oakwood School reported that they had read 'all' of the report and that it would be a 'somewhat useful' planning tool. Whilst Highbridge School reported having read the whole report and reported that it would be a 'very useful' planning tool. All case study respondents reported that it was 'not likely' or 'not at all likely' that their school would be likely to suffer negative consequences as a result of receiving the feedback report.

5.3.2 Discussion and distribution of feedback report and generation of ideas for health improvement

The Wellbeing Leads from Greenfield and Woodlands Schools reported that the results from their SHRN health reports had not been distributed or discussed with school stakeholders. In contrast, Highbridge School reported that they had distributed the results to 'some' colleagues and discussed the results with 'some' colleagues, students, other schools, parents and outside agencies. Moreover, Oakwood School reported that they had distributed the results to 'some' colleagues and discussed the results with 'some' colleagues, students, parents and governors.

The composite score for discussion was 0 for Greenfield and Woodlands Schools, indicating that discussion had taken place at the point of data collection. In contrast, a score of 4 was calculated for Oakwood School and a score of 5 out of a potential 16 for Highbridge School, indicating that these schools were discussing results of the Health Report with some stakeholders. Despite their low level of discussion, the composite scores for planning to discuss was 8 for Greenfield School and 10 for Woodlands School, with both reporting planning to discuss reports with at least 'some' of each stakeholder group. Moreover, Woodlands School intended to discuss the results of the Health report with 'lots' of students and 'all or most' parents, whilst Greenfield School intended to discuss with 'all' colleagues.

Greenfield School reported that they had 'no new ideas' as a result of receiving the Health Report, whereas Woodlands School reported that they had '1 or 2' and Highbridge and Oakwood Schools 'some'. Greenfield School reported that they were 'not at all likely' and Woodlands and Oakwood Schools reported that they were 'not likely' to require more support to take action from the feedback. Whereas Highbridge School reported that they would be 'likely' to require more support in the form of local group support for PSE. On the composite measure of perceived likelihood of the reports impacting on school health improvement, Oakwood School had a score of 0 out of a possible 10 and Greenfield School had a score of 1, compared to Woodlands and Highbridge Schools who had scores of 6 and 8, respectively.

5.3.3 Attendance at SHRN events

Every year SHRN organise and host engagement events for representatives from schools and the Welsh Network for Healthy Schools to get together and share good practice. In June 2015 Oakwood School was not a member of the network and therefore did not attend. Whilst Greenfield School sent a Wellbeing Assistant, Woodlands School sent the Assistant Head/Wellbeing Lead, and Highbridge School sent a teacher. Moreover, the Wellbeing Lead from Highbridge School also attended to give a presentation of their use of the SHRN Health Reports. In June 2016, whilst remaining a member of the network, Greenfield School did not send a representative to the event. In contrast, Woodlands School sent the Assistant Head/ Wellbeing Lead, Highbridge School sent a Teaching and Learning Manager and Oakwood School sent the School Nurse, who was also a member of the SMT.

Taking into consideration event attendance alongside the survey results, these show Highbridge School to display a very high level (engagement rank 1), Oakwood a high level (engagement rank 2), Woodlands School a medium level (engagement rank 3) and Greenfield a low level (engagement rank 4) of initial engagement with SHRN. These metrics are indicated in Table 7 below, with case studies presented in order of level of engagement with SHRN (highest to lowest).

Table 7 Summary of case study school engagement with the School Health Research Network, ordered from highest to lowest engagement

Case Study School	SHRN event attendance	Seniority of staff attending SHRN events	Read report	Perceived usefulness of report as planning tool	Composite score for discussion	Composite score for planning to discuss	New ideas emerging from report	Perceived of report i health imp
Highbridge	2/2 possible events	Both junior and senior members of staff	All	Very useful	5/16	n/a	Some	Likely
Oakwood	1/1 possible events	Senior members of staff	All	Somewhat useful	4/16	n/a	Some	Not likely
Woodlands	2/2 possible events	Senior members of staff	Some	Very useful	0/16	10/16	1 or 2	Not likely
Greenfield	1/2 possible events with a junior member of staff	Junior members of staff	Some	Somewhat useful	0/16	8/16	None	Not at all l

5.4 Qualitative perceptions of the School Health Research Network

This section will present a qualitative elaboration of the above survey results. This will include a discussion of how all four case study schools perceived school level feedback provided by SHRN, and their suggestions for its use.

5.4.1 Awareness of SHRN

Despite the generally positive outlook on the potential usefulness of the health reports within the school, it was clear that, consistent with the survey results showing limited distribution and discussion, many staff were not aware of SHRN. Although this was often not explicitly stated, most staff spoke of its potential uses in a theoretical sense and only after SHRN had been described to them. In fact, apart from the Wellbeing Leads in the three schools who were network members at the time of qualitative data collection and were all aware of its existence, only six staff explicitly stated that they were aware of SHRN, all of whom were members of Senior Management or those with a specific health/wellbeing role within the school. This leaves seven members of staff who did not report awareness of the network. This limited initial awareness of SHRN was supported by parents, whereby only two of those interviewed were aware of SHRN due to communication from their children; both from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), and both also members of staff at the school.

A possible explanation for this lack of awareness was highlighted by the SHRN Manager. She stated that, due to the reports being sent directly to Head Teachers, they were often not distributed further. Although she did also report that schools seemed very keen once they had seen the data, the distribution of the report could be seen as a barrier to reaching this point and, subsequently, taking action.

> *"And I think in lots of cases, certainly the schools that I've been visiting, they [the reports] sort of stopped at the Head Teacher and they weren't sent more widely (…)" SHRN Manager*

This procedure has since been altered in response, with the 2016 reports being sent directly to the main contact in the school, as opposed to Head Teachers.

5.4.2 Perceived value of SHRN and potential effects

Despite the limited awareness and discussion of SHRN outlined within the previous section, all schools were enthusiastic about the potential and theoretical benefits of SHRN in principle. The SHRN Manager reported that in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) 'wellbeing is really core to their, to the way they think' due to the high level of need in an area of high socioeconomic deprivation. Whilst she did not feel that she had had enough involvement with Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) to comment, the SHRN Manager reported that Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) had been enthusiastic about the network in general thus far, such as through attending events and using associated resources.

> *"(…) certainly when [name of Wellbeing Lead for Greenfield School] came to the event she was full of enthusiasm for the things that we were trying to do." School Health Research Network Manager*

School staff highlighted the potential value of the data in prioritising resources. The discussion of 'potential value' further supports the survey results with regards the limited immediate coupling of SHRN with the school system thus far (Hawe et al., 2009b). However, it also highlights enthusiasm and potential for the network and health report results to be used more widely and for greater awareness of and engagement with the network to be achieved over time.

> *"It's nice to understand where, what areas we would have the most difficulty and where we could put that support in for them. (…). So* ***that information would be really valued for us here in the school****" Highbridge School, Wellbeing Manager*

*"I think so because **it would give you a really good indication of what you need to prioritise**, maybe in PSE lessons and things like that. So I could see that it would be of use, yes." Oakwood School, Learning Support Assistant*

*"Oh yes, that's a good idea because **you can work with that information just like we work with the academic information** about their grades and their attendance. **You can target specific groups with regards their health** if it's a point system or if it's a questionnaire, to analyse the results and work with those children." Woodlands School, PE Teacher*

This is consistent with the results of the survey, where case study schools reported that the health report would be a 'somewhat' to 'very useful' planning tool.

Staff from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) went one step further and highlighted the potential for interacting with other systems (Keshavarz et al., 2010) by comparing their health report results with, and obtaining advice from, other schools to share good practice with regards to wellbeing.

In addition, the Learning Support Assistant from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) spoke of the potential to use the health report results as a tool to raise awareness of health issues among parents and students. This again refers to the facilitation of interaction with other systems and subsystems (Keshavarz et al., 2010). This suggests that, despite survey results showing limited distribution or discussion of the health report with school stakeholders in Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) and Woodlands Schools, there is a willingness and intention among schools to share results.

Moreover, the Healthy Schools Coordinator for Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) emphasised that the health reports were an example of student voice and could bring issues to the attention of senior staff,

thus providing feedback loops so that schools are able to tackle the relevant issues and adapt to need (Keshavarz et al., 2010).

> *"(…)* ***I think the student voice is probably more important than what we think is going on in a school, because it will really show us what these issues are within each school****. (…) Having it in black and white so we can say 'well this is a problem', let's act on it and do something about it and then seeing if the problem resolves over time, so I think they'll add a lot to schools." Greenfield School, Healthy Schools Coordinator*

These data may serve to alter students' intrinsic factors (general dispositions and knowledge of how they should act) as they may obtain an improved understanding of the problem and be able to understand norms in relation to health behaviour by comparing the national and school averages in the report. They could also obtain an increased sense of power over actions taken as a result of student voice due to the ability to support their recommendations for change using the report data (Stones, 2005). Thus this could contribute to the development of a more bottom-up approach to health and wellbeing-related decision making.

This could be true for more junior members of staff who want to influence decisions made within the SMT. For example, the Wellbeing Lead in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) described plans to use a summary of the health report data to guide discussion and selection of topics within a student voice group dedicated to wellbeing. Whilst students and parents from all case study schools also felt that students should be shown the data.

> *"Well if there is a lot of, say in Year 7, if there are a lot of people smoking you'd probably be more wary because most people get into smoking because they're offered a cigarette (…)" Oakwood School, Student interview 3, Year 7 boys*

This may help to increase interaction between subsystems (Keshavarz et al., 2010). In support of this, many parents felt that use of this data may help to improve the relevance of PSE, promote student voice and increase awareness among students.

> *"(…) I mean they could be talking about their own year [in PSE] couldn't they and I suppose it would make them more aware as well." Oakwood School, Parent interview 1, not a member of staff*

Enthusiasm was also reflected in student interviews, with students from each case study school stating that they believe school staff would try to improve health as a result of the health report results. Indeed, within the survey, staff from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) reported having '1 or 2' new ideas whilst Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) Schools reported having 'some' new ideas as a result of receiving the health reports. However, Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) reported having no new ideas.

> *"Yeah I agree I think yeah if a school is doing, doing below average then they will see that and try to improve things." Greenfield School, Student interview 1, Year 8 boys*

> *"It could like improve what we aren't doing right, like if we didn't do something as good we could do something to improve that." Woodlands School, Student interview 1, Year 8 boys*

This was perceived by some students to be particularly important since they believed that teachers were currently oblivious to the health behaviours of students. Thus, the provision of the health report may help to improve teachers' understanding of the student subsystem and may improve interactions between them (Hawe et al., 2009b; Keshavarz et al., 2010). Students from Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) and Oakwood (engagement rank 2, education rank 3,

embeddedness rank 4) Schools even stated that this could help to systematise health improvement activity in the school. This relates to the organisation of information flow in CASs, facilitating the prioritisation of information which is relevant to each school's requirements.

> *"(…) it helps them deal with the more dominant issues, whereas before they just deal with what they can see." Oakwood School, Student interview 4, Year 7 and 11 boys*

> *"Maybe if people are smoking in year 8 maybe they can focus on them and try and make them stop." Woodlands School, Student interview 2, Year 8 boys*

5.4.3 From needs assessment to action

Barriers internal to the school

Many staff felt that, although it was useful to receive the report, there were many barriers within the school to converting this information into meaningful and tangible actions for health improvement. This sits in contrast to the survey results; within the survey Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) and Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) Schools had high scores on perceptions of whether the report would impact health improvement activity in their schools. Thus, qualitative investigation may have brought out the intricacies of the barriers faced to implementation.

These difficulties may arise from the internal structure (the structural context of action within the school gates) of a lack of infrastructure surrounding wellbeing within schools. For example, there may be a lack of provision of non-teaching roles dedicated to wellbeing and a team structure to ensure that this practice is embedded throughout the school. These internal structures may be independent for most staff, meaning that staff do not have any physical capacity to overcome them. However, for Wellbeing Leads in more senior positions, some of these structures may be irresistible, meaning that they may have the power to influence such factors. Action is also dependent upon their level of knowledge of the structural terrain (Stones, 2005). For example, this encompasses Wellbeing Leads' knowledge of the rules

surrounding the creation of new non-teaching roles and their perceived power to do so.

> *"Just think there should be action really because it's data you're looking at but those children are not just dots on graphs or points, there's just working with them and what we,* ***it's the action and the funding is the barrier really****." Woodlands School, PE Teacher*

In line with this, the SHRN Manager reported that changes take time to embed within a school system. This is in line with the conception of schools as CASs and the difficulty of embedding interventions or innovations into a system (Keshavarz et al., 2010).

> *"(…)* ***they've [schools] got all sorts of different plans*** *in relation to curriculum, using it in the curriculum, using it with parents, using it with student voice groups. So some have started doing that [using the reports] but I think it is, it's going to be longer term,* ***I think it's going to take a while for it to become standard use****." SHRN Manager*

A parent from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) highlighted the difficulty in utilising the data to strategically plan and undertake health improvement activities and believed that schools were already comprehensively addressing the relevant issues. Hence, this indicates a perception that using the data to promote health would involve a greater quantity of health improvement action, rather than greater efficiency.

> *"(…) we could know to target certain year groups with certain year groups with certain, certain issues and certain you know pieces of education* ***but the school does quite a lot already*** *with regards to PSE, smoking, tobacco, alcohol and they do, sort of they target year groups where they know it's an issue (…).* ***So I think it***

would be useful for the school but you know would they be able to do anymore?"
Woodlands School, Parent interview 3, Female, Member of staff, Teacher

Sharing data with students

Suggestions for sharing the SHRN data with students included integration into PSE lessons and talks in assembly, thus altering the internal structure (the structural context of action within the school gates) of the school (Stones, 2005). Corroborating this, the SHRN Manager suggested that, from her interactions with many SHRN schools, she perceived that schools intended to use the data within student voice groups, PSE and other relevant parts of the curriculum, such as the Welsh Baccalaureate.

This view of the power of education and social norms in changing behaviour was reflected in a response from a parent in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) who suggested that the data could be used to increase peer pressure and therefore increase physical activity among students.

"(…) you could have something like, I don't know, that they're not reaching the average of something with physical activity, 60 minutes a week, or 60 minutes a day isn't it? Something like that could be useful, to encourage them (…)" Highbridge School, Parent interview 1, Female, Member of staff, Teaching Assistant

A student from Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) suggested that simply showing students the data would not lead to behaviour change. Moreover, students from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) believed that, if shown to them, students would ignore the data. Thus, this perhaps calls for the need for a more engaged model to help schools to utilise feedback effectively to plan system change, rather than using the data as an intervention in itself to directly influence student behaviour. This is supported by Strong Structuration Theory in that, although students' general dispositions and knowledge of how they are supposed to act

(intrinsic factors) may be altered in terms of attitude and their knowledge of the strategic terrain, this may not interact with individual agency to result in action. Indeed, a review of HPS found that education was not sufficient for behaviour change and that those interventions combining education with social and environmental manipulation were most likely to produce positive results (Langford et al., 2014).

> *"**I feel like most people would ignore the booklets or facts like that**, they would ignore them because they just, they have their personal opinion and they have a strong opinion like when it comes to smoking and stuff. If you tell them to stop smoking they won't take it personally and they will just [be] like 'oh I will smoke, nothing will happen to me or it will just happen to other people'." Woodlands School, Student interview 3, Year 9 girls*

Several stakeholders discussed the barriers to students being shown the SHRN health report data. A parent from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) plus a parent from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) raised the potential issue of iatrogenic effects, whereby seeing the data may serve to normalise unhealthy behaviour.

> *"(…) in some ways it might make them think 'oh well everybody's doing this, maybe I should' so I don't know if it would be (…)" Oakwood School, Parent interview 3, not a member of staff*

Whilst students outlined potential ways of using the data including, when suggested by the researcher, integrating it within mathematics and other core subject lessons.

> *"I think that's a really good idea because I'm in Foundation set for Maths and I can do bar charts fine no problem but I know other people do struggle with it and I know people need extra support on certain topics, I know that's quite a big topic so*

> ***I think if it was brought into lessons I think it wouldn't just help people with their health it would help people with their Maths or their Science or their English*** *(…)"*
> *Woodlands School, Student interview 4, Year 10 boy, Year 11 girl*

Year 7 boys from Oakwood School raised a concern that sharing the SHRN data with students may mean that students are less likely to provide valid survey responses in the future, despite the shared data being anonymised. Another student insisted that, even if the data were anonymised, revealing data to students may cause angst among those students who were partaking in unhealthy behaviours.

> *"S1: I think it also may be bad because if somebody's smoking,* ***they also most likely won't admit it because they'd probably be ashamed of it****, or they wouldn't want people to know about it. R: not even in an anonymous questionnaire? S2: ah yeah probably then, but some people still might not want to because S1: just in case"*
> *Oakwood School, Student interview 3, Year 7 boys*

Barriers external to the school

Barriers external to the school were also discussed, including sharing SHRN data with parents and the pressure applied by wider political and educational supra-systems.

Sharing data with parents

Only two members of staff discussed sharing data from the SHRN report with parents. The Wellbeing Lead from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) spoke of her intention to talk about the results of the report with parents and the Governing Body, whilst the Learning Support Assistant from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) perceived it to be important to share this information with parents but stated that some parents may be shocked and may not be open to receiving such information.

*"(…) I think **parents and students will probably be quite shocked** maybe with some of the results. To raise awareness of issues that are ongoing. (…) I think so, **maybe not all but I think most parents would be [open to the results of the feedback report]**." Oakwood School, Learning Support Assistant*

Some students also perceived it to be important to share the SHRN data with parents in order to inform them of what is going on and stimulate conversations with their children. However, students from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) highlighted concerns that this may result in 'league table' thinking.

*"S1: (…) **they'll think it's a bad school, take them to another school if they see the charts** S2: because if you're putting it into categories if parents see it they might think ah there's a high number of things whereas it might not be the case. It doesn't make it a bad school, **it just sort of looks a little bit bad when one or two things are a bit high**." Oakwood School Student interview 4, Year 11 and Year 7 boys*

In contrast to this, the SHRN Manager suggested that the report data could be used by schools to start a conversation with, and to engage, hard to reach parents. She states that this may have quite an impact due to this group being more likely to engage in behaviours that may be detrimental to their health.

*"(…) a couple of schools have mentioned they have parent groups, particularly a couple of schools have mentioned **parents of hard-to-reach students that they sort of try and involve in a sort of a group, an ongoing group so they felt it would be useful to talk through some of that** (…)" SHRN Manager*

Whilst these data may be a useful tool for engaging parents, the above data highlight the barriers to such activity and the subsequent importance of taking care when

interacting with sub-systems and between systems, as unintended consequences may occur (Keshavarz et al., 2010).

Interpreting and taking action from the SHRN feedback reports

In addition to the difficulty of producing tangible action, and consistent with and building upon survey results, some staff reported that structures such as workload and time pressures created barriers to actually reading the report and contributing to the implementation of this into everyday practice (Stones, 2005). This may be attributed to a perception that health improvement is not central to the core aims of the school and therefore may be side lined whilst activities, such as literacy and numeracy, are prioritised.

> *"So that's certainly something that's going to inform future planning for PSE and there are things that I can glean from that. But* ***it's literally probably number three or four down on my 'to do' list****." Woodlands School, Wellbeing Lead*

> *"(…) I suppose* ***time is a barrier****. Time to analyse the data and sort of work out what can be done I suppose that's an issue isn't it?* ***Because of like teaching commitments and stuff so that will be a barrier*** *(…)" Greenfield School, Food Technology Teacher*

In contrast to this, the SHRN Manager stated that schools perceive the SHRN report in a positive light, stating that 'they are fantastic for that [ESTYN]'. As well as the report highlighting areas for improvement, the SHRN Manager also perceived it to be important that schools celebrate positive results arising from the report. The curriculum review by Donaldson (2015), commissioned by the Welsh Government, included wellbeing as a key factor within the curriculum going forward. Although unaware of the outcome of the review at the time, the SHRN Manager suggested that this could facilitate the use of reports within the school to help to fulfil this part of the curriculum. Furthermore, the SHRN Manager highlighted that the Welsh Government had included health and wellbeing as a part of their inspections, overseen by the Welsh school inspectorate, ESTYN.

*"(…) I think in Wales we're quite lucky because **Welsh Government I think has, in the past, particularly recognised the importance of health**, and that I think was shown with the, with ESTYN going in and inspecting wellbeing and wellbeing issues." SHRN Manager*

Despite this progress the SHRN Manager also highlighted the problem of educational issues, such as the Government's push for higher attainment in literacy and numeracy, being seen as competing priorities to wellbeing.

5.4.4 Collaboration with and support from outside agencies

Support from outside agencies for interpreting the SHRN feedback reports

Staff expressed difficulty in finding the time to analyse the data from the health report and to create an action plan, with some perceiving the need for an outside agency or a member of staff with a dedicated wellbeing role to undertake this. Due to the high workload, and perhaps the lack of expertise within health improvement, support from outside agencies in interpreting and taking action from the health report was considered a useful way forward and a potential catalyst to action by several school staff. Provision of a more engaged model of working with schools to interpret data and plan action could therefore serve as a means of potentiating the uses of the health report in supporting system change.

*"I think that the report would be really useful to see and to pick out what are the key things, because it could be quite broad as well so it would be taking that report but then **having someone help you decide what are you going to focus on for this year, what's it going to be, breaking it down into a point plan with clear aims and objectives is something you could tackle**, whereas perhaps a vast report on it could be overwhelming." Woodlands School, Food Technology Teacher*

"Yeah any knowledge that anybody can give, surely would be an advantage." Highbridge School, Teaching Assistant

*"I think it's quite important in terms of wellbeing for the children to have every avenue covered, and **if there is somebody that is able to look at data and say well***

> ***you know you've got a drinks problem here that I can recommend you use A, B and C to help you with that****, to help encourage the children to have a healthier lifestyle, I think it would be beneficial to all of them (…)" Greenfield School, Student Support Manager*

Building on this, some school staff suggested that working with outside agencies, such as their Healthy Schools Coordinators and utilising the data for evidencing the Healthy Schools Awards would be a good way to increase utilisation of the results of the health report.

> *"(…) But I do think yeah it's important and you don't feel as alone doing it if you've got collaboration with outside teams and leaders* ***because I don't feel that I'm fully trained or I haven't got the expertise to implement something on my own****, that kind of thing." Woodlands School, Food Technology Teacher*

> *"(…) so that would, so basically we've got the quality award now but I don't know where they can go next. But in order to sustain the quality award because obviously you've got to sustain it and you've got to pass every two years I think it is. That might be good to have in the food and fitness section [the health report results]. It would just be something extra to have if they, because it's a new initiative,* ***it would be good for a school to take it on and put it in their quality award evidence when they give the evidence to the inspector****." Greenfield School, Food Technology Teacher*

The SHRN Manager supported the idea of the reports helping to guide collaboration with the Healthy Schools Coordinators, providing the example of the reports facilitating selection of action areas for the National Quality Award, which is the highest accolade in the Healthy Schools Scheme. She also proposed that the barrier of time, in terms of SHRN staff visiting and providing support to all schools, could be overcome by SHRN staff working closely with and providing training for Healthy Schools Coordinators to improve their research literacy and help them to provide support to schools on a more local level in interpreting and using the reports.

*"And **our plans to link much more closely with the Healthy Schools Network I think will be, has huge benefits** because there is a team in each authority so if schools when they plan their health actions and when they evaluate their health actions they, they could call on local, local people." SHRN Manager*

Support from outside agencies in facilitating information sharing between schools

Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) recognised that, whilst they had built a good support system of outside agencies and that this was vitally important in successfully making changes to the school system, other schools did not have this in place. This highlights that, after interpreting the feedback reports, the next step of enacting agency may require further infrastructure in order to support change.

*"We've got a really good programme of outside agency support, but I know the other schools that were at the conference didn't have that. So they were looking for, sort of, a blue print to say we've identified smoking as an issue in a particular school, then where do we go to get that help? You know, and I think that was probably the next, so **it's all very well and good doing the research but you need to say, well actually there are people who can help here, and you know offer those services**(…)" Highbridge School, Wellbeing Lead*

The Wellbeing Manager in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) contradicted this by stating that extra infrastructure is required to identify and clarify which outside agencies can provide what types of support in order to facilitate action by school staff. This shows the importance of supporting interactions between systems in order to bring in new ideas (Keshavarz et al., 2010). It also demonstrates that staff may perceive internal and external structures (the structural context of action within and outside of the school gates) and

intrinsic factors (general dispositions and knowledge of how they should act) to present barriers to such action (Stones, 2005).

Further strategies through which support could be provided by outside agencies were suggested, such as the provision of training during INSET days (Non-contact days for staff development) and information sharing between schools through PSE meetings facilitated by an outside agency. However, the sharing of best practice through PSE meetings was suggested by the Healthy Schools Coordinator for Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3), and therefore may not be indicative of schools' willingness to share such information and interact with other systems openly (Keshavarz et al., 2010).

Moreover, the SHRN Manager suggested schools' confidence could be built and that schools could learn from each other through sharing good practice during SHRN events. Every year summer events are held in North and South Wales to encourage knowledge exchange among schools and between the network staff and schools. This may result in improved interaction between systems (Keshavarz et al., 2010) and improved intrinsic factors (general dispositions and knowledge of how they should act), such as confidence building among school staff, in terms of knowing what can be done with the reports and how to do it. It also provides the internal and external structures (the structural contexts of action within and outside of the school gates) to facilitate this (Stones, 2005).

Parents from Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) and Highbridge Schools (engagement rank 1, education rank 1, embeddedness rank 1) who worked within the schools also believed that extra support would be useful for the school.

> *"(…) it's always useful to have people that can point you in the right direction isn't it or arrange for someone to come in and talk to the children and give them advice."*
> *Woodlands School, Parent interview 3, Female, Member of staff, Teacher*

"So yeah I think more signposting of different agencies that we can use to come in and speak would be brilliant (…)" Highbridge School, Parent interview 3, Female, Member of staff, Lead Learning Coach

This support may act as an external structure (the structural context of action outside of the school gates) to facilitate action. This could also alter staff members' intrinsic factors (general dispositions and knowledge of how they should act) in terms of their perceived power to implement changes to school health (Stones, 2005). Thus, this may facilitate the movement of school staff towards reorienting the system towards health improvement (Hawe et al., 2009b).

5.5 Conclusion

This chapter explored variance in the level of engagement with SHRN within different school systems, finding wide variation in the interpretation, discussion and perception of the SHRN feedback reports. Case study schools represented a continuum of this variability. Survey results showed that the position of key actors with responsibility for health within their social network appeared to be important in shaping variation in responses. For example, it was more common for Wellbeing Leads to report not having been aware of the SHRN reports if they sat outside of the schools' SMT. Qualitative data highlighted that while SHRN had, at the time of data collection, achieved a limited degree of permeation into school systems, school stakeholders held positive perceptions of its potential value in systematising health improvement activity and engaging with sub-systems and other systems, such as students, parents and outside agencies.

The need for support from outside agencies, as well as staff training, to move from receipt of the health report to interpretation and action was highlighted by many. Thus, understanding the initial conditions in the form of social interactions of school staff from a complex systems perspective is potentially valuable in understanding how existing system dynamics may impede or facilitate efforts to bring about change. This higher level of understanding of system dynamics could be utilised to design complex interventions, which work with the system to achieve change.

Therefore, through conceptualising schools as CASs, the following chapter will explore the context and system dynamics within the four case study schools, with a particular focus on social networks of Wellbeing Leads within schools and how they facilitate or impede the integration of health into complex school systems.

6 Results: Organisational social networks for health and wellbeing

6.1 Introduction

Chapter 5 showed that schools' responses to feedback were highly variable in terms of the interpretation, discussion and perception of the health reports, and highlighted the potential importance of the position of Wellbeing Leads in their schools' social networks in engagement with feedback. Case study schools represented a continuum of variability in terms of engagement with SHRN and their educational performance relative to schools of a similar composition. Highbridge School demonstrated a very high level (engagement rank 1), Oakwood a high level (engagement rank 2), Woodlands a medium (engagement rank 3) and Greenfield a low level of engagement (engagement rank 4). Highbridge School had a relative educational performance of 19.1% (education rank 1), Greenfield 10.6% (education rank 2), Oakwood 6.2% (education rank 3) and Woodlands 0.5% (education rank 4). See Table 3 in Chapter 4 for figures on educational performance. Additionally, Highbridge School was ranked highest in terms of embeddedness of health (embeddedness rank 1), Woodlands School second (embeddedness rank 2), Greenfield School third (embeddedness rank 3) and Oakwood School fourth (embeddedness rank 4). Qualitative data highlighted that SHRN data had achieved a limited degree of permeation into school systems at the time of data collection, shortly after the network's inception, and many school stakeholders were not fully aware of it. Despite this, positive perceptions of its potential value for systematising health improvement and engaging with subsystems and other systems were reported, such as students, parents and outside agencies.

Through conceiving schools as CASs, the current chapter will build on these findings to further explore functioning of complex school systems and how their health and wellbeing-related social networks may act to impede or facilitate efforts to engage schools in processes of change. Firstly, the ego social networks of Wellbeing Leads for each case study school will be presented, and differences

between the structure of social networks and variation in engagement with SHRN, discussed. Next, qualitative data will be explored to obtain a more in-depth understanding of which aspects of these networks are perceived as more or less functional, as well as a qualitative understanding of the nature of these interactions. It will also explore the extent to which data from the previous chapter, regarding level of engagement with SHRN, support these findings. This chapter will draw upon the theoretical perspectives of CAS thinking (Keshavarz et al. 2010), Strong Structuration Theory (Stones, 2005), Structural Hole Theory (Burt, 2004) and the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003). Additionally, it will go one step further to explore how schools work to develop positive relationships with staff and students.

The overarching aim of this chapter is to explore variance in staffing structures and student voice and implications for the orientation of school systems toward health. It will contribute to understanding the following research questions:

d) To what extent is health and wellbeing embedded into social networks of the school system and how do interactions, internal and external to the school, facilitate the implementation of health improvement activity in schools and the development of schools as healthy systems?

e) How are the structure of school health-related social networks and the position of key actors within these networks associated with engagement with a collaborative research network and the orientation of school systems toward health?

a) How do system starting points and characteristics give rise to variability in initial responses to efforts to engage schools in a discussion about health improvement?

c) How does the position of schools within broader systems, and in relation to external systems, impact their functioning and responses to a collaborative research network?

6.2 Ego Social Network Analysis

6.2.1 Frequency and importance of interactions

Tables 8 and 9 detail the quantitative network characteristics for each of the four case studies, whilst Figures 5-13 and Tables IV-VII provide net-maps and keys. In Woodlands (engagement rank 3, education rank 4, embeddedness rank 2), Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood Schools (engagement rank 2, education rank 3, embeddedness rank 4), the Wellbeing Lead was more tenured at the location than their network alters, with 87.1-100.0% of alters having been reported to have joined the school more recently than the Wellbeing Lead within these schools. The converse was true with Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) where the Wellbeing Lead reported that 60.0% of staff within her ego network had joined the school before her.

Table 8 Characteristics of Wellbeing Leads' ego networks

Alter attribute		Greenfield School	Woodlands School	Highbridge School	Oakwood School
Frequency of interaction between alters and ego	More than once a day	4/20 (20.0%)	8/31 (25.8%)	7/25 (28.0%)	11/32 (34.4%)
	Daily to 2-3 times a week	4/20 (20.0%)	8/31 (25.8%)	9/25 (36.0%)	5/32 (15.6%
	Weekly-monthly	8/20 (40.0%)	10/31 (32.3%)	9/25 (36.0%)	2/32 (6.3%
	Once a term or less	3/20 (15.0%)	5/31 (16.1%)	0/25 (0.0%)	3/32 (9.4%
	Unknown	1/20 (5.0%)	0/31 (0.0%)	0/25 (0.0%)	1/32 (3.1%
Length of service	Joined before ego	12/20 (60.0%)	2/31 (6.5%)	0/25 (0.0%)	0/32 (0.0%
	Joined at same time as ego	0/20 (0.0%)	2/31 (6.5%)	0/25 (0.0%)	0/32 (0.0%
	Joined after ego	7/20 (35.0%)	27/31 (87.1%)	25/25 (100.0%)	32/32 (100.0%)
	Unknown	1/20 (5.0%)	0/31 (0.0%)	0/25 (0.0%)	0/32 (0.0%
Importance of interactions	Not important	3/20 (15.0%)	1/31 (3.2%)	1/25 (4.0%)	2/32 (6.3%
	Important	5/20 (25.0%)	12/31 (38.7%)	1/25 (4.0%)	5/32 (15.6%
	Very important	7/20 (35.0%)	11/31 (35.5%)	8/25 (32.0%)	8/32 (25.0%
	Extremely important	5/20 (25.0%)	7/31 (22.6%)	15/25 (60.0%)	17/32 (53.1%)

Within Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), reported interactions about health improvement with outside agencies were more frequent compared to the other three case studies (see Table 9). In addition, interactions with parents, students and teaching staff were less frequent in Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) and Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) Schools, compared to Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood Schools (engagement rank 2, education rank 3, embeddedness rank 4). Woodlands School's Wellbeing Lead reported the highest frequency of interaction with non-teaching staff, whilst the Wellbeing Leads from Greenfield, Oakwood and Woodlands Schools reported interacting with all SMT within their network about health improvement more than 2-3 times per week (see Table 9).

Overall, Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) reported the highest proportion of interactions as extremely important (15/25; 60.0%) (see Table 8), which included substantially more interactions with outside agencies (4/8; 80.0%) rated as 'extremely important' for school heath than the other three case studies (see Table 9). The Wellbeing Lead in Greenfield School reported one out of three (33.3%) and Woodlands School reported three out of eight (37.5%) interactions with outside agencies as extremely important. Meanwhile Oakwood School reported four extremely important interactions with outside agencies, although this only amounted to 26.7% due to a high number of reported interactions within this group.

The Wellbeing Lead for Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) did not rate any interactions with the SMT, teaching staff or non-teaching staff as important. Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) reported two out of two, the highest percentage (100.0%) of extremely important interactions with SMT members. This was closely followed by Highbridge School which reported four out of five (80.0%). Both Highbridge and Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) schools reported extremely important interactions with 100.0% of teaching staff in their networks, whilst Oakwood School reported the highest number of extremely

important interactions with non-teaching staff (80.0%). Woodlands (4/4), Highbridge (2/2) and Oakwood (2/2) Schools all reported that 100.0% of their interactions with parents and students were extremely important, compared to 0.0% reported by Greenfield School (0/3). These findings that the Wellbeing Lead from Highbridge School reported the highest percentage of extremely important interactions is consistent with their highest rank of the case study schools for engagement with SHRN, and for the embeddedness of health improvement into the school. See Table 9 for an overview of these data.

Table 9 Number (and percentage) of interactions within each department that have been rated with a high frequency and extreme importance within the Wellbeing Leads' ego networks

Attribute		Senior Management Team	Teaching staff	Non-teaching staff	Parents and students	Outside agencies
Frequency of interaction >2-3 times per week	Greenfield School	2/2 (100.0%)	3/7 (42.9%)	3/5 (60.0%)	0/3 (0.0%)	0/3 (0.0%)
	Woodlands School	7/7 (100.0%)	1/5 (20.0%)	7/7 (100.0%)	1/4 (25.0%)	1/8 (12.5%)
	Highbridge School	2/5 (40.0%)	2/3 (66.6%)	6/7 (85.7%)	2/2 (100.0%)	4/8 (50.0%)
	Oakwood School	6/6 (100.0%)	4/4 (100.0%)	2/5 (40.0%)	2/2 (100.0%)	2/15 (13.3%)
Interactions rated as extremely important	Greenfield School	2/2 (100.0%)	1/7 (14.3%)	1/5 (20.0%)	0/3 (0.0%)	1/3 (33.3%)
	Woodlands School	0/7 (0.0%)	0/10 (0.0%)	0/6 (0.0%)	4/4 (100.0%)	3/8 (37.5%)
	Highbridge School	4/5 (80.0%)	3/3 (100.0%)	2/7 (28.6%)	2/2 (100.0%)	4/8 (50.0%)
	Oakwood School	3/6 (50.0%)	4/4 (100.0%)	4/5 (80.0%)	2/2 (100.0%)	4/15 (26.7%)

6.2.2 Influential champions for health: Characteristics and position within social networks

Table 10 displays the alters with the top five brokerage roles in each case study. Brokers are defined as actors who inhabit a bridging position within a network which allows them to send and receive information or other resources between otherwise disconnected parts of the network (Burt, 1992). The Wellbeing Leads' networks from Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) showed that these were the only schools in which the Head Teacher played a main brokerage role in health improvement. In terms of Structural Hole Theory, this suggests that such a brokerage role will allow the Head Teacher to experience alternative points of view and facilitate the flow of resources, such as information about wellbeing throughout the school (Burt, 2004b). In Oakwood School there were 22 cliques (see Figures 12 and 13), compared to 19 in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) (see Figures 8 and 9), 14 in Highbridge School (see Figures 10 and 11) and six in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) (see Figures 6 and 7). A clique is a subset of three or more alters who are all connected to one another, where no other alter is connected to all of the clique members (Wasserman & Faust, 1994). Cliques may indicate the presence of a small shared group setting in which more than two people interact.

Table 10 Top five scores for betweenness centrality within each of the Wellbeing Leads' ego networks (excluding students)

Betweenness Centrality		**Highest Scores**
Greenfield School	1	Assistant Head (Wellbeing and Safeguarding)(98)
	2	Assistant Head (PSE Line Manager) (71)
	3	Student Support Team (LSAs) (27)
	4	Learning and Wellbeing Department Manager (26)
	=5	Head of PE, Parent-student Support and Head of Student Support (17)
Woodlands School	1	Assistant Head 3 (126)
	2	Deputy Head 1 (87)
	3	All year groups (74)
	4	Assistant Head 4 (45)
	5	Girls' PE Teacher (36)
Highbridge School	=1	Head Teacher (74)
	=1	Safeguarding Officer (74)
	=1	Wellbeing Manager (74)
	=2	All other alters (0)
Oakwood School	1	Heads of Year (23)
	2	School Nurse (20)
	3	Additional Learning Needs Coordinator (15)
	4	Deputy Head (10)
	5	Head Teacher (7)

6.2.3 Ego network characteristics for Greenfield School's Wellbeing Lead

In Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3), the Assistant Heads for Wellbeing and PSE had the highest brokerage scores, indicating that these actors may facilitate the flow of information and good ideas between the two sections of the network relating to wellbeing and PSE (Burt, 2004b). The presence of a small group setting in one section of the network is demonstrated by the fact that the Assistant Head for Wellbeing is engaged in several cliques, mainly with non-teaching staff with dedicated wellbeing roles. Meanwhile the Assistant Head for PSE engaged in several dyadic ties with teaching staff. This suggests one-to-one settings or interactions, which may elicit information exchange with little collective consultation. The fact that Greenfield School was working towards the National Quality Award, the highest accolade in the Healthy Schools Scheme, appeared incongruent with the lack of collective consultation or team structure within their network. Visual representations are displayed in Figures 7 and 8 whilst a list of alters or individuals in the network is shown in Table 11. The key for the visual representations is displayed in Figure 6 below.

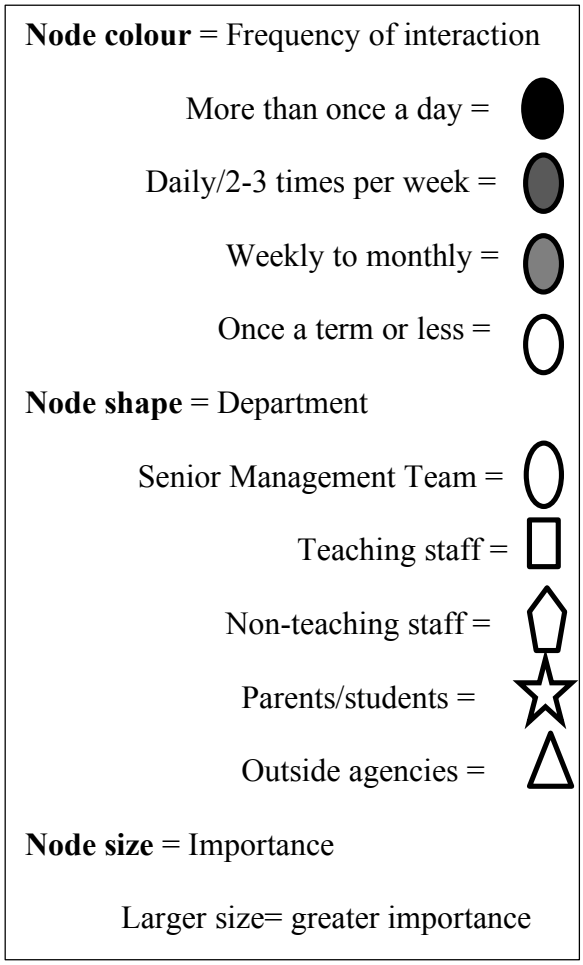


Figure 6 Key for Wellbeing Lead's ego network diagrams

Table 11 Job role key for Greenfield School net-maps

Node number	Job role	Node number	Job role
1	Assistant Head (Wellbeing and Safeguarding)	**11**	Learning and Wellbeing Department Manager
2	Assistant Head (PSE)	**12**	Learning Support Assistant (LSA)
3	Head of Student Support	**13**	Student Support Team (LSAs)
4	Head of PE	**14**	Canteen Manager
5	PE Teacher	**15**	Parent Forum
6	Head of Food Technology	**16**	Anti-bullying Team
7	Head of Science	**17**	Wellbeing Committee
8	Head of RE	**18**	Transition Key Worker
9	Science Teacher	**19**	Link Governor
10	Parent/Student Support	**20**	Healthy Schools Coordinator

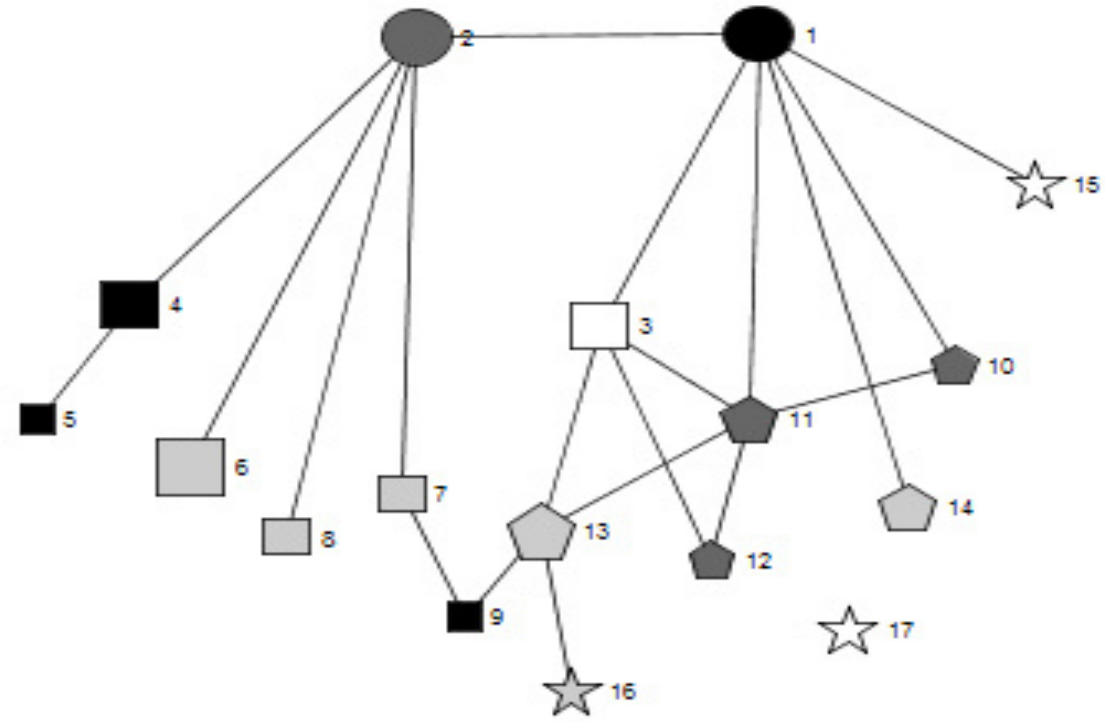


Figure 7 Net-map of Wellbeing Lead's ego network for Greenfield School (excluding outside agencies)

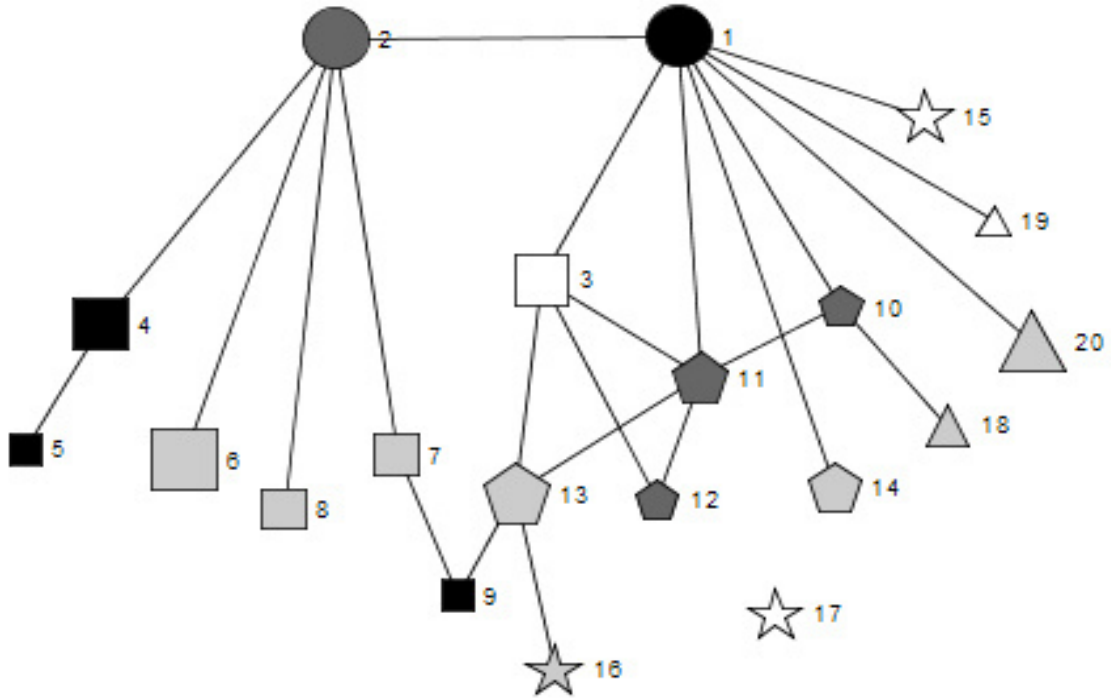


Figure 8 Net-map of Wellbeing Lead's ego network for Greenfield School

6.2.4 Ego network characteristics for Woodlands School's Wellbeing Lead

Despite also reporting large number of ties in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) and the Assistant Head and Deputy Head having the highest betweenness centrality scores, cliques were mainly comprised of homogenous groups, such as members of the SMT, with limited connections and brokerage between them (Burt, 2004b). The fact that Woodlands School had the least developed team structure is congruent with the fact that they had only reached the initial stage of the Healthy Schools Scheme. Visual representations are displayed in Figures 9 and 10, whilst a list of alters or individuals in the network is shown in Table 12.

Node number	Job Role	Node number	Job Role
1	Head Teacher	**17**	Canteen staff (x14)
2	Assistant Head 1	**18**	Dining Room Assistants
3	Assistant Head 2	**19**	Learning Support Assistants
4	Assistant Head 3	**20**	School Council Members
5	Assistant Head 4	**21**	All parents
6	Deputy Head 1	**22**	All year groups
7	Deputy Head 2	**23**	Governing Body
8	Heads of Year (x5)	**24**	School Nurses (x2)
9	Science Teacher/Student Voice	**25**	Drug Aid
10	Food Technology Teacher	**26**	Social Services
11	Girls' PE Teacher	**27**	Child and Adolescent Mental Health Services (CAMHS)
12	PE Head of Department	**28**	Mind (mental health charity)
13	PE Teacher	**29**	Shelter Cymru
14	Office staff (x6)	**30**	Safer Area
15	Caretakers	**31**	Healthy Schools Coordinator
16	Cleaners		

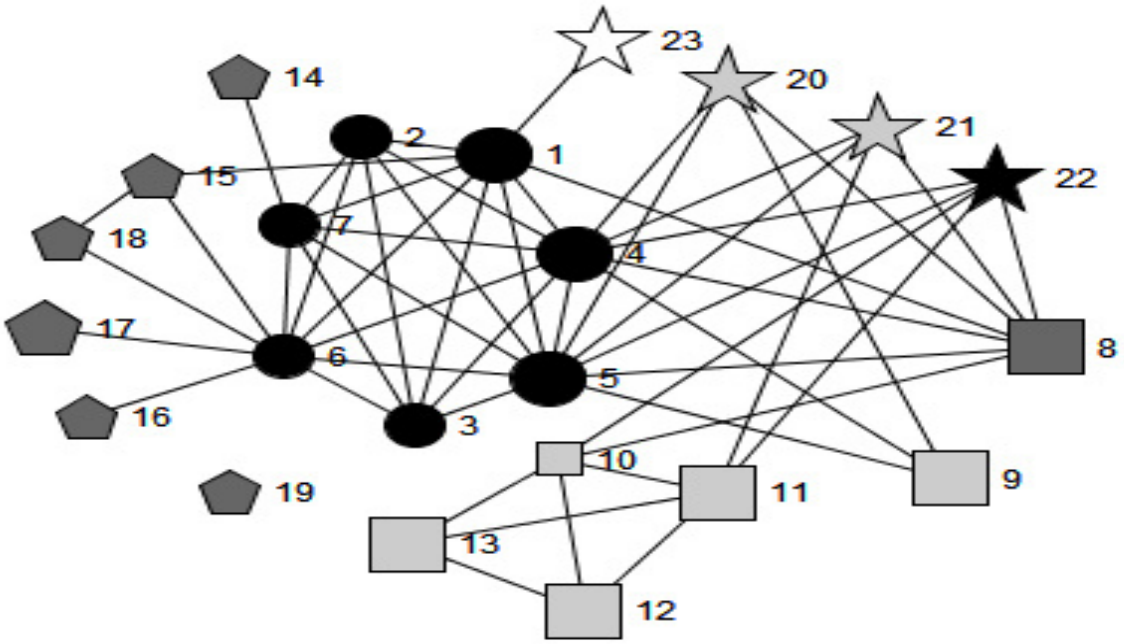


Table 12 Job role key for Woodlands School net-maps

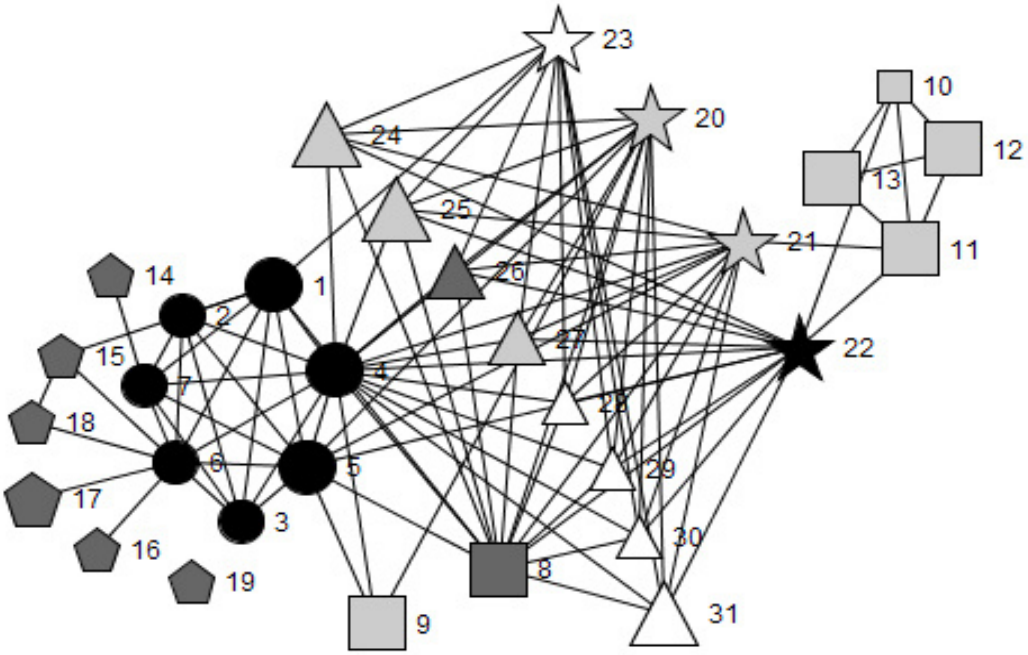


Figure 9 Net-map of Wellbeing Lead's ego network for Woodlands School (excluding outside agencies)

Figure 10 Net-map of Wellbeing Lead's ego network for Woodlands School

6.2.5 Ego network characteristics for Highbridge School's Wellbeing Lead

In contrast, within Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), members of the core health and wellbeing group were present within most cliques, had the highest betweenness centrality scores and acted as brokers between all other alters in the network, including outside agencies. This highly organised team structure is congruent with the fact that Highbridge School had achieved the National Quality Award, the highest accolade of the Healthy Schools Scheme and may facilitate collaboration and the efficient flow of wellbeing-related resources throughout the school and between the school and related systems (Burt, 2004b). Visual representations are displayed in Figures 11 and 12 whilst a list of alters or individuals in the network is shown in Table 13.

Table 13 Job role key for Highbridge School net-maps

Node number	Job role	Node number	Job role
1	Chair of Governors	**14**	School Nurse
2	Safeguarding Officer	**15**	Teaching Assistants
3	Head Teacher	**16**	All students
4	Deputy Head Teacher	**17**	All parents
5	Healthy Schools Coordinator	**18**	Promoting Inclusion Officer
6	All staff (daily meeting)	**19**	Women's Aid
7	All staff (bulletin)	**20**	SANDS (drug/alcohol misuse)
8	Healthy Living Team (multi-agency)	**21**	YAS clinic (sexual health)
9	Wellbeing Manager	**22**	NHS (many services)
10	Communities First staff	**23**	Team Around the Family (TAF)
11	Technicians (Science/Food/Art)	**24**	Social Services
12	Local doctor's surgery	**25**	Youth Service
13	Youth Workers		

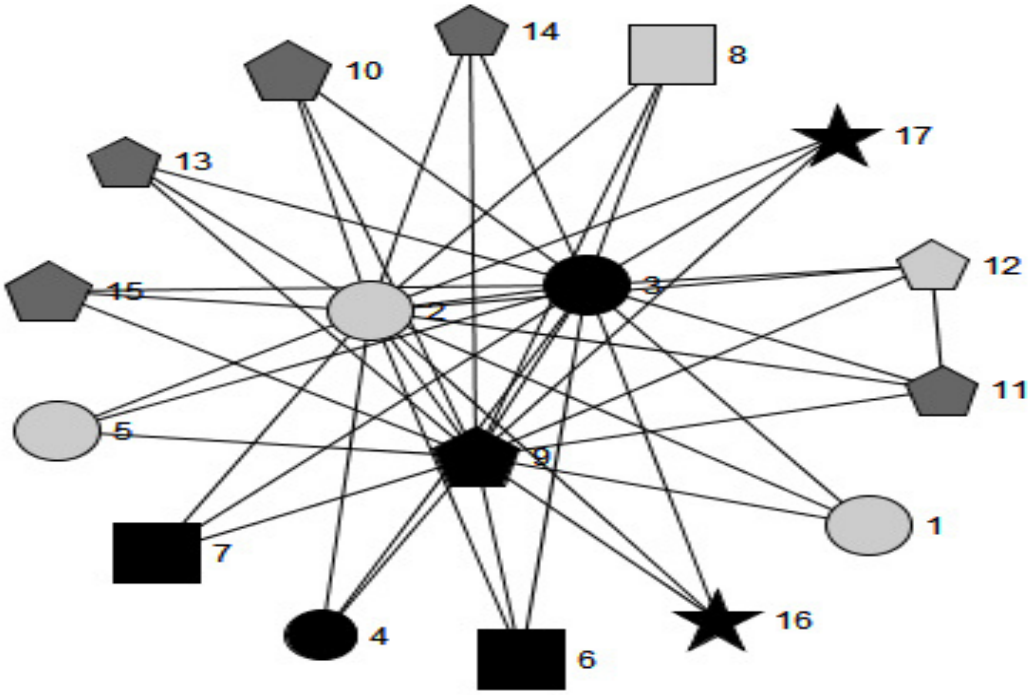


Figure 11 Net-map of the Wellbeing Lead's ego network for Highbridge School (excluding outside agencies)

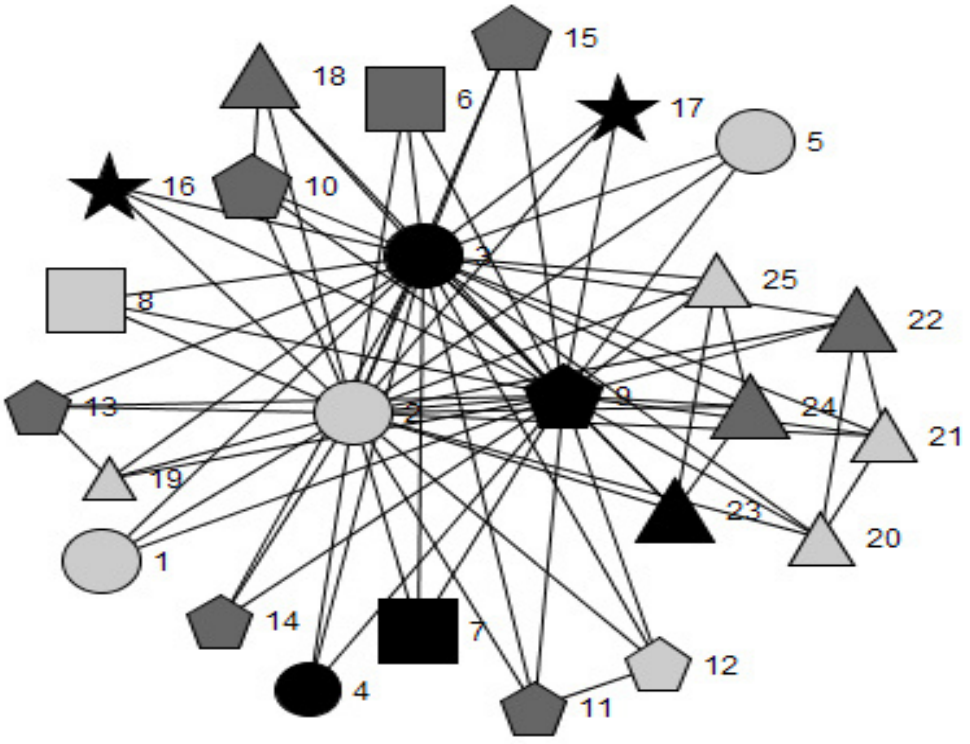


Figure 12 Net-map of the Wellbeing Lead's ego network for Highbridge School

6.2.6 Ego network characteristics for Oakwood School's Wellbeing Lead

A large number of ties were reported in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) and the Deputy Head and Head Teacher were included in the top five betweenness centralities. In addition to this, a limited team structure was evident with the following members of staff; Deputy Head, Heads of Year, School Nurse, Additional Learning Needs Coordinator and the Head of PSE. The Heads of Year and School Nurse had the highest betweenness centrality scores, suggesting a key role in facilitating health and wellbeing-related resources and information throughout the school, as well as the development of new ideas (Burt, 2004b). Oakwood School had the second highest level of engagement with SHRN, but was only on level 3 of the Healthy Schools Scheme. This is indicative of a school which seems to be aiming for reorientation towards health and wellbeing. Visual representations are displayed in Figures 13 and 14 whilst a list of alters or individuals in the network is shown in Table 14.

Table 14 Job role key for Oakwood School net-maps

Node number	Job Role	Node number	Job Role
1	Head Teacher	**17**	Parents
2	Deputy Head	**18**	Fire Service
3	Assistant Head 1	**19**	Barnardos
4	Assistant Head 2	**20**	Women's Aid
5	Assistant Head 3	**21**	Drug/alcohol agencies
6	Office Manager	**22**	Counsellor
7	All teaching staff	**23**	Young Carers
8	Head of PSE	**24**	Educational Welfare Officer
9	Additional Learning Needs Coordinator	**25**	Youth Offending Team
10	Heads of Year	**26**	School Health Nurse
11	School Nurse	**27**	Looked After Children Team
12	Non-teaching staff x35	**28**	Police
13	Speech/Language Support Officer	**29**	Inclusion Service
14	Emotional Literacy Support Assistant	**30**	Educational Psychologist
15	School Counsellor	**31**	Child and Adolescent Mental Health Service (CAMHS)
16	Students	**32**	Social Services

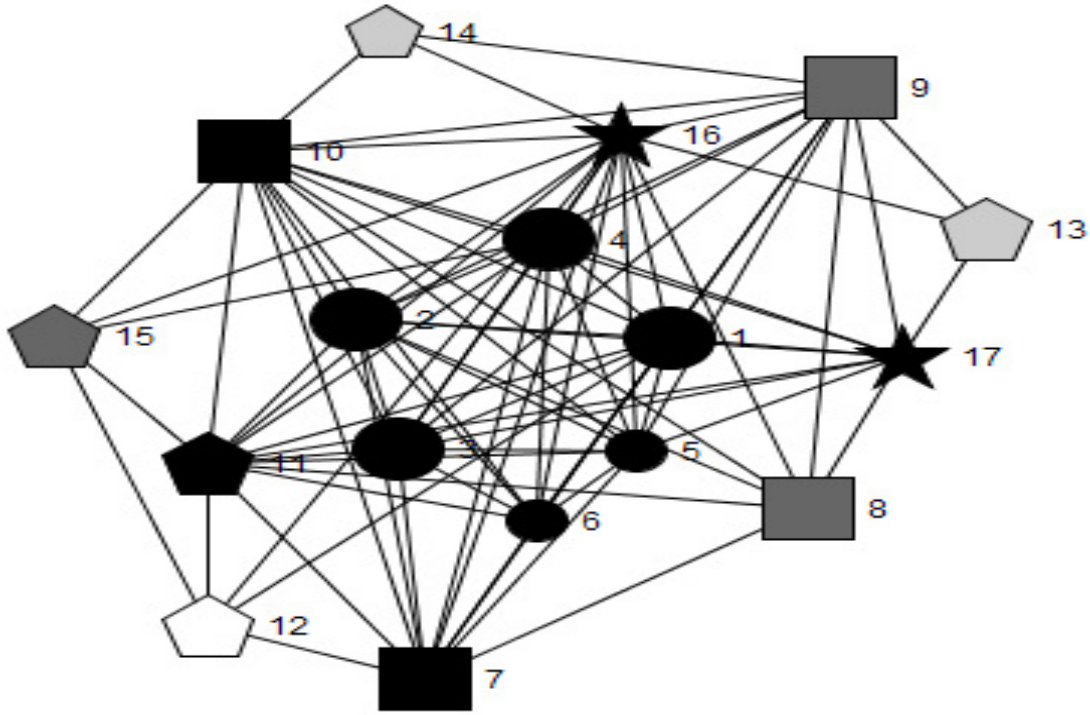


Figure 13 Net-map of Wellbeing Lead's ego network for Oakwood School (excluding outside agencies)

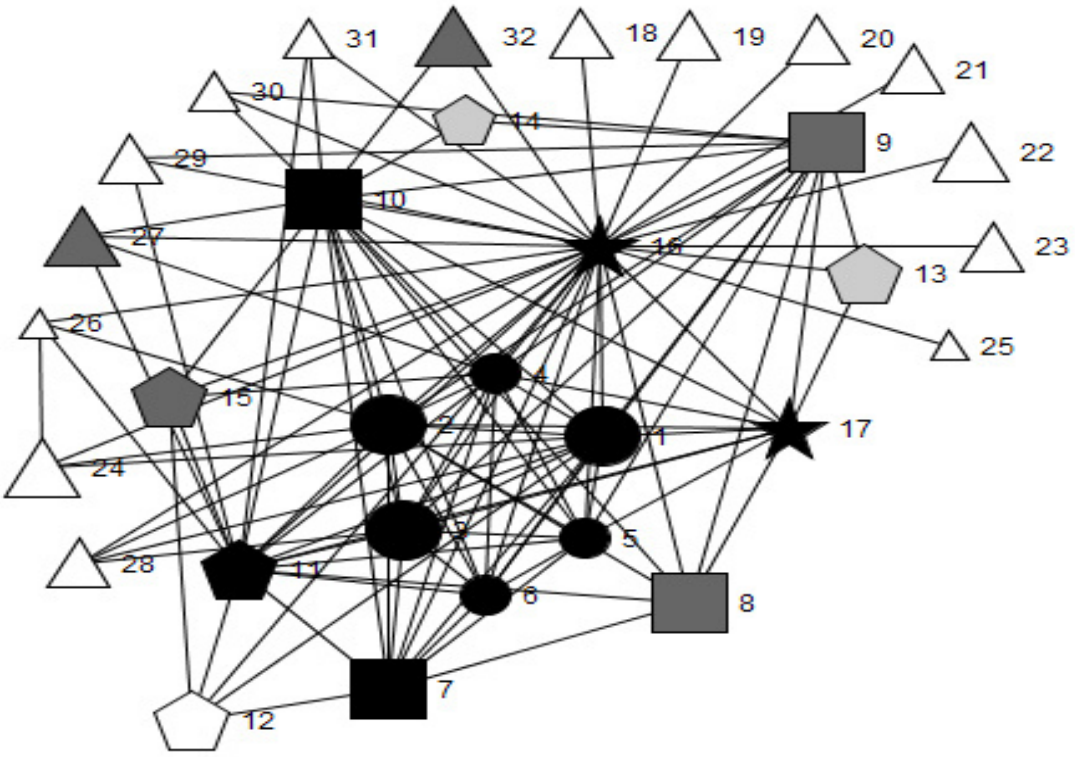


Figure 14 Net-map of Wellbeing Lead's ego network for Oakwood School

6.2.7 Overview of outside agency and senior management support within ego networks

Outside agencies were highly embedded within Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), to the extent that four outside agencies were labelled as non-teaching staff because they were co-located on the school premises. In Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) outside agencies were connected to two Assistant Heads and the Heads of Year, suggesting that collaboration with, and brokerage for, outside agencies is shared among several members of staff (see Figure 10). In contrast, in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3), outside agencies do not appear to play a large role in school health (see Figure 8). Meanwhile, whilst many outside agencies were included within the Wellbeing Lead's ego network in Oakwood School, many were solely linked to students, with eight outside agencies being linked to one to three other members of staff, including Heads of Year, Deputy Head, Head Teacher, School Nurse and School Counsellor. This suggests that the Wellbeing Lead plays the main brokerage role between the school and outside agencies (Burt, 2004b). Where brokerage and a high level of collaboration with outside agencies exists new ideas may be brought in from outside and influence system functioning in terms of wellbeing (Burt, 2004b).

SMT support for health improvement varied by case study, with only two members of the SMT reported to be within the Wellbeing Lead's ego network in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3). Notably, this excluded the Head Teacher and Deputy Head Teacher, with neither interacting directly with the Wellbeing Lead about health improvement. Therefore, whilst Table 9 shows that the Wellbeing Lead from Greenfield School reported the highest percentage of extremely important interactions with the SMT (100.0%), it is notable that the most senior roles (Deputy Head and Head Teacher) are not included. Despite reporting lower percentages of extremely important interactions with SMT members, overall Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) Schools reported a higher number of interactions with SMT members regarding health. Moreover, within Highbridge and, to a lesser extent, Oakwood School, a Head

Teacher or Deputy Head was reported to be involved in brokerage between the school and outside agencies.

In contrast to Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3), Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) reported no extremely important interactions with SMT members (see Table 9). This may be explained by the fact that, although all SMT members interacted with the Wellbeing Lead in Woodlands School, they formed a homogenous clique with few interactions regarding health improvement with individuals outside of the SMT. In Oakwood School, however, all members of the SMT interacted with each other as well as several other members of staff, students and parents and some outside agencies. This suggests the presence of a small team structure in Oakwood School, although the extent to which this is embedded throughout the whole school is unclear. Highbridge School showed a completely different wellbeing structure, with a core group formed of the Head Teacher and the Safeguarding Officer (who are both part of the SMT) and the Wellbeing Manager (who is a member of non-teaching staff). There were also three members of the SMT outside of this group, including the Healthy Schools coordinator. This shows that non-teaching staff and outside agencies to have the authority to influence decisions within this school. Notably, within Highbridge School, the SMT are also reported to interact directly with all staff about health improvement at daily staff meetings. This indicates the presence of a comprehensive team structure.

6.2.8 Key differences between Wellbeing Leads' ego networks between case study schools

In summary, key differences between case study schools relate to the extent to which SMT members play brokerage roles, the frequency and perceived importance of interactions with other key agents with regards to health, the number of roles relating to health, and the embeddedness of outside agencies into school systems. These differences appeared to map on to variability observed in Chapter 5 in terms of engagement with SHRN. For example, in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), the Head Teacher played a key brokerage role, a core senior group with responsibility for health and wellbeing was clearly

linked to all other cliques and actors within the network, and there was a high degree of embeddedness of outside agents. This represented a social network in which, after the removal of any one individual, all cliques would remain linked to the core wellbeing group. In contrast, in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) the Assistant Head played the most central brokerage role and only reported links with three outside agencies, while key actors responsible for health were largely linked to other individuals via dyadic ties. This network appeared substantially more fragile, in that the absence of one or two individuals would remove the only pathways through which key groups and individuals were linked to one another.

6.3 Qualitative perceptions of school structure

The following sections will elaborate on the quantitative descriptions of staff social networks described above, through qualitative investigation of the internal and external structures (the structural context of action within and outside of the school gates) which support school health, and their variability between case study schools. The section will draw upon data from semi-structured interviews with case study school staff. The duality of structure and agency will also be discussed, through acknowledging that they are mutually constitutive as opposed to separate entities (Stones, 2005). The role of individual members of staff in both reproducing and changing these structures will be considered, as well as the effect of both internal and external structures (the structural context of action within and outside of the school gates) on the behaviour of agents within the system, such as their level of communication and collaboration.

As discussed in Chapters 2 and 5, the terminology used for Stones' Strong Structuration Theory (Stones, 2005) within this thesis will differentiate between internal and external structures (the structural context of action within and outside of the school gates), whilst the intrinsic factors within an agent comprise the general dispositions of each individual combined with their conjuncturally-specific knowledge. Conjuncturally-specific knowledge is defined as knowledge of the strategic terrain and comprises of the following three aspects: interpretive schemas or structures of signification; normative expectations or structures of legitimation;

and the capacity to mobilise authority and/or resources or structures of domination. This theory is used to frame the analysis and discussion of organisational processes to support health and wellbeing within the school system. Data are described below regarding the allocation of responsibility for leading health and wellbeing, the presence of wider leadership models within the school and its repercussions for the commitment of senior management, the systematisation of health-related roles and the role of students in the delivery of health improvement. The extent to which these factors may recursively affect structure and agency and the orientation of the school system towards health are discussed. Moreover, the link between school structures and level of engagement with SHRN are considered.

6.3.1 Distribution of leadership across schools

Allocation of responsibility for leading health and wellbeing

Allocating the role of Wellbeing Lead to a member of the SMT was perceived to be important to ensure that the internal school structure, (i.e. the social positions within a school associated with identity and action that are connected through social networks), was conducive to health improvement (Stones, 2005). Because of the dynamic nature of complex systems, individual agents (e.g. staff) are continuously leaving and being replaced (Keshavarz et al., 2010). Thus, if a system prioritises wellbeing and allocates this role to a member of the SMT, they are likely to impact the internal structure (the structural context of action within the school gates) and intrinsic factors (general dispositions and knowledge of how they should act) among agents within the system to a higher degree. This impact could be shown in terms of influencing the rules and informal ethos of the school that may directly or indirectly affect health, and by being able to put monitoring and feedback structures into place (Keshavarz et al., 2010; Stones, 2005). The need for Wellbeing Leads to mobilise authority in order to respond quickly to changes in policies of suprasystems was highlighted by some participants.

> *"I think having [name] who is the Deputy Head and our Inclusion and Wellbeing Officer,* ***the fact that that's from that level at the senior management level****. She drives this wellbeing ethos in our school (…)" Oakwood School, School Nurse*

> *"I do think it does because **it [coming from senior management] gives it a level of importance**, which I think it needs and it's not brushed off as another initiative that we have to be doing (…)" Woodlands School, Food Technology Teacher*

Thus, this suggests that when the role of Wellbeing Lead is allocated to a member of the SMT, the internal structures (the structural context of action within the school gates) support this mobilisation of authority due to their increased influence in the school. The importance of placing this role within the SMT is supported by the social network findings from Section 6.2. The Head Teacher was included in the top five betweenness centrality scores (see Table 10) for Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) Schools, where the role of Wellbeing Lead had been allocated to a Deputy Head. Moreover, the Deputy Head had the second highest betweenness score in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2), where the role of Wellbeing Lead had been allocated to an Assistant Head. Whereas, in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3), where a PE Teacher had been allocated the role of Wellbeing Lead, Assistant Head Teachers had the highest betweenness scores. This suggests a higher level of access to key decision-makers within the school when the role of Wellbeing Lead is allocated within the SMT, which, according to Structural Hole Theory, may result in the development of social capital and good ideas in relation to health and wellbeing (Burt, 2004b). This may influence system functioning through an improved efficiency in information flow, alongside having the seniority to implement these new ideas.

Participants highlighted that the Wellbeing Lead is required to make important decisions quickly, delegate tasks, deal with outside agencies and remove children from classes for appointments with outside agencies. Therefore, the high level of influence and authority associated with SMT membership was perceived to facilitate this.

"The Wellbeing Lead has to be part of the Senior Management Team because the Wellbeing Lead could never ever just be a middle manager because ***huge decisions have to be made and it's got to be pushed right from the top down****, definitely. I have no qualms about that (…)" Oakwood School, Wellbeing Lead*

Roles within the SMT are associated with power, respect and responsibility, which affects the health-related practice of staff within the school (Odhiambo & Hii, 2012). For example, the position of the Wellbeing Lead (an internal structure or the structural context of action within the school gates) was described by some as affecting how other agents within the system exerted their active agency. This may result in the Wellbeing Lead making health and wellbeing-related changes within the school, and to other members of staff internalising the rules set and actions undertaken by them. This could stimulate them to change their actions accordingly.

The Healthy Schools Coordinator working with Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) supported the argument that the role of Wellbeing Lead should be allocated to Senior Management as she perceived the SMT to have a greater influence over eliciting action from other agents within the school.

"I think in terms of influence in school, policies and things that schools get involved in then yes I think that does have an influence, because generally if someone is saying 'this is a good thing to do' ***then it's more likely to have an impact if it's someone in the Senior Management Team****, than it is if it's someone who is just an ordinary teacher, generally." Greenfield, Healthy Schools Coordinator*

The length of service of these Wellbeing Leads was also proposed to have an effect on their authority and level of embeddedness within the school setting, with the Wellbeing Leads in Woodlands (engagement rank 3, education rank 4, embeddedness rank 2), Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood School (engagement rank 2, education rank 3,

embeddedness rank 4) all having worked in the school for over 25 years and all being part of the SMT. Indeed, serving for a long time in one school may improve an agent's knowledge of the structural terrain and, therefore, allow them to make decisions on how to act whilst minimising the risk of unintended consequences (Stones, 2005).

This is consistent with the findings from the social network analysis in section 6.2 which showed either Head or Deputy Head Teachers to play a key brokerage role in all case study schools apart from Greenfield School, whose Wellbeing lead had the shortest length of service. This is also supported by the size of the Wellbeing Leads' ego networks, with Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) only having 20 nodes, two of which were members of the SMT, compared to a range of 25-32 nodes within the other Wellbeing Leads' networks. Moreover, educational research has demonstrated a link between length of tenure and teachers' perception of community with staff but not with students (Royal & Rossi, 1999). The Head of Science and Student Voice in Woodlands School stated that the long tenure of the Wellbeing Lead had resulted in a high level of authority.

> *"Whereas [Wellbeing Lead], having been here for a very long time and have, being a member of the Senior Leadership Team it does mean that* ***she has got that status that means that people, if she says 'right you need to do this', then people are going to listen and do that.*** *You know and she can say 'right well I need evidence for that' and people are aware of that and they need to show that they are meeting servicing targets. So yeah, it does make a difference, definitely." Woodlands School, Head of Science and student voice*

By contrast, teaching staff with seniority and power within their own departments, but who were not members of SMT, were perceived to have limited impact on the school system as a whole, outside of these subsystems (Keshavarz et al., 2010). This is possibly due to structural holes that are not bridged by brokers between departmental cliques (Burt, 2004b). This is supported by the ego net-maps in Sections 6.2.3-6.2.6, which showed that Heads of Department tended to interact with

members of the SMT but often not with agents within other departments. For example, the Head of Science and Student Voice in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) expressed a perceived difficulty of exerting influence outside of her own department.

> *"because she is part of the Senior Management Team and this is something that goes school wide, that's very important because* ***even for myself as a Head of Department it's easy for me to make sure things are in place in my department, but if I go out of my department to say 'Oh can you do this, can you do that', it's very, it's difficult*** *for, not that I'm not respected because I am respected but it's difficult for me to get people to make sure they do things that I would want them to do if you know what I mean." Woodlands School, Head of Science and Student Voice*

This demonstrates the potential role of brokerage between cliques in facilitating information flow and influencing system functioning (Burt, 2004b). This perception of the importance of the allocation of the role of Wellbeing Lead to the SMT was maintained by most, despite some staff acknowledging that individuals in the SMT have more demands on their time. Some suggested that, although the authority to make decisions and change the system is perceived as an important factor in allocation of the role of Wellbeing Lead, the ability to delegate tasks and leadership across several more junior members of staff was crucial to exerting agency and was seen as a more realistic way of understanding school improvement. This is opposed to the reliance on strong leadership of one heroic individual, such as the Head Teacher, whose time and resources are spread thinly across all aspects of school life (Timperley, 2005).

This distributed leadership, whereby the main Wellbeing Lead role is allocated to a member of the SMT, creates a model of a 'team structure' in which there is both a clear overview of health improvement, but where specific roles are delegated among actors within the system, with ties between these various agents and groups (Timperley, 2005). The development of such management structures and the

subsequent well-organised mechanisms to support the flow of information between and within sub-systems throughout the school relates to the conceptualisation of schools as CASs and may facilitate the embeddedness of health and wellbeing within these (Keshavarz et al., 2010). This is best demonstrated by Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) whose Wellbeing Lead's ego network was structured with a core group consisting of the Wellbeing Lead, Wellbeing Manager, Safeguarding Officer and Head Teacher (see Figures 11 and 12), who all had the highest betweenness centrality scores and interacted with other non-teaching staff with wellbeing-related roles. Highbridge School was also the school with the highest level of engagement with SHRN.

Distributed leadership was shown on a smaller scale in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4), which had the second highest level of engagement with SHRN reported in Chapter 5. While most schools have a Local Authority employed School Nurse who is not based at the school, Oakwood School had a full time School Nurse. The Wellbeing Lead reported frequent interaction with the School Nurse and PSE Teacher and rated these as important, thus constituting a small team structure. However, the PSE Teacher did not have a high betweenness centrality score as her interaction with other members of staff was limited. This suggests that the wellbeing team were not as embedded in the school.

There was not universal agreement regarding whether allocating the role within SMT was inherently a more effective model. For example, a Teaching Assistant from Highbridge School articulated that, because of the high workload on the SMT, allocating the role of Wellbeing Lead to a member of staff with more time to dedicate to the role may be more beneficial.

> *"The only thing I would say is she has got so many roles. She is Deputy Head Teacher so of course there is a lot of,* ***there is a lot of pressure on her*** *isn't it? And there is a lot of jobs that come under her job description so maybe (…)* ***it would be beneficial to have one person without all these other jobs to see to, to be you***

***know solely dedicated**, that would obviously got to be a positive, you know?" Highbridge school, Teaching Assistant*

A similar view was expressed by an Assistant Head Teacher in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3), where the role of Wellbeing Lead was allocated to a PE Teacher, who was not a member of the SMT. The Assistant Head Teacher in this school, which had the lowest level of engagement with SHRN, was not convinced that the allocation of the role of Wellbeing Lead to Senior Management would equate to more authority within the school. He argued that the benefit would actually be obtained by the allocation to a more junior member of staff who could dedicate more resources to that specific role.

*"You could argue that but what you're talking about is differences in people rather than processes or structures because you can put it with whoever you want, **it depends on the person to see it through**. And you could argue that it's the other way, that the higher up the institution you go in terms of roles, if they become wider and more spread out then actually it would fall along say five or six other roles which people may see as more important in their daily run. So I think it's actually a real positive of where it's sat at the moment, you know in line with, in line with Heads of Departments as well because and because **it becomes that person's primary driver and therefore it probably has more effects than it being part of wider job brief higher up I think**." Greenfield School, Assistant Head for PSE*

However, according to the results showing that influence of teaching staff outside of their specific departments and that brokerage between departments can be limited, this may have implications for the orientation of school systems towards health and wellbeing (Burt, 2004b). A possible method of overcoming this could be combining allocation of overall responsibility for decisions regarding health and wellbeing to a senior member of staff, but who supports the junior member of teaching staff in their day to day work. The emphasis on individual agency and free choice to 'see it through' may demonstrate a naivety regarding the level of power that teachers outside the SMT have to exert their agency over the whole school system as they may face independent structures that are outside of their control, such as the

development of health-related policies (Stones, 2005). Irresistible structures, which are structures that are amenable to control but are perceived as uncontrollable by agents, may also inhibit the enactment of health-related agency of teachers due to their perception of not being able to exert power over other members of staff (Stones, 2005).

A distributed leadership model could be perceived to be in place in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3). However, the role of Assistant Head for Wellbeing was included within the Wellbeing Lead's ego network. Thus, this may be an example of too much responsibility being allocated to a junior member of staff and the figurehead for wellbeing (the Assistant Head), not being senior enough to affect system change sufficiently. This is supported by the Healthy Schools Coordinator who reported that, although she interacted with both the Wellbeing Lead and the Assistant Head for Wellbeing, her primary point of contact and gatekeeper for school health was the Wellbeing Lead, who was a junior member of staff.

Although the Assistant Head for Wellbeing was reported to be involved in aspects of social and emotional wellbeing, the Wellbeing Lead also presented evidence that the Assistant Head for Wellbeing did not have the time in her job role to focus on health and wellbeing, thus supporting the need to delegate to more junior staff.

> *"(…) so these people would speak to this person a lot. She speaks to everyone basically, she like runs the school [Assistant Head for Wellbeing]" Greenfield School, Wellbeing Lead*

The potential benefit of allocating the role of Wellbeing Lead to a more junior member of staff is further supported by the Wellbeing Lead from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2), who had the role of Assistant Head. She reported that, given the number of roles she was undertaking, it was difficult to prioritise health and wellbeing. This demonstrates that the ability of school staff to exert their agency could be facilitated by both having time to dedicate

to wellbeing and being given support and authority by proxy to take action regarding health and wellbeing. This, in turn, could affect the school structure by increasing the changes made regarding health and wellbeing, e.g. implementation of mechanisms for student voice and creating meetings or action groups to tackle health and wellbeing issues. This type of distributed leadership, where teachers are empowered within their area of expertise, has been shown to maximise human capacity within the organisation and improve student outcomes (Silins & Mulford, 2002). This is contrary to the ego network reported by the Wellbeing Lead in Woodlands School in section 6.2.4, which shows that there are few non-teaching staff with dedicated wellbeing roles and no clear team structure to support her.

Wider Leadership Models

According to Stones (2005), a comprehensive team structure is important within the duality of structure. Here, a comprehensive team structure refers to the extent to which health-related roles are embedded in the school system. Within the case studies, this was generally perceived by school staff to be a further important characteristic for creating a school system that is conducive to health improvement. School Wellbeing Teams were reported to comprise several non-teaching staff with dedicated wellbeing roles.

The Wellbeing Lead from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) reported that the difficulty prioritising health and wellbeing may be due to the minimal team structure for wellbeing within that school. The Science Teacher/Head of Student Voice for Woodlands School also argued that it is important to have one lead individual with overall responsibility for wellbeing in order for progress to be made.

> *"I think it's important that we've got one person leading it so that someone takes overall responsibility for it and then can make sure that it is fed down through the school to other people. Because* ***I think if you had a lot people being responsible for it, no one takes overall responsibility and it doesn't move on****." Woodlands School, Science Teacher/Head of Student Voice*

This was supported by the PSE Teacher from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4), albeit with an important caveat. She emphasised the importance of the SMT providing authority by proxy alongside delegated responsibility. This reinforces the importance of distributed responsibility, as discussed in the previous section, for wellbeing issues to be communicated throughout the school. It also helps to increase the capacity of actors to mobilise resources for enacting agency to improve wellbeing, whilst highlighting the need for one person to take responsibility and oversee this delegation to ensure that action is taken.

> *"Absolutely, I couldn't do my job if it wasn't for the fact that I had a member of senior team who, sometimes she will say, 'I don't necessarily understand, but go for it', or she hasn't necessarily got the time because of her other, the other demands of her job. But* ***I know I have her support, and I know that she trusts me and she will back me up.*** *Because even my gut, if I've got some instincts about something she [the Deputy head Teacher/Wellbeing Lead] will say just go for it but keep her informed." Oakwood School, PSE Teacher*

It may be that a combination of the authority held by the SMT combined with delegation to and collaboration with the other members of staff around them could present a way to optimise the creation of a healthy school system (Timperley, 2005).

In contrast to this, the Wellbeing Lead in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) was not only outside of the SMT but also had little insight into the process by which wellbeing issues were taken forward within the SMT. They had no direct health and wellbeing-related communication with any SMT members apart from two Assistant Heads, one of whom had been allocated responsibility for wellbeing. Therefore, they relied on the most junior members of the SMT to take wellbeing issues forward to SMT meetings in order for action to be taken. This lack of support demonstrates that it may not be the allocation

of the role of Wellbeing Lead to the SMT which is important, but indeed the presence of support for the role from the SMT.

Indeed, previous research findings investigating school commitment to health support this, showing that the full support of an SMT who were committed to health was related to the quantity of health improvement activity delivered in schools (Moore et al., 2016). The Wellbeing Lead for Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) described a desire for direct communication with the Head Teacher, thus demonstrating that she did not perceive this support to be in place.

> *"Obviously **the Head Teacher is a very busy man**. I do speak to him if there's something like when we had our Healthy Schools Assessment, obviously I spoke to him and if there's something I usually I wouldn't necessarily (…). **It would be good to have a specific, like allocated time for that maybe but, I don't think that's going to happen**, but it would be good and I know that these two people [the Assistant Heads], they have an SMT [Senior Management Team] meeting every Monday so anything that I've probably discussed in my meetings with them they probably then go and take on" Greenfield School, Wellbeing Lead*

The comprehensive team structure within Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), as described above, may have been developed in a response to a high level of need, due to this being the most deprived case study school with >40% FSM entitlement..

> *"We've got some heavy demands on pastoral care within the school so we've got a dedicated team for each year group which includes a Pastoral Support Assistant who'll look out for the health and wellbeing of each child in their year group." Highbridge School, Wellbeing Lead*

Moreover, it was evident that school staff in all case study schools perceived a need for more than one individual to be working on health and wellbeing.

> *"I think they need more you know I think like one person, but then they have got like I said people branching off her that deal with different sections and different problems that may arise." Highbridge School, Teaching Assistant*

> *"**we've got our core [group] and then we've got our Healthy Living** Team which, I've put there. **This is a team which leads off from that so the Wellbeing Manager and myself direct the meeting for that**, so we've got one next week. They're multi, they would be multi agency, so that will be Teachers, Teaching Assistants, it'll be guest speakers from outside, from the NHS, our School Nurse, our 5x60 Officer, drugs and alcohol, etcetera" Highbridge School, Wellbeing Lead*

Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2), whose net-maps demonstrated a more fragmented system suggested that much of the health improvement agenda was driven solely by and was highly dependent upon the Wellbeing Lead Assistant Head Teacher. This was perceived to be a limiting factor for school health improvement by both the Wellbeing Lead herself and other members of staff within the school, including the PE and Food Technology Teachers. All staff who were interviewed in Woodlands School expressed a desire for a team structure to be developed and perceived the current structure to not only be unsustainable, but also ineffective, due to the limited agentic ability of a solo member of staff to initiate and sustain change within a large organisation (Stones, 2005).

> *"**it might be an idea that we have a team.** I know that there was a team last year but I'm not sure because a different member of staff, [name] she was here a number of years ago, and she had people who were part of the Healthy Schools, just maybe, you know it's something I would like to do (…)" Woodlands School, PE Teacher*

In contrast, the Science Teacher/Head of Student Voice from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) felt that having one Wellbeing Lead within the SMT with sole responsibility for school wellbeing was sufficient and that 'too many chefs spoil the broth'. Comparisons were made by the Wellbeing Lead in Woodlands School to primary schools, where it was perceived to be much easier to create a team structure, due to the smaller school size.

> *"(…) in a primary school, and one person can hold the responsibility and see it through to the end. I'm the only person here and to liaise with all the staff and all the parents and all the students, it's difficult" Woodlands School, Wellbeing Lead*

The Food Technology Teacher within Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) also highlighted the role of internal structures (the structural context of action within the school gates (Stones, 2005)), such as geography of the school, in facilitating collaboration and teamwork. Geographical proximity may also have implications in terms of brokerage and the facilitation of information flow and the development of ideas regarding health and wellbeing (Burt, 2004b). Woodlands School had recently relocated separate upper and lower school sites to one single site.

> *"(…) we were on two sites last year and the gap was even bigger and [Wellbeing Lead], who's in charge of it, was down the lower school a lot and when you're in one school it is difficult to meet up with people as often.* ***Now that we're on one site I find collaboration is much easier*** *so perhaps it's something now that we'll develop further." Woodlands School, Food Technology Teacher*

Suggestions were also made with regards to building a team structure through the creation of Professional Learning Communities and helping to prioritise wellbeing within the school, thus putting structures in place to facilitate the expression of staff

agency with the view to improving the implementation of health and wellbeing-related actions.

> *"certainly a network within school primarily because I feel overwhelmed.* ***I do feel overwhelmed. I've got great colleagues but everybody's so busy and everybody's got their own job descriptions, their own priorities*** *and even within my own role it falls into a pocket sometimes and it's not,* ***it hasn't got the priority on a day to day basis*** *so it really should have more time certainly, possibly a PLC, a Professional Learning Community, with that at its heart so that it's really put at the top of the agenda for the school" Woodlands school, Wellbeing Lead*

The importance of the formalisation of a teamwork structure, whereby other agents in the system are aware of the presence and related roles and structures and formal leadership is in place to support it, was also emphasised. This may facilitate the allocation of tasks and information flow and brokerage (Burt, 2004b) between individuals and departments within the team, the ability of team members to implement health and wellbeing-related actions or policies (Keshavarz et al., 2010) and may also contribute to the sustainability of the team structure if key individuals were to leave.

> *"I know we've got a network of people that do work on it but perhaps make that structure,* ***put that structure in place so it's a little bit more rigid so you know who is in charge of what area*** *might be beneficial." Woodlands School, Food Technology Teacher*

This is supported by LeGreco et al. (2011), who found that communication was key to sustainable policy and public health practice implementation in schools.

6.3.2 Systematisation of non-teaching health and wellbeing-related roles within the school-system

Whilst the above section focused on the need for a leader within the SMT combined with a team structure, or a distributed leadership model, the current section will discuss the roles of individual members of non-teaching staff in more detail. The provision of staff who have health and wellbeing written into their job roles may facilitate the alteration of agents' intrinsic factors (general dispositions and knowledge of how they should act). For example, actions for health and wellbeing improvement may be enhanced through contributing to the creation of normative expectations around the delivery of such actions. This could also increase the capacity of individuals, who are often in non-teaching roles dedicated to wellbeing and who are likely to not be in positions of power, to mobilise resources to undertake these actions (Stones, 2005).

The provision of time and space within non-teaching job roles to deal with wellbeing issues play a major enabling role within this. A teacher's main job role is to educate, thus time is a scarce resource in an environment where they are already overcommitted with teaching responsibilities and wellbeing is unlikely to be prioritised. From a complexity perspective, this may help to create an additional sub-system to work alongside the traditional departments and year groups. The fact that these individuals will have more time to dedicate to wellbeing, may help to improve the visibility of health and wellbeing in the school system and communication between subsystems (Keshavarz et al., 2010).

> *"**The main strengths of the Wellbeing Department is that our staff, so as part of the wellbeing Department**, as well as what you'd expect to be part of a Wellbeing, (…) so Learning Support Assistants and you know our SENCO, there's also as part of that team we have Learning Coaches, Heads of Year are also part of that team, I'm part of the team as well and we have our Behaviour Support Leader who's part of that team and because **everybody comes together, everybody always talks about any issues**." Greenfield School, Wellbeing Lead*

In particular, staff from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), especially the Wellbeing Lead, consistent with her ego network, highlighted that their team structure was used as a model for other schools to aspire to. The comprehensive team structure involved a Wellbeing Department and several non-teaching staff with wellbeing-related responsibilities written into their roles. This was developed further by having a core group and a multi-agency Healthy Living Team. Staff also commented on how the presence of a non-teaching pastoral team may help to increase the time and expertise available to deal with any wellbeing issues that arise for the students. A team structure may also facilitate information flow throughout the school staff and between the school and other systems, such as parents and outside agencies, so that all staff are aware of any issues (Keshavarz et al., 2010).

> *"(…) we have a lot of schools come in to us here to try and remodel what we have in other schools and it's sort of cottoned on that* ***you have to have that solid team for it to work in every school*** *really, do you know what I mean? To identify the issues and to work with them. Obviously* ***if you haven't got that type of team then it's really hard for that teaching member of staff, time-wise, to be able to address all those type of issues****." Highbridge School, Wellbeing Lead*

As discussed in the previous section, within Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) the Assistant Head acted as a lone figurehead, whilst the Wellbeing Lead, School Nurse and PSE Teacher worked as a small team structure in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4), as illustrated in their ego networks in sections 6.2.4 and 6.2.6. This brings into question the sustainability of structures which are highly reliant on one or two individuals, rather than being embedded and systematised; if one champion were to leave the school, it may pose difficulties for maintaining health improvement activities.

Ultimately system capacity is required to increase the replicability and sustainability of such health improvement structures (Keshavarz et al., 2010). Heward et al. (2007)

argue that this capacity can be built through the inclusion of health improvement within the organisation's core business and subsequent organisational change, alongside provision of support for staff to change their practice. This system level capacity or structure could lead to an increased capacity for individuals to exert their agency within their particular job roles due to senior management and system-wide support facilitating the orientation of the strategic terrain (e.g. structures of signification, legitimation and domination) towards health and wellbeing improvement. This is supported by Zimmerman et al.'s (1998) defininiton of CASs as 'a collection of individual agents, who have the freedom to act in ways that are not always totally predictable, and whose actions are interconnected such that one agent's actions changes the context for other agents'.

A school-employed full-time School Nurse discussed how she fitted into Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) by collaborating with other teaching and non-teaching staff. Within her key brokerage role, as reported in section 6.2.2, the School Nurse also reported improving the mechanisms for information flow throughout the school by sharing her overview of wellbeing data for all children in the school with other members of staff (Keshavarz et al., 2010). Thus this may facilitate the flow of resources throughout the school (Burt, 2004b), and subsequently impact upon the enactment of agency to deal with health and wellbeing issues (Stones, 2005). This is however perhaps an example of reliance on an individual member of staff, who works with the Wellbeing Lead and dedicated PSE Teacher.

> *"Yeah so and then I have a lot to do with the PSE department so I am visible during lessons and we reinforce each other's messages" Oakwood School, School Nurse*

> *"So all I can tell you is that I have data, that we have the highest attendance in the whole of [name of location]. I like to believe that that has in the last three or four years with differences,* ***you can see that go up it's since I've been employed. I'm very aware that that's not just me, as I said, we're in a team****." Oakwood School, School Nurse*

Despite the School Nurse's positive perceptions of team working within Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4), this is contrary to the results of the social network analysis presented in section 6.2.6. The ego net-maps identified a small team of three key players, the Wellbeing Lead, School Nurse and PSE Teacher, but no clear wellbeing team structure beyond this. Moreover, although the School Nurse was highly embedded in the system with reported ties to most staff as well parents, students and some outside agencies, the PSE Teacher was reported to have limited ties with other school staff. This suggests a small team structure, with limited communication throughout the school system.

6.3.3 Student engagement with health and wellbeing roles and processes

This section will draw upon semi-structured interview data from case study school staff, students and parents to discuss the extent to which students interact with teaching staff and non-teaching staff in relation to health and wellbeing processes. These are important factors in increasing school connectedness and prioritising wellbeing within the school system, according to the Theory of Human Functioning (Markham & Aveyard, 2003).

Interactions with teaching staff

Students in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2), who had the least non-teaching staff dedicated to wellbeing, mainly reported that teaching staff dealt with any issues that they had, with somewhat mixed perceptions of effectiveness. For example, a Year 11 girl reported that teaching staff liaised effectively with her mother in order to sort out a bullying issue.

> *"Yes I think they should, when I went through a bullying issue with the school before* ***my Mam rang up the school and they communicated really well*** *like my Mam explained the situation and what was going on, and* ***the school sorted it straight away****." Woodlands School, Student interview 4, Year 10 boy and Year 11 girl*

Moreover, Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) created space during break time to allow Heads of Year to deal with concerns

that the students raise immediately. This constituted an internal structure (the structural context of action within the school gates) according to Strong structuration theory (Stones, 2005). Each year group was assigned to a block where the Head of Year was based at break time with an open door policy, so students were able to discuss any issues there and then, so they were 'nipped in the bud' rather than being allowed to escalate. This may also serve as an example of positive feedback loops between staff and students, whereby student feedback enables the school wellbeing environment to improve (Keshavarz et al., 2010).

> *"There are six classrooms there where children are registered and then every lunch time and break time the Head of Year works in her office, or she is patrolling the corridor. Right, so the children* ***if there are any issues, it's nipped in the bud****. Same, you know, every block has an area, a designated area for the children and I think it is good because they can approach, because sometimes they just go in for a chat to see the teacher, sometimes they go in for a reason and it's very discreet and I think* ***a lot of bullying and things is dealt with immediately as opposed to dwelling on it,*** *ok." Oakwood School, Wellbeing Lead*

This was also supported by students from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) who stated that they felt more comfortable approaching their Head of Year because they didn't have to mix with older children to do so. This hence contributed to the breakdown of barriers between teachers and students and increased students' potential for the realisation of the capacity for affiliation (Markham & Aveyard, 2003). Such open relationship-building between students and teachers where students view teachers as approachable was shown to be important in students' satisfaction with school, and subsequently connectedness and health outcomes (Samdal, Nutbeam, Wold & Kannas, 1998).

Year 9 students from Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) also suggested that all teaching staff were approachable and Year 9 students from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) suggested that the option was there for whoever students felt

most comfortable approaching, pastoral or teaching staff. Thus, this further facilitated the enactment of agency among students due to the plethora of members of staff to approach.

> *"Yeah **if a student has a problem all the teachers will make sure that they'll be able to help** it, even if they're not in the wellbeing office, teachers in general."*
> *Greenfield School, Student interview 2, Year 9 girls*

> *"Yeah I think and **you can go to whoever you feel comfortable with** so you if you're more comfortable with one teacher you can go to them instead of someone else."*
> *Highbridge School, Student interview 2, Year 9 girls*

The emphasis on teachers being approachable supports Markham and Aveyard's Theory of Health Promoting Schools which theorises that dedicated health improvement activities and staff are not required. They drive a focus on building open relationships between teachers and students as well as creating a separate wellbeing structure (Markham & Aveyard, 2003). In contrast, these results as a whole show that the prominence of wellbeing relies on the provision of staffing structures which include a team of non-teaching staff in the school who can work alongside teaching staff to provide the time and space to deal with issues immediately and build trust and rapport with students.

This is supported by an evaluation of the MindMatters whole school mental health intervention which raised the issue of a tension between teachers' core role of educating students and a health professional's aim of delivering mental health support (Wyn, Cahill, Holdsworth, Rowling & Carson, 2000). Thus, the authors argue that training teachers to be supportive to mental health can help this to become an integral part of school functioning, as opposed to 'doing' mental health education with an expert in an isolated time and space within the school (Wyn et al., 2000).

Interactions with non-teaching staff

Many students from Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) and Highbridge (engagement rank 1, education rank 1,

embeddedness rank 1) Schools emphasised that the wellbeing team or pastoral staff were instrumental in dealing with their health and wellbeing related issues.

> *"it's really good because **I've used the Wellbeing Office and they're really helpful and supportive** and they won't let the issue go until it's all sorted and especially the ones that are big, that are really important." Greenfield School, Student interview 2, Year 9 girls*

> *"(…) like if you're upset you can just go see your pastoral person of your year and they will sort it out." Highbridge School, Student interview 1, Year 9 boys*

This view was supported by staff in these schools, with the Wellbeing Lead from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) even stating that the pastoral team go the extra mile by travelling to families' homes to deal with any issues.

> *"(…) we've got two people sat on a wellbeing desk who see the children if there are any issues they liaise with parents and then back to Head of Years and so on (…)" Greenfield School, Student Support Manager*

> *"You see, the Pastoral Team is big **so I've just sent out, for example, two of our Wellbeing Team down to a family who's in need at the moment** and, you know two children on the child protection register. So we work with the family in the home, as well as in school." Highbridge School, Wellbeing Lead*

Parents also supported this, with a parent from Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) who also worked in the school reporting that they have a strong wellbeing team dedicated to ensuring that students are emotionally well. Moreover, many parents, who also worked at Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), reported that they had a strong pastoral team which stands out against other schools. Moreover, they perceived most children to feel comfortable approaching staff with problems.

"(…) not lots of schools have such a solid wellbeing team that's sole focus is on making sure that the children are ok." Greenfield School, Parent interview 1, Female, Member of staff, Learning Support Assistant

"(…) ***we've got like a Wellbeing Manager and which I don't know any other schools who have got things like that*** *you know* ***the pastoral care and the wellbeing of the children is amazing in this school****, compared to other schools with different parents and what they're kids have you know our school stands out in that aspect (…)" Highbridge School, Parent interview 3, Female, Member of staff, Lead Learning Coach*

The provision of dedicated space for wellbeing constitutes an internal structure (the structural context of action within the school gates) according to Strong Structuration Theory (Stones, 2005). It facilitates the promotion of wellbeing within the school system, providing a fixed space where young people can go at any time. The provision of resources through internal structures (the structural context of action within the school gates) may also facilitate the enactment of agency due to staff's job roles being guided towards a focus on pastoral care (Stones, 2005). The Wellbeing Lead in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) perceived their wellbeing department to be particularly effective due to the small size of their school. A smaller size may act as an internal structure (the structural context of action within the school gates) to facilitate the provision of support for all students by the wellbeing team (Stones, 2005).

"I think the strength of our school is that, for one, ***we're quite a small school really so that most staff know most children*** *and certainly the wellbeing team,* ***the new wellbeing team have got a massive overview of every child*** *really in the school." Greenfield School, Wellbeing Lead*

A smaller school size was perceived to be advantageous both in terms of providing individual care to all students and efficiency and ease of communication between staff and subsystems. This was compared to a larger school size, which was perceived as a barrier to communicating with all students and parents in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2). Despite this, Greenfield School was categorised as having the lowest level of engagement with SHRN in Chapter 5.

Students from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) spoke of their pastoral offices for lower and upper school, which they would approach with a problem according to which year group they were in.

> *"Yeah that's a good because **if we're not comfortable talking to a teacher or parent we'll always have, well we have someone else to go to like another student** but that's older and has more experience in school." Greenfield School, Student interview 1, Year 8 boys*

> *"S1: Yeah you would either go down to like 'A' floor which is you have the office there. S2: This floor as well. Yeah do you know the office out there? That's yeah. S1: Yeah or **you could go up to 'C' floor and that's where [Pastoral Support Officer] and [Pastoral Support Officer]'s office is and one of them are always there**." Highbridge School, Student interview 3, Year 8 girls*

The Wellbeing Lead from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) also stated that they had between five and seven members of staff dedicated to pastoral, emotional and wellbeing support and can deal with issues in a timely fashion, but no specified wellbeing department.

> *"**There's five, six, seven members of staff here who are literally for the pastoral, emotional and wellbeing support of the students**, which can tick so many boxes and they can be referred for so many reasons, but we would have somebody who*

could pick up on anything, you know. Whatever the issue was, somebody would be able to run with it." Woodlands School, Wellbeing Lead

This was contrary to the views of students in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) and indeed the Wellbeing Lead's ego network, which did not include any pastoral staff.

Staff in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) particularly emphasised the role of the School Nurse in comparison to other schools. As mentioned earlier in the chapter, whereas most schools have a Local Authority employed School Nurse who is not based in the school, Oakwood School had a full time School Nurse. The Nurse stated that she sees a minimum of 10 students per day and that being based at the school allows children to get to know her, thus increasing the likelihood that they will confide in her.

"So my role being based in the school is to really it's health promotion, number one. It's to teach the kids how to cope or deal with every day ailments you know headaches, period pain, all of those things. It's very much safeguarding because I am here, ***I know the children, they know and trust me and I have this fixed base so they know that every single day I'm going to be here.****" Oakwood School, School Nurse*

"The fundamental of this role is that you are based in the school because bottom line is ***if children do not know you, they will not tell you anything****." Oakwood School, School Nurse*

The School Nurse was reported by students to deal with a lot of issues single-handedly and was trusted to keep things confidential unless it was necessary to involve other staff members, such as the Head of Year.

"S1: she [School Nurse] deals with it herself 99% of the time S2: ***she won't like tell anyone else our problems****, she'll just keep it to herself, unless it's really bad, then she'll just tell our Head of Year." Oakwood School, Student interview 4, Year 7 and Year 11 boys*

This was supported by students within three out of four interviews who perceived the provision of a full time School Nurse to be a privilege that other schools do not benefit from. They also emphasised her role in managing illness and specific medical issues as well as someone to approach with any issues. The provision of physical space for wellbeing could increase awareness of dedicated staff and services within the school, thus incorporating them more fully into the school system. This could possibly lead to the improvement of norms around accessing the services and reorienting the school system towards health and wellbeing (Keshavarz et al., 2010).

The School Nurse featured heavily in parent interviews in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4). They perceived the School Nurse to be helpful in identifying issues and one parent perceived the provision of this role to be unique to their school. They also stated that they felt students could talk to the nurse about many issues when they would be too embarrassed to talk to their parents, thus providing someone for their children to confide in and approach for help.

"Well I think it is unique because I didn't realise they're the only comprehensive in our area that has a nurse there." Oakwood School, Parent interview 1, Female, Not a member of staff

"(…) ***some children can't talk at home, so they've got somebody then at school*** *that they can go to by having a nurse or anyone in the department they feel that they can go and see somebody else." Oakwood School, Parent interview 2, Female, Not a member of staff*

Meanwhile a student from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) reported that confiding in the PSE Teacher or Heads of Year allowed them to deal with issues before students came to any serious harm.

> *"Say now somebody's really depressed and they don't talk about their feelings, they can have a mental breakdown in class and the teachers don't know what it's about, but* ***if they go to the counsellor or [Head of Year] or [PSE Teacher] they sort it out before anything happens****, like self-harming, like " Oakwood School, Student interview 1, Year 7 and Year 11 boy*

> *"Well* ***our PSE teacher said that if we have any problems with like emotional, then we can come and talk to her*** *because she is qualified to listen to us and give us advice." Oakwood School, Year 7 boys*

They also articulated that the School Nurse's office and the PSE Teacher's classroom was a physical space where students knew they could go for help.

The need to get to know children in order to identify problems was echoed by the Wellbeing Lead in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1). This highlights the role of relationship-building by non-teaching staff in identifying problems and referring students quickly to the relevant outside agencies, if required.

> *"(…)* ***having individual staff who have the personal attention to detail with each child*** *so that they can involve the multi-agencies that are required to make sure that that person, you know, is safe and certainly looked after within the family and in the school" Highbridge School, Wellbeing Lead*

Whilst the PE Teacher from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) stated that those in the Pastoral Team were more likely to know personal details about the students and be able to identify problems.

"I think if you're in the pastoral team you are more aware of their background, their family life, their health, their situation you know you get to know if they're eating properly." Woodlands School, PE Teacher

This highlights the role of the creation of internal structures (the structural context of action within the school gates) in affecting both teacher and student perceptions of the strategic terrain in terms of norms, power and meaning. This may facilitate the enactment of agency in terms of teachers taking action due to, for example, having the power and resources to do so within their job role. It can also facilitate the students in seeking help due to knowing who to approach and it becoming the 'norm' in the school.

6.3.4 Involving students in the delivery of health improvement activity in schools

This section will explore further networks and relationships within the school system itself by focusing on the mechanisms for student voice and the communication between staff and students. The results of the ego social network analysis, outlined in sections 6.2.3-6.2.6, showed that Woodlands (engagement rank 3, education rank 4, embeddedness rank 2), Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) Schools all reported that 100.0% of their interactions with students were extremely important, compared to 0.0% reported by Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3), the school with the lowest level of engagement with SHRN. This will be further explored and contrasted with qualitative data from semi-structured interviews with case study staff, students and parents below.

Mechanisms for student voice

Staff in all schools felt that it was important to create mechanisms for student voice in order to understand students' needs. Article 12 of the United Nations Convention for the Rights of the Child argues that children should have the right to have their

opinions taken into account when decisions are being made which affect them (Unicef, 1989), and in line with mandatory requirements, all schools reported the presence of a student council, whilst they varied more in the mechanisms and structures that they put in place to capture representative student voice outside of this. However, there was less variation within this area compared with the staffing structures and wellbeing structures and processes. These mechanisms may alter the intrinsic factors (general dispositions and knowledge of how they should act) of individual agents by changing the power structures between teachers and students (Stones, 2005), thus increasing communication between these subsystems, which may in turn help to ensure that the health improvement mechanisms within school are perceived as relevant and appropriate by students.

> *"It's just generally making that child as happy as they can be while they're in school and safe and having that voice." Highbridge School, Wellbeing Manager*

> *"I think it's probably most important really, because I think sometimes professionals, teachers we think we know, but* ***it's hard to know what's going on in the mind of a teenager*** *particularly and they see things that you don't see and they're experiencing it so they have better insight into the things that are affecting their health, the things that are affecting their friendship groups, things that need changing within the school." Greenfield School, Healthy Schools Coordinator*

From the perspective of the Theory of Health Promoting Schools and Human Functioning, this may help to erode boundaries between staff and students and improve students' capacity for practical reasoning. This may increase the likelihood that students can understand multiple realities through providing them with greater insight into both staff's and each other's realities. This, in turn, may increase students' ability to fulfil their capacity for affiliation (Markham & Aveyard, 2003). However, only one parent from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) expressed that students may feel more connected to the school if they feel they are listened to. This was not discussed by parents in the other case study schools.

"(…) ***Because if they are listened to then they are more likely to you know respect things that they've asked for or want****, and they're more likely to ask again and feel like they are being listened to (…)" Woodlands School, Parent interview 2, Female, Member of staff, role unknown*

Perceptions of staff and students in all four case study schools were mixed in terms of the representativeness of the student council. For example, the Wellbeing Lead in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) felt that certain minorities were not included, such as those who were wheelchair bound. This was contradicted by the Head of Student Voice and members of staff from other schools who felt that their election process did not result in just the typically engaged students, and produced a representative student council. However, this may be due to social desirability bias, whereby the Head of Student Voice has a vested interest in presenting student voice mechanisms as successful (Grimm, 2010).

"(…) I said, 'well wouldn't it be nice to have, because we've quite a number of children who have life-limiting diseases here, some ***wheelchair bound children, wouldn't it be nice to have their perspective on the school council' and they [students] really hadn't thought about that****." Woodlands School, Wellbeing Lead and Assistant Head*

"(…) they cover the cross section of children that we have, I mean there is massive push now for free school meals in terms of PDG grants and so on at the moment isn't there you know and ***I think a voice is heard for all of those, yes, all of those children*** *I think so." Greenfield School, Student Support Manager*

"(…) ***quite often they're seen as being like the elite etcetera but we do get a full range of students****. Some of the students when I see their name come through I think oh no, when they get to my meetings we'll see what we get out of them. Some of them are in the bottom sets of the class, we've got a couple who are in the special needs classes. We do get representation from all the different, children of*

different ethnicities in the meetings. And they are voted by their peers so you know we don't have any control over who they nominate, who they vote in." Woodlands School, Head of Student Voice and Science Teacher

Students within some of the case study schools, particularly Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) and Oakwood (engagement rank 2, education rank 3, embeddedness rank 4), also challenged the view that student councils were representative of the whole school, arguing that these often excluded more 'difficult' students and those who are shy or disinterested in such a process. These were the schools who reported the least comprehensive student voice mechanisms.

"(…) Maybe they are people who tend to achieve better in class maybe, academically. ***Maybe the top 3% of people in the school who achieve the best****, but what about the people who don't, or people who don't want to be on the school council? (…)" Oakwood School, Student interview 2, Year 8 boys*

"Yeah I do think that it is quite, I think that if you haven't got popularity and ***if you haven't got many friends, you wouldn't be on the school council****." Woodlands School, Student interview 4, Year 10 boy and Year 11 girl*

"(…) a girl I knew in my class, ***she had this reputation of being a bit naughty and the whole class voted her as student councillor****. Now the teachers gave her a chance and they said that* ***she couldn't do it because she wasn't taking it seriously enough****. (…)" Woodlands School, Student interview 4, Year 10 boy and Year 11 girl*

Although all schools reported having student council, it is important that these are inclusive for all students. This is especially true for hard-to-reach students who may be more susceptible to becoming 'alienated' or 'detached' from the school and may be less connected to the values of the regulatory and/or instructional orders (Markham & Aveyard, 2003). Within student voice, those who possess 'cultural capital', mainly those outside of socioeconomically deprived groups, are often

privileged as they are likely to communicate using language that is closely aligned to the schools' habitus (Bourdieu, 1977). Thus, this demonstrates a need for schools to reflect on the process of student voice to ensure that it is meaningful and inclusive (Robinson & Taylor, 2007). This is especially important to ensure that inequalities are not exacerbated through aligning school's practices even more closely with individuals from the culturally dominant majority.

Schools reported the presence of multiple mechanisms to maximise the number of voices heard. These mechanisms included talking to minority groups, conducting surveys, subject-specific feedback through surveys, school council and focus groups. Thus, whilst many felt that the election process into the school council resulted in a representative group and reported that everyone had the chance to feed into this, schools had moved beyond traditional mechanisms in an effort to be more inclusive and to try and achieve representation of the whole student body. This demonstrates that school staff, especially those in wellbeing and senior roles within Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) and Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) Schools, perceived inclusivity as important, which constitutes intrinsic factors (general dispositions and knowledge of how they should act) outlined by Strong structuration Theory (Stones, 2005). This also shows that it may be important to have a wide range of internal structures (the structural context of action within the school gates) in order to facilitate the enactment of agency for all students within the school, and subsequently align health improvement activities with students' needs.

> *"(…) as part of the PSE programme we run online Survey Monkey questionnaires on a whole variety of fields so we'll run through the full ESTYN questions." Greenfield School, Assistant Head for PSE*

Staff in Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) and Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) Schools also reported that subject-specific mechanisms for feedback during PSE were in place. The pertinence of such mechanisms is supported by a student survey which

showed that only 15% of students reported having been asked for their views by the student council members (Whitty & Wisby, 2007), thus highlighting the need for other mechanisms to capture an inclusive range of voices within the school.

> *"At the end of each topic we have a feedback form and they tell us what they thought of the course. So I do think in this school we do take the time to do that student voice." Woodlands School, Food Technology Teacher*

The idea of anonymity may be important to students in order for all ideas to be considered with minimal bias and to increase students' confidence in putting forward their ideas. For example, Year 8 boys from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) and Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) reported that their schools carry out student voice surveys, both for the whole school and to gain anonymous subject-specific insight.

> *"(…) sometimes we do **whole school surveys** where like we go on the computers and then there's questions that we answer. And then like the head staff like look over and see what we've said." Highbridge School, Student interview 4, Year 8 boys*

> *"Yeah they don't ask your name or anything like that [during survey], they just ask you your year and your gender and then **it's very confidential so if you have a problem you won't get asked about it but you know it will get sorted**, in complete confidentiality." Greenfield School, Student interview 1, Year 8 boys*

Students highlighted the importance of confidential opportunities for everyone to input their ideas to the school council. For example, a few students in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) reported that they had a suggestions box in their school, which helped to ensure that ideas could be put forward anonymously. Students in Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) and Highbridge (engagement rank 1, education rank 1,

embeddedness rank 1) Schools reported that they did not currently have a suggestion box, but suggested that one should be implemented.

Mechanisms for student voice related specifically to health and wellbeing

Both Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) and Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) staff reported better than average student voice mechanisms, with Greenfield School having a Wellbeing Committee as a separate arm of their school council to focus on wellbeing issues alongside a School Nutrition Action Group and an Anti-Bullying Team made up of Sixth Formers who younger students could approach. Whilst Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) described 'sector-leading' student voice, no elements specifically relating to health were reported. Moreover, in Greenfield School the Wellbeing Lead only included students who were members of student voice groups. In addition to this, the PSE Teacher from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) reported that she held health-related student focus groups and the Head of Student Voice/Science Teacher in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) reported that she ran a Unicef Right Respecting School group, with relevance to health and wellbeing, in addition to a student council.

Staff in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) really emphasised the focus on wellbeing throughout their student voice, using their Wellbeing Committee to discuss topics such as bullying, smoking and canteen food and creating a separate School Nutrition Action Group to allow students to input into the food that the school canteen provides.

> *"(…) there's* ***the student voice they all sit down, they have offered some quite insightful ideas*** *into what they would like to see in the canteen and what things they'd like promoted and in terms of wellbeing, the amount of PE lessons they have and so on." Greenfield School, Student Support Manager*

"Again, the Anti-Bullying Team was design, not designed but we talked through with the Wellbeing Committee on what they think would be best so that came from that as well." Greenfield School, Wellbeing Lead

Despite this, students' perceptions of the focus on health within student voice in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) were mixed, and they seemed unaware of the Wellbeing Committee as a separate entity or internal structure (the structural context of action within the school gates) (Stones, 2005). The Head of Science/student voice in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) reported having a Unicef Rights Respecting School Award group, which focuses on providing citizens with rights, linked to things such as health and education. These internal structures facilitate the enactment of students' active agency for issues directly relating to health. This may also increase the number of 'committed' students, helping to increase their feelings of connectedness to the school and their perceptions of being able to affect changes within the school (Markham & Aveyard, 2003). This also promotes interactions between subsystems, thus increasing the level of embeddedness of health and wellbeing within the whole system (Keshavarz et al., 2010).

"(…) It's [the Rights Respecting School Award] about being a global citizen and it definitely links back into health." Woodlands School, Head of Science/student voice

Despite reports of these dedicated structures for health-related student voice in Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) and Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) Schools, reports from students in all schools, regarding their awareness of health issues being discussed within student voice, were mixed.

"Well not in the subject ones but in the council like you can talk about it [health]." Highbridge School, Student Interview 1, Year 9 boys

"S2: it's a bit of both, ***there is health-related things being spoke about but there are a lot of just general issues most of the time****.(…) S1: I think they do deal with everything, they do deal with safety, they do deal with the school and health" Oakwood School, Student Interview 4, Year 7 and Year 11 boy*

With regards to students in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2), the issue was only mentioned once, by Year 8 boys who reported that the school council mainly focused on the school environment and issues not directly related to health, and did not acknowledge the Rights Respecting School group.

"S1: No, not as much on the school council it's more of like school, things that the school could bring, like bring into the school like extra. S2: ***To make the school a better place, environment and stuff like that.****" Woodlands School, Student Interview 2, Year 8 boys*

Despite the mixed perceptions of the extent to which health was addressed within student voice, research shows that the school environment, as well as social relationships, could have a profound effect on student health behaviours (Moore et al., 2016). Thus, it may be that a direct focus on health is not always required for student voice to have health benefits. This is supported by Markham and Aveyard's Theory of Health Promoting Schools (Markham & Aveyard, 2003), which argues that a focus on human functioning, school organisation and pedagogic practice will lead to the realisation of two essential capacities of practical reasoning and affiliation, and subsequently improve health.

Making changes as a result of student voice

Staff and students from all case study schools reported that health-related changes had been made within the school as a result of student voice. There were some common themes across schools, which included hydration, canteen food, equipment and space for physical activity, changes to the curriculum and changes to the school environment, such as the provision of bins, benches and improving toilets to positively impact bullying and hygiene.

> *"we've also got what we call **Student Leader Groups and they're from each subject area** so you'll also have student sessions led by staff in different subjects and they have an influence. (…) each department does a subject development plan so the student voice have a section in the subject development plan to say how they've help to influence the choice of activity within a subject, which has been really interesting." Highbridge School, Wellbeing Lead*

> *"(…) one of the things that recently was highlighted about the water and water being available and I know that's something [School Nurse] has campaigned quite significantly on and **the students actually brought it through the school council that it was decided and now a water fountain has been put on**." Oakwood School, Learning Support Assistant*

Within the literature, student voice is often reported to vary between a tokenistic compilation of opinions and serious consultation which leads to changes in school policies and practice (Robinson & Taylor, 2007). An example of the latter comes from Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) and Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) Schools where new school buildings had just been constructed. It was reported that students were consulted and had significant input into the design of these.

> *"Water, people complained that there weren't too many places for clear water so they're going to be adding in water fountains in the new school build." Greenfield School, Student interview 1, Year 8 boys*

"And this new school was designed by the school council as well. Because with obviously with help but because our old school was nothing compared to this school really because it was years old." Highbridge School, Student interview 3, Year 8 girls

This was supported by staff. For example, the Wellbeing Lead from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) described how students shaped the design of the new school building as a result of multi-agency health meetings.

"We meet once every 6 weeks and that's a multi-agency meeting where everybody who's linked to health in the school comes to the meeting and we also invite the students as well so that they can direct the way that they want health to go. So ***the students were saying they wanted the water, so we had to take that back to the builders when they were building the school to say we want water fountains.*** *They wanted, open plan toilets, they didn't want the closed toilets that most schools have got and we now have multi-sex toilets (…)" Highbridge School, Wellbeing Lead*

The above are clear examples of how student voice structures can contribute to the reorientation of school systems towards health improvement. However, the way that some changes to hydration were implemented in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) was perceived as somewhat controversial. For example, a Year 12 girl challenged the fact that students were only allowed to drink from a bottle with the school logo on, and suggesting that this idea was mainly driven by a Deputy Head Teacher, rather than the student council.

"So like ***I think [Deputy Head] came up with the water bottle idea*** *and that was funded because the teachers weren't happy with us having our own bottles in class, but some of that still hasn't worked. Like sometimes you don't remember, you just buy a drink on the way to school, like a bottle of water and* ***you're still not allowed***

> ***that in class, which I think is a bit silly because if it's water, it's still ok, but it has to be in the school bottle.*** *" Oakwood School, Student interview 2, Year 12 girl*

This highlights that, although changes are made by senior management, they may not have the desired effect of improving school connectedness if not implemented in a manner consistent with the needs and desires of students in the school (Markham & Aveyard, 2003). Thus, this shows that student voice cannot simply be a symbolic process. Schools need to engage with students in a meaningful way, to ensure that they feel they are providing valuable input that is taken seriously, and that helps to shape the school environment. Furthermore, it may be important for schools to manage expectations regarding the role of student voice and the extent to which suggestions can be enacted.

Changes were perceived positively by most students, although there were examples of some expressing dissatisfaction. For example, a Year 10 boy from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) stated that improvements made to canteen food provision were insufficient. Again, this suggests that there are limits to the changes that schools are able to implement as a result of student voice, with a variety of different drivers of action. Thus, schools may need to manage student expectations.

> *"(…) it depends what the topic, issue, is really.* ***Like the school meals we used to have chicken burgers every day, they stopped that but people still wanted them so the students argued for it and now they have them every Monday*** *instead of all week, which is, it is healthier than having a chicken burger every day but* ***it's still not brilliant for their health.*** *" Woodlands School, Student interview 4, Year 10 boy, Year 11 girl*

In addition, this was debated by parents in Woodlands school (engagement rank 3, education rank 4, embeddedness rank 2) who were also members of staff. One parent reported that the canteen made changes as a result of suggestions from students,

whilst another reported that this was not the case and that the canteen food remained very unhealthy.

Moreover, the Science Teacher/ Student Voice Lead in Woodlands School, and the Food Technology Teacher in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3), stated that sometimes students make unfeasible suggestions regarding unhealthy changes to food and smoking policies. For example, a Year 10 boy expressed frustration that regressive changes in health practices, such as allowing older students to bring junk food onto site at lunch time, were not able to be implemented as a result of student voice. Whilst, within the same paired interview, a Year 11 girl disagreed with him.

> *"I think they should,* ***I think they should be allowed in with their food but I don't think that the vans should come here every day*** *so then the children can go out, get their food and eat a chicken popcorn baguette five days a week." Woodlands School, Student interview 4, Year 10 boy and Year 11 girl*

This demonstrates the difficulty of ensuring that each student has a voice, when some suggestions are not aligned with the policies and laws in place to protect student health and wellbeing.

Despite reports that many changes were implemented within case study schools as a result of student voice, some students conceded that it would not be possible to respond to all student suggestions. They felt it to be sufficient for schools to be perceived to be trying their best to attend to students' suggestions, if these changes would benefit the school, and if they were sensible. This suggests that perceived effort may increase the number of 'committed' students and improve the likelihood of fulfilling the essential capacities of affiliation and practical reasoning (Markham & Aveyard, 2003).

"But it's like if there is an issue in the school that needs to be addressed they will say it in the school council meeting and they will try their best to get it to be sorted out." Greenfield School, Student interview 2, Year 9 girls

"if like the students have a say like if I don't think that nothing stops it only if it's like a stupid idea or like that wouldn't benefit the whole school. They still suggest it but then the school would discuss like it would probably be more negatives than positives and ***then they would say 'Oh well what does everyone think about this idea' and then not put it up because it's not benefitting the school****." Highbridge School, Student interview 2, Year 9 girls*

One parent from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) also felt that suggestions must be reasonable in order for action to be taken.

"Whether things will be done, some things have been done you know so they do listen to the kids but I suppose it depends on what they were asking for within reason." Woodlands School, Parent interview 2, Female, Member of staff, Role unknown

Again, the perceived level of feasibility is not always clear cut. Whilst most students related to the lack of changes in some areas and identified with them, perceiving them as reasonable, some students perceived a lack of effort to implement changes.

"Say we put ideas forward for different sports in the school and that, I think the school find it a bit too much trouble to actually try and put it in place for us." Oakwood School, Student interview 4, Year 7 and Year 11 boy

"I think there's a school council, but they don't always listen and, even when there's a lot of you, they don't always listen because it's taken through the teachers

obviously, but it's still not, like we've had some suggestions for years that are still not" Highbridge School, Student interview 4, Year 8 boys

Although many of these perceptions may be unfounded, sometimes teachers sympathise with students' perspectives. For example, a member of staff in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) sympathised with a request from student voice for unsuitable and uncomfortable school PE kit to be changed, which had not been acted upon.

"(…) the Head of PE thinks it's great because you don't need to have tabards then if you've got different teams, they come on a different round. But the problem is because they're all polyester and long sleeve and ***they have to wear them all year round they get very sweaty in the summer, quite uncomfortable. So for many years the boys have been campaigning to change that****. (…)" Woodlands School, Science Teacher/Head of Student Voice*

Overall, these results show that structures surrounding student voice are integral to embedding health and wellbeing into the school system and making changes that are relevant and acceptable to students. However, challenges remain in engaging those students who are harder to reach, through both maximising the representativeness of the school council and moving beyond traditional mechanisms to capture voices of young people beyond those of the student council. Challenges also remain in ensuring that this is more than a symbolic process, and that firstly actions are taken, and that secondly these actions address, and are representative of, the suggestions arising from student voice. Moreover, student expectations may need to be managed to ensure an increased understanding of the likely effect of student voice. Robinson and Taylor (2007) theorise that the core values of student voice are communication, inclusivity, acknowledgement of power imbalance and the possibility for change.

Staff from Highbridge (engagement rank 1, education rank 1, embeddedness rank 1), Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) and

Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) Schools reported the inclusion of SMT members in student voice, which may help to ensure that feedback loops are in place, whereby action is taken from students' feedback and then further feedback is obtained, to ascertain whether these changes have improved the issues put forward by student voice groups. This may also serve to weaken the barriers between staff and students even further (Markham & Aveyard, 2003). Hence, by including SMT members within student voice groups, the internal structures (the structural context of action within the school gates) are being altered to further facilitate the enactment of students' active agency and increase their knowledge of the strategic terrain, particularly structures of domination, whereby students are able to mobilise authority and resources via the SMT. Moreover, this suggests that direct involvement of SMT within student voice mechanisms may be more effective, rather than reliance upon brokerage between agents involved within student voice and the SMT to elicit action (Burt, 2004b). This may also reflect the extent to which student voice is being used in a more genuine way, or as a tokenistic exercise.

> *"(…) there's about 20 students and they will come up with suggestions and they've got student voice leaders and then they will sort of take it back to our more senior members of staff then." Highbridge School, Behavioural Support Officer*

> *"(…) so there's two people per year group meet at the whole school council meeting and we also meet with the Headmistress and various other bodies who come in and want to speak to the students (…)" Woodlands School, Head of Science/student voice*

The importance of the role of the SMT in change initiation within the school system was echoed by a Year 9 girl in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2), who was reported by the Wellbeing Lead to be high achieving academically, but 'alienated' from the school. She suggested that students should be able to directly access a member of the SMT on a regular basis, to increase the likelihood that changes would be made.

"I suppose the only way you could change it maybe is getting students to meet with Governors and to ***have an interaction session with the Governors (…), because I suppose they and the Head Teacher obviously and the Deputy Heads, have the most authority****(…)" Oakwood School, Student interview 2, Year 12 boy and girl*

The SMT played a key role in the ego networks of Wellbeing Leads within Woodlands (engagement rank 3, education rank 4, embeddedness rank 2), Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) Schools. However, there was no evidence to say that suggestions were actioned less within Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3), where the SMT did not play a large role in the ego network of the Wellbeing Lead. This demonstrates, in contrast to other areas of health, good collaboration between the Wellbeing Lead and the SMT in relation to student voice in Greenfield School.

Indeed, in all schools it was reported that student voice was not just a tick-box exercise, and that active agency was enacted through taking tangible actions from suggestions put forward by students wherever possible, thus reorienting the school system towards health.

"(…) For example there was a, we had a sort of sore spot, if you like for smokers, which was down, down by the back of our field we had a big forest kind of area. There was about ten trees and ***the suggestion from the Wellbeing Committee was that trees were chopped down, which they have been now****." Greenfield School, Wellbeing Lead*

"Because you know even things like they wanted lockers so you know that was sort of they held meetings and now they've got lockers and healthy vending machines and the fruit tuck shop as well I think was mentioned in the student voice meetings." Highbridge School, Behavioural Support Officer

This may act as a feedback loop to reassure students that they have a voice (Keshavarz et al., 2010) and help them to become more 'committed', whereby they are able to fulfil the capacities for practical reasoning and affiliation, as opposed to 'estranged', 'alienated' or 'detached' (Markham & Aveyard, 2003).

6.4 Conclusion

This chapter aimed to explore variance in the interaction among agents within complex school systems, with regards to health and their implications for engagement with SHRN and the orientation of complex school systems towards health. Ego social network analysis with school staff identified a range of network features, which may offer explanations for the variance between case study schools in responses to feedback on student health. Differences were observed in the seniority of Wellbeing Leads and key brokers, number of dedicated wellbeing roles, and outside agency support.

Highly organised structures with a number of dedicated wellbeing roles, a high level of brokerage and embeddedness of outside agencies within school systems, were characteristics of the more engaged case study schools. Team structure was more developed within the most deprived school, possibly in response to the high level of need of their students. This school was also found to have the highest level of engagement with SHRN in Chapter 5. It was also rated as having the highest embeddedness of health into the school, using measures described in Chapter 4, and performed better than expected academically.

Qualitative insights into structures, which may be required to maximise impacts of health-related feedback on school practice, highlighted a tension between the allocation of the role of Wellbeing Lead to a senior member of staff with the power to make changes within the school, and a more junior member of staff, who was able to dedicate more resources to the role. It was suggested that a distributed leadership approach may be most effective for orienting the complex school system towards health, whereby the main Wellbeing Lead role is allocated to a member of the SMT.

This creates a model of a ‘team structure’ in which there is both a clear overview of health improvement, but where specific roles are delegated among actors within the system, with ties between these various agents and brokerage between groups.

Due to a perception among some, that school councils were unrepresentative, all schools identified the need for multiple mechanisms, including opportunities for confidential input, to be put in place to facilitate student voice, to erode barriers between staff and students (Markham & Aveyard, 2003). The extent to which student voice was perceived to address health issues varied. The role of SMT involvement in change initiation within the school system, and the need for student voice to facilitate meaningful input for students to shape the school environment, was perceived to be important by all stakeholders.

The chapter brought to light the need for a team structure to include non-teaching staff with wellbeing-related roles, in order for wellbeing to become more prominent within the complex school system. This higher level of understanding, of how brokerage and system dynamics within the confines of the school gates may impede or facilitate efforts to bring about change, could be utilised to design complex interventions, which work with the system to achieve change. However, results have not yet addressed the implications for health improvement practice in schools, such as development of a healthy school ethos and integration of health into the curriculum. Moreover, as CASs are open and permeable (Keshavarz et al., 2010), there remains a need to investigate how schools interact with related systems, such as parents and outside agencies. As such, these issues will be addressed within the forthcoming chapter.

7 Results: School system functioning and its relationship with health improvement activity, consistent with the Health Promoting Schools approach

7.1 Introduction

Overall, Results Chapters 5 and 6 have provided insights into variability in school engagement with a health research network in its early stages of implementation, and have also generated candidate explanations for this variance through focusing on the structure of health and wellbeing-related organisational social networks within school systems. Chapter 5 showed wide variation in the interpretation, discussion and perception of school health reports, patterned according to the position of key actors responsible for health and wellbeing within their social networks. Qualitative data elicited positive perceptions of the potential value of SHRN in systematising health improvement. However, it also demonstrated that, at the time of data collection, it had achieved a limited degree of permeation within school systems.

Chapter 6 focused on the social networks of Wellbeing Leads, in terms of perceived importance of interactions, frequency of interactions, centrality, brokerage and cliques. Highly organised structures with a number of dedicated wellbeing roles and a high level of embeddedness of outside agencies within school systems were characteristic of the more engaged case study schools. The least engaged school, by contrast, described more fragile social networks, where information flow was contingent on one or two key individuals with less clear systematisation of health and wellbeing roles. Qualitative insights emphasised the potential value of a distributed leadership approach, whereby the main Wellbeing Lead role is allocated to a member of the SMT, creating a 'team structure' in which there is a clear overview of health improvement, whilst specific roles are delegated among actors within the system, with ties between these various agents and groups. All schools identified the need for multiple mechanisms to facilitate student voice.

This chapter builds upon the previous two. Its overarching aim is to explore how current health and wellbeing-related practice is facilitated or impeded by system functioning. This focuses on perceptions of the extent, nature and quality of activities, processes and structures aligned with the WHO HPS framework (i.e. integration of health into the curriculum, school ethos and engaging with family, community and outside agencies). It also focuses on the extent to which these activities, processes and structures are aligned with school engagement with the SHRN health reports. This chapter will address the following research questions:

f) How does the consistency of health improvement actions with the Health Promoting Schools framework vary between schools with differing network structures and differing levels of engagement with a collaborative research network?

d) To what extent is health and wellbeing embedded into social networks of the school system and how do interactions, internal and external to the school, facilitate the implementation of health improvement activity in schools and the development of schools as healthy systems?

This chapter will firstly provide a discussion of the actions that stakeholders within case study schools describe in line with school engagement with the SHRN health reports and the HPS framework's aim of integrating health into the curriculum. Secondly, the chapter will apply this approach to the creation of a healthy school ethos and thirdly to the engagement with families, the community and outside agencies. The extent to which these actions are facilitated or limited by the structures outlined in Chapters 5 and 6 will be discussed throughout.

7.2 The Health Promoting Schools (HPS) framework

The WHO HPS framework is based on the Ottawa Charter (World Health Organization, 1986). It advocates whole system change, through a settings approach, including curriculum, school environments and engagement with parents and communities. It emphasises both the need for synergistic approaches to health and

education and a need for holistic approaches to health which influence multiple health outcomes simultaneously, rather than multiple single risk-factor interventions. It defines a HPS as 'one that constantly strengthens its capacity as a healthy setting for living, learning and working' (World Health Organization, 1998). As reported in Chapter 4, case study schools varied significantly in terms of scores on a composite measure of consistency with the HPS framework, generated by a School Environment Questionnaire within SHRN. Highbridge School was ranked highest in terms of embeddedness of health (embeddedness rank 1) and had achieved the National Quality Award, whilst Woodlands School was ranked second (embeddedness rank 2) and was at the initial stage of the Healthy Schools Scheme. Meanwhile, Greenfield School was ranked third (embeddedness rank 3) and was working towards the National Quality Award. Finally, Oakwood School was ranked fourth (embeddedness rank 4) and was at stage three of the scheme.

7.2.1 Integration of health into the curriculum

When broken down, scores for embeddedness of physical health in the curriculum for schools in SHRN ranged from 11-75. Within this, Highbridge was ranked highest (70), Woodlands second (43), Oakwood third (29) and Greenfield fourth (25). Meanwhile, for embeddedness of mental health in the curriculum, scores for schools in SHRN ranged from 0-10. Within this, Highbridge School was ranked highest (10), Oakwood and Greenfield Schools were ranked joint second (5) and Woodlands School fourth (4). This section will explore the extent to which, and the ways in which, school stakeholders report embedding health within the curriculum.

In contrast to the variance in these quantitative figures for the embeddedness of physical and mental health in the curriculum, qualitative data showed that health and wellbeing was reported to be used as a tool to weaken the boundaries between subjects in all case study schools. Thus, variance may be masked by interviewer bias in the qualitative interviews (Grimm, 2010). Other members of staff, such as the Food Technology Teachers, had a more subject-specific insight, as well as a limited insight into delivery of health topics within other subjects. Thus, this indicates limited communication and brokerage between teachers in different departments regarding health and wellbeing in some cases (Burt, 2004b).

> *"So in Year 7 they do the Eatwell Plate and the Government Guidelines and that kind of thing and then obviously then it progresses into Year 8 and 9 as well, then in GCSEs you always talk about nutrition and healthy eating and stuff and then at A level, they do a great deal on that at A level." Greenfield School, Food Technology Teacher*

Moreover, there were discrepancies in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) between the Wellbeing Lead, who reported that health and wellbeing was mapped across the curriculum, and a PE Teacher, who discussed this as a potential area for improvement. This may highlight limited communication and brokerage between the sub-systems of the SMT and teaching staff (Burt, 2004b; Keshavarz et al., 2010), which is supported by the Wellbeing Lead's net-map described in Chapter 6. This showed many interactions with different cliques within the school. However, these cliques constituted homogenous groups of agents, such as the SMT or subject teachers, with limited connections between them. Another possible explanation lies in social desirability bias, whereby the Wellbeing Lead, who has primary responsibility for this task, has a vested interest in presenting it in a positive light (Grimm, 2010).

By approaching many topics from different angles within different subject areas, students' capacities for practical reasoning may be improved through a greater ability to view knowledge as multiple, and often conflicting, realities and through an increased understanding that knowledge is socially constructed (Markham & Aveyard, 2003). The mapping of health and wellbeing across subjects may also help to enhance collaboration and communication between subsystems, i.e. between teachers and the SMT. In turn, this may create new informal feedback loops regarding the embedding of health and wellbeing, subsequently leading to the curriculum structure being influenced by the agency of school staff. The Assistant Head for PSE at Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) and the PSE Teacher at Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) described how health and wellbeing was mapped across subjects, whilst the Wellbeing Lead for Woodlands School

(engagement rank 3, education rank 4, embeddedness rank 2) spoke of a well organised monitoring of the mapping of health and wellbeing across subjects to ensure consistent messages across the school.

> *"(…) it's [health and wellbeing] mapped across the whole school in terms of how it's developed in different areas and we feel we offer quite a comprehensive programme really." Greenfield School, Assistant Head for PSE*

> *"Yes, I would question how much depth people go into obviously because it's not always appropriate. But yes I think these are consistent messages across school" Oakwood School, PSE Teacher*

On the other hand, mapping of health and wellbeing may be facilitated by the results reported in Chapter 6, regarding the presence of a team structure and allocation of responsibility for health and wellbeing to a member of the SMT, thus indicating an efficient flow of resources throughout the school (Burt, 2004b). Interaction and collaboration between departments is required for planning to embed health and wellbeing across the curriculum. For example, quantitative data showed the lowest level of embeddedness of physical health and the second lowest for mental health in the curriculum for Greenfield School, where responsibility for health and wellbeing was allocated to a PE Teacher who was not a member of the SMT.

It was also reported that interactions took place between the systems of school and community through ensuring that outside speakers coming in are interacting with a wide range of departments within the school to deliver health-related curriculum (Keshavarz et al., 2010).

> *"We've loads of friends within the community that come in, so that is built in, that's fed in, that's drip-fed into the curriculum (…)" Woodlands School, Wellbeing Lead*

Ego networks reported in Chapter 6 showed that Highbridge School reported more frequent interactions with outside agencies. Therefore, a possible link between embedding health across the curriculum and brokerage and collaboration with outside agencies (Burt, 2004b) is supported by the quantitative data showing Highbridge School to have the highest level of embeddedness for physical and mental health in the curriculum. However, despite Woodlands School reporting that outside agencies contribute to curriculum delivery, which is supported by their score of second for embeddedness of physical health in the curriculum, they showed the lowest score for embeddedness of mental health.

7.2.2 Structure and delivery of Personal and Social Education

All schools had PSE programmes as this is a requirement stipulated by the Welsh schools inspectorate (ESTYN). The importance of PSE curriculum was emphasised within all case studies.

> *"But also you know there is a load of children there who are accessing the curriculum through the PSE days who* ***you'd be surprised at how much it changed their perspective*** *(…)" Greenfield School, Assistant Head for PSE*

> *"so yeah it's [PSE] massive. I mean there's lots we could be and should be doing more, it's huge. But yeah, quite rightly, it's very important." Woodlands School, Wellbeing Lead*

The structures surrounding the implementation of the PSE curriculum varied by case study, with Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) implementing 'PSE days' every month, as opposed to weekly timetabled classes, which were standard practice within the other case studies. Both strategies may have implications in terms of embedding PSE into the school system.

Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) was the only school to have employed a dedicated PSE teacher. In Chapter 6, the PSE Teacher was reported to play a key role in a small organised wellbeing structure within the school. The other case study schools relied on a combination of class

teachers and outside speakers to deliver PSE curriculum. The PSE teacher reported that they had time to dedicate to planning according to the needs of each class and to engaging with outside speakers, thus improving interactions between systems (Keshavarz et al., 2010). This was perceived to have implications in terms of ownership of the subject, which has the potential to impact the extent to which students benefit from this curriculum. For example, the Wellbeing Lead and PSE Teacher from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) suggested that teaching staff may view PSE as a burden and feel embarrassed teaching sensitive topics. This may, in turn, affect the quality of delivery through undermining the key messages delivered to students.

> *"I keep saying this, but every time that PSE is taught, it's being taught by a specialist and that's made a huge, huge difference because* ***if everybody teaches PSE, as it used to be in this school, then there is no ownership and people don't really want to teach it*** *(…)" Oakwood School, Wellbeing Lead*

> *"the overwhelming message came out that* ***students wanted to be taught by one specialist****, and that when it was taught by a non-specialist sometimes there were topics that staff didn't want to cover (…). But some of the more perceptive Key Stage 4 students noticed that* ***in staff not feeling comfortable talking about a subject they inadvertently undermined it****." Oakwood School, PSE Teacher*

The value of having a specialised PSE Teacher to deliver PSE classes was supported by a student from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4).

> *"I think we need more skilled PSE Teachers though, one's that are actually set just for PSE because then we obviously learn better things and it's more useful" Oakwood School, Student interview 4, Year 7 and Year 11 boys*

All other case study schools, who did not report having dedicated PSE teachers, also expressed concern that key messages may be undermined if teachers felt uncomfortable teaching certain topics, such as sexual health.

Case study schools reported using strategies, such as bringing in outside speakers, to overcome this. They cited that students were more likely to relate to concrete examples from the real world. This relates back to the need for complex systems to be open and to involve multiple stakeholders, such as outside agencies, through the weakening of boundaries (Keshavarz et al., 2010).

> *"**because there's some areas I wouldn't feel completely comfortable in teaching actually correctly**, especially when it comes to the law it's nice to have him there to speak to the pupils and actually he's got actual real life studies and case studies that he's been on [Police Officer] so I think it makes the stories more real for the pupils." Woodlands School, Food Technology Teacher*

> *"**If I'd been telling them all that stuff [drug education], I don't think they'd have taken it on board at all**. But he [outside speaker and former drug addict] was showing them his actual leg and it was totally, well it was like a piece of corned beef, you know, **it was awful where he had injected heroin and then it really brought the message home to them**." Oakwood School, Wellbeing Lead*

This could also represent a gap in teacher training that needs to be identified. One parent from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) explained that she would not feel comfortable or knowledgeable enough to discuss some subjects, such as substance misuse, with their children. In light of this, they perceived it to be important for the school to utilise outside speakers.

> *"(…) well I don't mind having the conversation with her but I don't know they seem to know more than me, especially things like drugs (…)" Highbridge School, Parent interview 1, Female, Member of staff, Teaching Assistant*

Delivery by outside speakers was also valued by students due to their interest in listening to a novel expert voice. They also stated that they would feel more comfortable disclosing to or discussing issues with outside speakers.

> *"Because I think they're more knowledge-based it's their job. With the teacher they are, their strong subject is Maths* ***whereas if you have a speaker in that's like it's their job to know to come in and speak about what smoking is and what it does to you, then it's more, they are more knowledgeable about the topic*** *rather than a teacher looking it up and just saying oh I've found this and blah-blah-blah. They know." Highbridge School, Student interview 2, Year 9 girls*

This was supported by parents from Highbridge (engagement rank 1, education rank 1, embeddedness rank 1), Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) and Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) Schools who perceived that children would listen to outside speakers more than their teachers.

> *"****Yeah would take it on board more, well not take it on board but they could see the story behind it****. Where I can say don't do drugs it's bad, well the person can say well this is what happened to me, I lost my house, I lost my family through drinking, drugs whatever and I hit rock bottom (…)" Highbridge School, Parent interview 3, Member of staff, Lead Learning Coach*

7.2.3 Creating a healthy school ethos

Scores for the number of health topics covered within written policies for schools in SHRN, used as an indication of the embeddedness of health within schools "rules" or ethos, ranged from 0-7. Within this, Highbridge, Woodlands and Greenfield were ranked joint highest (5), and Oakwood fourth (2). Culture can be defined as the more formalised rules, policies and core values of the school, as well as the physical properties, organisation, characteristics of staff members and how they interact

(Nias, Southworth & Yeomans, 1989). Ethos can alternatively or additionally be described as the feel of the school which is experienced as a result of behaviour within the system, rather than comprehended (Solvason, 2005). Efforts to establish a school ethos can be seen as a way of promoting the values that the school wants all staff and students to internalise and use as a guide for their actions (John & Osborn, 1992). This may include the establishment of written policies aiming to communicate acceptable and unacceptable codes of behaviour. The terms culture and ethos are often used interchangeably in the literature, but here the term 'ethos' will be used to refer to all of the above factors. These factors interact to influence the emergent behaviour of the system and can help to orient the system towards health and wellbeing (Keshavarz et al., 2010), as well as affecting both intrinsic factors (general dispositions and knowledge of how they should act) and internal and external structures (the structural context of action within and outside of the school gates) to support the ethos.

The SHRN Manager felt that there was 'a sort of general understanding that health is important' among schools. She also emphasised that in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) in particular, which was the school with the highest level of engagement with SHRN, 'wellbeing is really core to their, to the way they think'., The Healthy Schools Coordinator for Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) described how creating social norms through the school ethos is more likely to reorient the school system towards wellbeing.

> *"if you're creating a social norm where people are healthy they do make the right food choices, they are active,* ***it's more likely to influence the school as an institution I suppose, to have that ethos*** *rather than just a few people doing the one thing." Greenfield School, Healthy Schools Coordinator*

However, while this quote goes beyond education to consider social influence, it is consistent with liberal paternalist approaches which attempt to change the 'choice architecture' around individuals (Johnson et al., 2012).

There was a consensus between and within all case study schools that they prioritised pastoral care and the creation of responsible citizens, together with educational issues. For example, Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) described how they adapt the daily running of the school to accommodate wellbeing-related needs. This is consistent with Highbridge scoring joint highest for the number of health topics covered in school policies. It may also link to the results reported in Chapters 5 and 6, which showed Highbridge School to have the highest level of engagement with SHRN and the most developed team structure. This could perhaps reflect a prioritisation of health and wellbeing in this school, which may suggest a school ethos oriented towards health and wellbeing.

> *"(…) So yeah, those are the core values, so basically being listened to, having a good rapport with the teachers, but also sort of knowing where you are in terms of behaviour and that kind of thing, and yeah sort of being listened to. I think they do quite a lot here to do with listening to learners, I think it's quite good with that. Just* ***like school should be a safe, healthy place really, where their wellbeing's promoted,*** *I'd say yeah." Greenfield School, Food Technology Teacher*

> *"(…)* ***I think it's a very caring school****, I think it's not just about, obviously providing and education and learning - that's one of the main things - but I think, I think the child's wellbeing, emotional and psychological wellbeing is also very important to staff here" Oakwood School, Learning Support Assistant*

In support of this, most parents described their schools' ethos as caring and inclusive. This was even apparent in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) where their wellbeing team was far less developed compared to the other three case study schools. Thus, this demonstrates little variance between schools in terms of ethos, which is supported by the minimal variance shown within the quantitative data on the number of health topics covered by school policies.

*"(…) to be honest **it just felt that it was just a very caring environment** [when they first visited the school] and that's what we picked up." Greenfield School, Parent interview 1, Female, Member of staff, Learning Support assistant*

*"(…) **it's not all about the academic side of things, it is about individual pupils and promoting their needs** and what's best for them rather than as a mass if you know what I mean. I actually came to this school as well. I wouldn't have wanted my son to go anywhere else." Woodlands School, Parent interview 4, Female, Special Educational Needs Support*

*"**It's a very caring school I think. You know because I work here as well and I came here myself** (…). It's like they are all sort of like extended family and you know I know any problem and I can just go to them and it gets sorted." Highbridge School, Parent interview 1, Female, Teaching Assistant*

This also supports the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003), which argues for a focus upon breaking down barriers in terms of interpersonal interactions over and above direct efforts to improve wellbeing. However, the parents interviewed for Greenfield (engagement rank 4, education rank 2, embeddedness rank 3), Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) Schools were all members of staff at the schools. This may have provided them with a better insight into the school ethos. In contrast, none of the three parents interviewed for Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) were members of staff. Within the parent interviews in Oakwood School, only one parent was able to articulate their perception of the school ethos.

"I 'spose putting the children first, at least if they're there for them, they're able to be you know there for them you know, helping them out really." Oakwood School, Parent interview 2, Female, Not a member of staff

Many students from three case study schools (Greenwood, Woodlands and Highbridge) perceived the rules and core values of the school to increase their feelings of safety. Interestingly, almost all of these quotes came from lower school students; two from Year 7 and 8 girls and one from Year 9 boys.

> *"S1: Safe I guess, so there is always someone to go to if we need any help. R: Yeah. S2: And it's like someone who has always got our back." Greenfield School, Student interview 3, Year 8 girls*

Markham & Aveyard (2003) propose that such feelings of safety and school connectedness could lead to improved capacities for practical reasoning and affiliation and, subsequently, health behaviours and outcomes. Further to this, a Year 10 boy and Year 11 girl from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) stated that they felt safer in the school environment due to teachers showing that they care. This may represent how internal structures (the structural context of action within the school gates), such as the presence of caring teachers and health and wellbeing-oriented core values may affect students' intrinsic factors (general dispositions and knowledge of how they should act). This relates to their perceptions of power, norms and meaning within their environment (Stones, 2005).

> *"S1: 100% yeah because if we were in a school where we couldn't speak to the teachers I don't think it would be a nice environment. S2: No, you feel…. S1: Safer. S2: Yeah* ***you feel safer and as if there is a problem it will be sorted out*** *and it's not going to drag on so yeah." Woodlands School, Student interview 4, Year 10 boy and Year 11 girl*

One Year 8 boy from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) directly attributed the support he had received from the school to have helped him begin to overcome mental health issues. Other students reported that the presence of caring teachers increased student connectedness. This links back

to the Theory of Health Promoting Schools (Markham & Aveyard, 2003), which states that eroding barriers between students and teachers can help students to fulfil the essential capacities of affiliation and practical reasoning.

> *"S1: **they actually do honestly care** about how we are feeling and it's not just about oh we're the teachers and we decide, they actually do take on our opinions and listen, which is really nice. S2: It is nice. **It makes you feel as if you are part of the school**" Woodlands School, Student interview 4, Year 10 boy and Year 11 girl*

Despite this, two Year 9 girls from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2), who were described by the Wellbeing Lead as high achievers, who were alienated from the school, reported that they did not perceive teachers to care about students.

> *"S1: (…) Because **if you've got a teacher who dislikes you or acts like they dislike you, you're not going to want to be friends with them or do what they say**. S2: Yeah I have on, we have only two teachers that I actually like." Woodlands School, Student interview 3, Year 9 girls*

They reported that this resulted in students' alienation from the school and decreased respect for teachers. In contrast to other students from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2), they also reported a lack of rule enforcement by teachers. In contrast, a Year 7 and Year 11 boy from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) reported that staff are supportive and enforce health-related rules, which they perceived to lead to higher levels of attendance. This suggests that enactment of agency may be influenced by the effect of internal structures (the structural context of action within the school gates), such as the provision of supportive non-teaching staff, on students' intrinsic factors (general dispositions and knowledge of how they should act) (Stones, 2005).

> *"A lot of people, well most people like school, some don't, but **some people still come because the school is quite supportive as well**. So if they have any problems we have the school counsellor, we have [PSE Teacher], [Wellbeing Lead/Deputy Head], we have quite a lot of teachers that are supportive about things." Oakwood School, Student interview 4, Year 7 and Year 11 boy*

Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) reported having overt mechanisms in place to encourage staff to value wellbeing. The Wellbeing Lead stated that this changed the attitudes of many teachers who were reluctant to let their students out of classes to access services from outside agencies, such as the Youth Offending Team. This stands as an example of how the internal structure (the structural context of action within the school gates) of the school, such as the staffing structure, can be manipulated to increase the likelihood of staff having views on health and wellbeing which are positive, internalised and aligned. The internalisation of wellbeing and overt support from the SMT could be viewed as an attempt to shift norms within the school so that attention to health becomes an internalised norm, or part of the ethos or informal 'rules' of the school. This could, in turn, improve staff and student relationships and facilitate the enactment of wellbeing-related agency (Feldman, 2000; Greenhalgh & Stones, 2010).

> *"(…) we had this big talk and obviously training where staff went into and accessed things like Women's Aid and saw what it was like and Young Carers, and it wasn't long, it was very snappy, only about 10 minutes, but **they had about 8 experiences of these external agencies and they felt then much, much, well they changed their attitudes**" Oakwood School, Wellbeing Lead*

However, this represents a simplistic view of how whole school system change can be achieved. Instead, school functioning is altered as a result of an interplay of the characteristics of complex systems which lead to emergent outcomes (Keshavarz et al., 2010). This was also demonstrated by the Wellbeing Lead from Greenfield

School (engagement rank 4, education rank 2, embeddedness rank 3), who claimed that she had been instrumental in changing the school culture in order to reduce the focus from achieving five A*-Cs to believing that every child can achieve something.

> *"I think we've seen a massive shift in our school in terms of ethos of the school and in the fact that well, I've been in role now for around about two years and,* ***I mean it's not just me, it's the whole, I guess I started the ball rolling with changing ethos with the staff and the pupils in that every pupil can achieve*** *(…)" Greenfield School, Wellbeing Lead*

A positive ethos was also reported to be generated through student awareness of staffing structures to facilitate a quick response to issues, as addressed in Chapter 6. Schools reported mechanisms to facilitate this through the provision of wellbeing desks, student support centres, pastoral teams and a full time School Nurse. This may help to ensure that students had non-teaching staff available to approach at all times, thus contributing to the development of a school ethos which prioritises health and wellbeing. This may also help to increase communication between sub-systems, i.e. staff, students and parents (Keshavarz et al., 2010), thus supporting the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003).

> *"The Head [Teacher] has invested substantially in what we call Student Support Services. There's five, six, seven members of staff here who are literally for the pastoral, emotional and wellbeing support of the pupils (…)" Woodlands School, Wellbeing Lead*

This may contribute to breaking down the boundary between students and teachers and, subsequently, to improving their competencies (Markham & Aveyard, 2003). Furthermore, the provision of these structural resources may improve students' normative expectations around how the school deals with wellbeing issues.

Student voice and school ethos

Within each of the four student interviews for Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), a positive effect of student voice where students felt that the school genuinely listened to and implemented suggested changes, as reported in Chapter 6, was discussed. Students reported that this contributed to them feeling more valued, happy and connected to the school and made the school a nicer environment to be in.

> *"Yeah we are very lucky with our school. I think and they kind of, they all the money that comes to our school they always do it, they always spend it on us as well and I think* ***a lot of us respect the school as well because we know that the school will always kind of pay for things for us to make us happy*** *and I think we are fortunate as well in school." Highbridge School, Student interview 3, Year 8 girls*

Year 9 girls spoke of a collective effort to improve the school, which contributes to a sense of belonging. This may improve school connectedness (Markham & Aveyard, 2003). In contrast to other discussions, the following quote focuses on a collective effort to improve the school and improve school ethos as a whole.

> *"It makes you like it makes you feel like you're a part of something because like if you've got something to say and you, like you've got like an idea and it would benefit the whole school and you keep it to yourself then it's not benefitting others. But then* ***if you share it makes you feel like that you've had a part to play in the involvement of something new within the school****." Highbridge School, Student interview 2, Year 9 girls*

Furthermore a Year 11 boy from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) and Year 8 boys from Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) reported that having suggested changes implemented in the school improves happiness among students.

"S1: Well if they put their ideas forward and they are good ideas and they are put forward then that will make them happier and that will make them concentrate more because they are in a more comfortable environment. S2: And ***if you feel that you're listened to and you're not being ignored then you're going to feel better about yourself****." Greenfield School, Student interview 1, Year 8 boys*

Conversely a Year 11 student from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) suggested that if ideas are not listened to, then students feel disengaged from the school and may be less likely to engage with student voice. This relates to the Theory of Health Promoting Schools (Markham & Aveyard, 2003) where, by creating more 'committed' students, schools are more likely to develop the capacities to lead to enactment of healthy behaviours in adulthood among their students. This also supports the results reported in Chapter 6, which concluded with the need to manage students' expectations in terms of their potential to affect changes in the school. This, therefore, may contribute to an improved school ethos.

Ethos and perceptions of the link between health and educational outcomes

One issue that was perceived to contribute greatly to staff placing a greater value on health and wellbeing is their perception of its link with educational outcomes. Indeed, many of the staff within each of the case study schools expressed a belief that these factors were linked, both when prompted and when approaching the subject themselves.

"(…) ***I think that definitely helps, showing schools that health, positive health behaviours can impact on attainment in school****, on concentration levels, that sort of thing, that really, that does help, but also it's showing them that it does create a better environment and atmosphere for their school as well (…)" Greenfield School, Healthy Schools Coordinator*

The link between pastoral care and wellbeing was particularly emphasised by the Wellbeing Manager in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1). This was the case study school with the highest level of deprivation (>40% FSM) and a strong pastoral team in place. The fact that Highbridge School showed educational attainment more than 19% higher than expected for their level of deprivation, as reported in Chapter 4, suggests that the assumption of this link and subsequent focus on wellbeing can indeed be advantageous.

> *"It's really helped the school I mean* ***you know overall with the results of the school has just, you know it's just gone up every year*** *throughout and the Head Teacher has always sort of* ***stemmed that from having such a really strong pastoral team*** *(…)" Highbridge School, Wellbeing Manager*

The level of need perceived within the school in response to factors such as the socioeconomic status of the students may drive the creation of a wellbeing-focused ethos with a higher number of resources dedicated to pastoral care, as discussed in the previous chapter. This facilitates further weakening of the barrier between students and staff by creating opportunities for discussion and dealing with pastoral care issues (Markham & Aveyard, 2003). This links back to Chapter 6, whereby the importance of providing resources, such as non-teaching staff who have wellbeing written into their role, was evident.

Many students also perceived a link between health and educational outcomes. In particular, students from Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) and Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) Schools stressed that having a health or emotional issue may affect concentration.

> *"(…) if you were sad you have obviously got things to worry about but if you're happy then* ***you haven't got anything to worry about so you can just concentrate***

on what you're supposed to be doing." Woodlands School, Student interview 1, Year 7 boys

"It would like all bottle up inside and they won't really want to take part in anything, they could like stop all their outside activities because of what's happened in school and ***they could just like completely zone out and focus on the problem.****" Greenfield School, Student interview 3, Year 7 girls*

This reiterates the need to have staffing structures and systems in place to deal with any issues quickly, as discussed in Chapter 6. This was supported by parents who worked in both Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) and Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) Schools.

*"****You can't have a child who is stressed and then getting good, the grades they could get****, if they really or if they've got personal problems something has happened to the family you know the school is really good at dealing with that." Highbridge School, Parent interview 1, Female, Member of staff, Teaching Assistant*

"And also with regard to their emotional wellbeing you know they come in sometimes and ***they just can't concentrate on what they should be learning because there is so many other things going on in their lives****." Woodlands School, Parent interview 3, Female, Member of staff, Teacher*

In addition, both students and parents explicitly associated health behaviours with concentration in class, leading to a subsequent improvement in educational outcomes. This included perceiving a link between the following factors and a higher level of concentration in class and better exam results; breakfast consumption, having sufficient sleep, not smoking or drinking, not being hungry, not consuming energy drink and other dietary factors.

"Because if you have something healthy for breakfast before you go into an exam you're, you can go in and you're like ok I'm ready for this (…)" Highbridge School, Student interview 2, Year 9 girls

*"**It's got to affect concentration hasn't it**, because if you're hungry in the morning, you're not going to function properly." Oakwood School, Parent interview 1, Female, not a member of staff*

*"Yeah if they don't have enough sleep it means **they're tired which means they don't do work as well** as they should and you know they've got more energy to do things, in my opinion (…)" Oakwood School, Parent interview 3, Female, Not a member of staff*

Common approaches to addressing these issues simultaneously included providing subsidised breakfast clubs, pre-exam revision and breakfast sessions and reaching out to more socioeconomically deprived parents. However, the pre-exam breakfast seems to represent an initiative aiming to provide a temporary cognitive boost to facilitate students through their exams and to achieve the core educational aims of the school, rather than one designed to promote health. This sits contrary to longer term initiatives, which encapsulate the synergy between health and education (Bonell et al., 2014).

*"We've applied to the Children and Young People's Grant for funding for pre-school breakfast before every exam. So this morning, the 75 children have been in school since half past 7 and they've had breakfast with us, we've given them hot drinks, fruit, toast, some of them have had extra food as well. **They then go on to a revision session from breakfast, this was before their exam.**" Highbridge School, Wellbeing Lead*

These approaches alter internal structures (the structural context of action within the school gates) and intrinsic factors (general dispositions and knowledge of how they should act) which may facilitate the agentic expression of more deprived students

(Stones, 2005). Subsequently, deprived students' engagement with these structures and any measured or perceived improvement in health and wellbeing or educational outcomes in this group may act as positive feedback loops to promote positive changes and the orientation of schools towards health improvement (Keshavarz et al., 2010).

7.2.4 Engaging with families, community and outside agencies

When broken down, scores for embeddedness of parental involvement for schools in SHRN ranged from 0-12. Within this, Highbridge was ranked highest (9), Woodlands and Oakwood were joint second (8), and Greenfield School fourth (7). When prompted, students, staff and parents emphasised the importance of health being promoted at school, for reasons such as the high proportion of waking hours spent in school and the need to prepare students for later life. For example, as addressed in Chapter 6, this may be facilitated by having the support and involvement of senior management alongside the distribution of responsibility for health and wellbeing among other staff with more time to dedicate to health and wellbeing. According to Strong Structuration Theory (Stones, 2005), this may lead to a positive impact on students' perceptions of legitimation, domination and signification and their attitude in relation to wellbeing. This, in turn, may elicit positive behavioural changes. Moreover, all stakeholders reported the high level of influence of parents on students' health and wellbeing and, thus, the need to align health and wellbeing messages and approaches between schools and families.

> *"(…) you know she is in school what is it, 6, 7 hours a day. By the time she comes home and goes out with her friends you know I don't see her that much probably only on the Saturday and Sunday.* ***So it is good that what I am saying [in] the house they are reinforcing in school****." Highbridge School, Parent interview 1, Member of staff, Teaching Assistant*

> *"yeah a lot of people just follow their parents' example as well, yeah so* ***if they communicate and tell you, like make compromise the school and the parents, and they'll make up a rule between them and yeah****." Oakwood School, Student interview 3, Year 7 boys*

This weakens boundaries between the school and parents and may also promote school connectedness and a higher proportion of 'committed' students. This is due to the core values being influenced by parents and, therefore, being more varied and reflective of the community (Markham & Aveyard, 2003).

It was reported by students in each case study school that mechanisms to engage parents were currently in place. These included open evenings, telephone calls, emails, school website, letters and newsletters. It was reported that teachers call parents to discuss positive or negative issues in Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) and Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) Schools. However, some of the mechanisms outlined above did receive criticism; for example, a Year 12 boy from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) believed that newsletters often do not reach parents.

> *"Maybe there is a more efficient way of doing it than a newsletter because, as you say,* ***newsletters, if you're giving them out to us at 9 o'clock in form, then most of them are in the bin by ten past nine****. But if that information could get to every parent, then issues, such as health could be dealt with more efficiently maybe?"*
> *Oakwood School, Student interview 2, Year 12 boy & girl*

In particular Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) and Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) Schools emphasised the ease of parents making face to face appointments. Within Highbridge School, the health of the family was also viewed as a priority, which was conducive to their system adaptation to the needs of their students and families due to a high level of deprivation (Keshavarz et al., 2010). This may also help to ensure positive health messages are aligned between home and school.

*"So that means **the wellbeing of not just only the child, but the family as well** and comes under that umbrella is their general health and wellbeing, their social health and wellbeing, their mental and physical wellbeing and certainly their academic progress as a result of those things being put into place." Highbridge School, Wellbeing Lead*

*"And once again feed that back to their families as well **because I think that's important that we do try and educate the whole family rather than just the child**, you know?" Highbridge School, Wellbeing Manager*

Some staff , students and parents even noted that in these cases, role reversal was prevalent whereby children would educate parents about what they had learnt in school regarding health, an example of interactions between systems (Keshavarz et al., 2010). This is also consistent with Structural Hole Theory, whereby students acted as brokers to facilitate the flow of information regarding health and wellbeing between the school and families (Burt, 2004b).

"(…)a lot of pupils will turn around and say to their parents well actually I don't think we should do this because its, I've learnt about this in school today and you know. (…)" Woodlands School, Head of Student Voice/Science

*"Like after like if we have a lesson on like healthy eating and you'd go and like tell them like in cooking we'd like you do the eat well plate and then like you say oh mum this is like part of this and you should have it but not like so much of that. **So you're informing them about what you've learnt**." Highbridge School, Student interview 3, Year 9 girls*

*"(…) **it's great because he lectures his aunty who smokes**, my son does and my partner, my husband smokes and [name of son] will give him chapter and verse of why he shouldn't smoke. (…)" Woodlands School, Parent interview 4, Female, Member of Staff, Special Educational Needs Support*

This is aligned with previous research which has found children to be capable of engaging as agents of change in the community (Onyango-Ouma, Aagaard-Hansen & Jensen, 2005).

Role reversal was harnessed and actively encouraged by some schools. For example, the dedicated PSE Teacher in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) set homework which instructed students to discuss the issues raised in class, with their parents, thus emphasising the two way interactions between systems (Keshavarz et al., 2010).

> *"So, for example, when we looked at breastfeeding, they weren't to go home and ask mum or aunty or whoever whether they breastfed but they were to go and ask what's your opinion. And it was very funny I was in a café recently with, with a former student having lunch, and a woman that I didn't know came over and said she must have heard me say the word [school name] so and came over and asked did I work in [school name] asked who I was and then* ***thanked me because she said that her daughter had come home and was asking about breastfeeding at the dinner table.****" Oakwood School, PSE Teacher*

The actions of the PSE Teacher suggest a pivotal role for non-teaching staff in engaging parents and families. Thus, the fact that many staff reported that children were taking healthy messages home to parents could demonstrate that these children are developing a view that there are multiple realities. In turn, they are, therefore, able to question their parents' actions and views on health (Markham & Aveyard, 2003). This may occur through increasing student connectedness and improving their general competencies, so that they have more resources to counter negative health messages and barriers in the home (Markham & Aveyard, 2003).

School open to communication from parents

Staff highlighted the importance of information transfer whereby parents are informed of health messages and wellbeing and schoolwork issues through notes in homework diaries and text messages regarding absenteeism. This helps to keep

parents informed and may be more realistic in terms of the time and space available to school staff to dedicate to this issue. However, reciprocal communication is also required.

Alongside the importance of the school contacting parents, the need for parents to perceive that the school is available for efficient, rapid and open communication was discussed as a strategy for enhancing reciprocal communication with parents. Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) reported employing strategies to ensure this, such as not having a switchboard system, ensuring that parents are able to set up meetings with staff quickly and employing a full-time nurse to engage with parents. The Wellbeing Lead referred to these strategies as 'old fashioned values' and perceived them to enhance information flow between systems and to help to build a cohesive working relationship (Keshavarz et al., 2010). This is also essential to allow parents to provide feedback loops to alter system functioning (Keshavarz et al., 2010). SMT commitment to health and wellbeing, as discussed in Chapter 6, may also play an important role as senior staff members have the power to enact agency to make changes to the school.

> *"(…)* ***We don't have a switchboard system where we have to press 1, 2, 3 and so forth, we actually you speak to one of our secretaries who passes on any concerns and concerns are dealt with immediately*** *so that they don't really get into, children don't get into a state about worrying about coming into school the following day. So there's somebody here to take the call at all times, so I just feel that it's the intimacy of us with the parents that is very important." Oakwood School, Wellbeing Lead*

This suggests that the school can be seen as an extension of the family and represents structures and organised mechanisms for information flow, which have been established to facilitate communication between parents and schools (Keshavarz et al., 2010).

Highbridge School staff cited physical and frequent parental meetings to ensure that parents feel supported, rather than intimidated, as a method to foster an effective relationship and communication line with parents. This suggests that there is an informal ethos around how to communicate with parents and promote interaction between systems, which is driven by the Wellbeing Leads, who are often members of the SMT (Keshavarz et al., 2010).

> *"(…)* ***the link we have with parents here in the school is excellent you know, that we hold many obviously parental meetings****. If we've got any concerns which are more than happy to come in and then know why they're coming in, not sometimes some parents feel intimidated going into schools. I mean maybe, and I can't speak for all parents, sometimes they may still feel a little intimidated but the majority feel happy for that they know they're coming in for that support, for support with their child and we can speak openly you know obviously within what's going on with individual pupils to the parents and they're happy for that support (…)."*
> *Highbridge School, Wellbeing Manager*

Many parents reported feeling comfortable approaching the school with teaching staff being a more prominent point of contact in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2). This school did not have as many non-teaching staff with wellbeing roles in place and had the least developed wellbeing team structure of all four case study schools. Parents from Woodlands School focused on knowing who the relevant Heads of Year were and felt happy to contact them. Whilst a parent from Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) reported that the Head Teacher responds quickly to parents who contact her. Moreover, parents from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4), who did not work in the school perceived school staff to be open to contact and reported feeling comfortable contacting the school.

"(…) I mean I've spoken to the Head of Year, I've spoken to the Deputy Head I think at one point, you know they're all friendly and wanting to help." Oakwood School, Parent interview 1, Female, not a member of staff

This was supported by several parents and students who reported that staff are quick to respond.

"(…) if it's not something that can be resolved quickly then they are sort of monitoring things or some things might take a little longer to sort out, yeah ***I'm happy and the Nurse especially. I think she's brilliant.****" Oakwood School, Parent interview 1, Female, not a member of staff*

"if there is a problem and a teacher isn't available because they've got lessons when they have free lessons they will call you back straight away, as soon as they can to sort out the issue." Woodlands School, Student interview 4, Year 10 boy & Year 11 girl

Furthermore, students from Woodlands (engagement rank 3, education rank 4, embeddedness rank 2), Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Greenfield (engagement rank 4, education rank 2, embeddedness rank 3) Schools reported that their schools were open to parents initiating contact.

"(…) there is a load of teachers round so they can just speak to one and the teacher they spoke to can pass a message on to the person they want to speak to." Woodlands School, Student interview 1, Year 7 boys

"Whenever they [parents] want to call or whenever they want to come up it's free like they have the office, they have [Head of Year]." Highbridge School, Student interview 3, Year 8 girls

"(…) they have a number that directs you to the wellbeing Office I think. The Wellbeing Office can talk to parents at home and discuss matters." Greenfield School, Student interview 2, Year 9 girls

It is particularly important for parents to feel comfortable approaching the school so that they promote system self-organisation and adaptation through providing information to the school about specific health issues affecting their child, such as an ongoing health condition, or health issues emerging in the community, such as drug use. This may help the school to respond and adapt according to need, thus creating feedback loops (Keshavarz et al., 2010).

"(…) cannabis is rearing its head again as a gateway drug in Year 10 so we've got a drug aid involved with pupils again who we know, and ***parents have informed us of using.****" Woodlands School, Wellbeing Lead*

*"****The parents of Year 8 students would inform me of any health problems****, like any operations or like if they are hard of hearing, migraines." Woodlands School, PE Teacher*

Moreover, parents reported perceiving themselves to have a voice in the school. In particular, parents from the most deprived school described working with the local councillor to arrange petitions, thus demonstrating a community-based approach within the school.

"(…) If there was something they really didn't like there would be a certain amount of those people would get together and they would do a petition (…)" Highbridge School, Parent interview 2, Female, Member of Staff, Cover Supervisor

These mechanisms are examples of structures which may help to increase parents' actual and perceived power (intrinsic factors or general dispositions and knowledge

of how they should act) to exert their agency and affect change within the school (Stones, 2005). However, in reality, many parents reported that there would need to be several parents with the same view and it would need to be a sensible and feasible suggestion to affect change in the school.

> *"It depends whether they thought it was worth changing or not really. I suppose the end of the day they would listen to what you think and then obviously they decide as a school then what to do." Oakwood School, Parent interview 3, Female, Not a member of staff*

This may affect the knowledge of parents with minority views' of the strategic terrain. For example, they may perceive that parents are powerless to affect change within the school (Stones, 2005).

Moreover, some parents found it more intimidating to contact secondary, compared to primary schools. They reported that this was due to their larger size, in addition to the fact that they are not in daily contact with teachers in the playground. This is the case in primary schools where children are usually collected by their parents. However, a parent from Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) reported that although communication is slower in secondary compared to primary schools, problems are still resolved.

> *"there is a difference [between primary and secondary], but not to the outcome" Woodlands School, Parent interview 1, Female, Member of Staff, Special Needs Assistant.*

> *"(…) in primary school they come out don't they with the teacher at the end of the day so if you've got any problem then you can sort of see the teacher there and then (…)" Highbridge School, Parent interview 1, Female, Member of staff, Teaching Assistant*

This was supported by the SHRN Manager who emphasised the importance of aligning messages between these school and parent systems, whilst acknowledging that this is more difficult to achieve in a secondary school where parents are generally not physically present on the school site.

> *"(…) I think it's probably easier with younger children because I think parents have a much more, they're there, they take the kids to school, they're there on site." SHRN Manager*

Staff also perceived there to be insufficient time to engage with parents due to school size and pressures on academic attainment. Staff made comparisons between secondary and primary schools in terms of size, parental involvement and ownership of a specific class.

> *"**In a primary school you can meet a parent at the gate or you can invite them in for coffee morning** and parents come in and you have more of an active role with the parent. In secondary school it's quite hard to do that, we kind of lose them a bit. So we want to try and keep hold of the links with the parents" Greenfield School, Wellbeing Lead*

This represents the internal structures (the structural context of action within the school gates) which may hinder the enactment of agency to facilitate parental engagement (Stones, 2005). Thus, despite parental involvement being wider-reaching than health and wellbeing, the health and wellbeing-related structural findings from Chapter 6 may be of importance here. For example, Chapter 6 reported the allocation of responsibility for wellbeing to a PE Teacher within Greenfield School, with SMT involvement in their ego network limited to two Assistant Heads. This may limit the Wellbeing Lead's influence on health-related parental involvement. Moreover, this supports the findings reported in Chapter 6, whereby it was perceived to be more difficult to create a team structure due to the larger size of secondary schools.

Relationship building was perceived by staff to be made easier due to each school's pivotal role in their communities. In particular, Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) suggested the fact that their Wellbeing Lead was embedded in the community facilitated communication with parents and helped to align health messages between systems (Keshavarz et al., 2010).

> *"(…) I think who you are in the community means a lot and the fact that [Wellbeing Lead] is,* ***she is part of the furniture here means that parents will endorse her messages to their children****, rather than being a newcomer to the community (…)" Oakwood School, PSE Teacher*

The perception of the school being at the centre of the community was particularly endorsed by parents in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), who described a family community centre and events, such as a Christmas fair to involve parents in the school community. In contrast, this was not mentioned by parents interviewed from the other case study schools.

> *"Like I was a pupil here myself so a lot of the children coming through I already know their parents and that so, and that's* ***a lot of our staff were ex-pupils from here so the rapport and that with the community*** *and that because they have community functions going on and school fetes and that and the whole community come out you know (…)" Highbridge School, Parent interview 3, Female, Member of staff, Lead Learning Coach*

The fact that many generations of the same families attended Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) was also perceived to contribute to the community feel of the school.

This section highlights that internal structures (the structural context of action within the school gates) are in place to respond to parental requests and queries in a timely manner to varying degrees within all case study schools. However, most strategies remain somewhat passive, with a reliance on parents being willing to contact the school. Therefore, the importance of parental awareness of who to contact was evident.

Targeting disengaged parents

Many staff and parents acknowledged that, due to the multitude of barriers that families may face and enduring family culture, positive health messages delivered by the school may be undermined at home. The main barrier discussed by both staff and parents included socioeconomic status, particularly in terms of the lower level of education associated with more deprived families.

> *"I'm sure **it's not easy for lots of families** and it's just sometimes it's just perpetuated, the habits are perpetuated through the generations but working together, I suppose is the way forward isn't it?" Woodlands School, Wellbeing Lead*

> *"(…) But it is hard, **it's not as easy as what it could be because things are so expensive.** The better stuff what you could buy, healthier stuff is more expensive than the rubbish stuff isn't it?" Highbridge School, Parent interview 3, female, member of staff, Lead Learning Coach*

This is consistent with the definition of schools as CASs (Keshavarz et al., 2010); schools are open systems that are constantly interacting with different systems. Thus, the behaviour of the school system is influenced by both parents and the community and is constantly adapting according to need. Furthermore, whilst deprivation presents a barrier to families promoting health, previous research has shown that schools find it harder to engage more deprived families (McNeal, 1999).

Despite the passive models for engaging parents described within the previous section, many schools reported actively employing different mechanisms to target more deprived parents. These included strategies such as a contract to success,

employing a Family Liaison Officer and running parent workshops and cooking classes.

> *"(…) we've got a family engagement officer here and* ***those children who are particularly vulnerable for whatever reason are highlighted on transition*** *and we carry on working with those families throughout Year 7 and onwards up throughout the school." Woodlands School, Wellbeing Lead*

> *"(…) we've done things before where they've sent letters to parents to get them involved with the kids as well like workshops and things." Woodlands School, Parent interview 2, Female, member of staff, role unknown*

These strategies comprise internal structures (the structural context of action within the school gates), which may influence parents' intrinsic factors (general dispositions and knowledge of how they should act) and their perceptions of the strategic terrain, in terms of norms and power, which may, in turn, encourage them to communicate with the school (Stones, 2005).

Several parents from the most deprived school, who also worked within the school, reported that mechanisms were in place to engage parents of a low socioeconomic status. One parent reported that extreme measures were put into place, such as a texting service for those with no credit on their phone and transport for parents from their home (when they have no other mode of transport available) to allow them to attend meetings. This demonstrates a response to the high level of need within a more deprived school.

> *"We have got a texting service so* ***if parents haven't got credit sometimes they have so many texts or I don't really know how it works so they can text the school, 'can you ask so-and-so to ring me'****. If they're having problems, if they need to come up for a meeting* ***we've been known to go and pick parents up and bring them in for a meeting*** *and then take them home you know or give them the money*

for bus fares (…)" Highbridge School, Parent interview 3, Female, Member of staff, Lead Learning Coach

Students from Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) provided an example of parents enforcing rules at home due to the school communicating with parents regarding health policy. This may help to extend the school ethos and core values into the home and align both formal and informal rules (Keshavarz et al., 2010).

"Like say now we just have like a bottle of Sprite or something, they confiscate the bottle and you don't get it back. ***Because my Mum found out about this rule, she made me do the same in my house****. I'm not allowed to eat junk food, I have to eat all healthy like salads and stuff." Oakwood School, Student interview 1, Year 11 and Year 7 boys*

Year 9 girls proposed that this communication could have a role in stimulating conversations about school between parents and children, thus encouraging communication and alignment between systems (Keshavarz et al., 2010; Markham & Aveyard, 2003).

"(…) the school should inform them more often what they're doing so like parents have at least something to talk about with them." Woodlands School, Student Interview 3, Year 9 girls

"(…) They should have like more parents evenings because ***then the teachers get to know the parents better*** *and then they know if the student is actually taking their behaviour from their parents and if the parent is like a bad influence towards the pupils." Woodlands School, Student interview 3, Year 9 girls*

These results show that an array of mechanisms are in place, particularly in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1), who were reported in Chapters 5 and 6 to have the highest level of both deprivation

and engagement with SHRN as well as the most organised wellbeing structure. However, it is notoriously difficult to engage more deprived families and the most effective method of achieving this still remains unclear (McNeal, 1999).

Working with outside agencies and non-teaching staff to engage parents

Schools reported that non-teaching staff with roles dedicated to wellbeing were used by some schools as brokers to promote parental engagement (Burt, 2004b). This may be an example of schools changing internal structures (the structural context of action within the school gates) in order to facilitate information flow or self-organisation in response to need (Keshavarz et al., 2010; Stones, 2005).

> *"Parents, that's a daily basis, because I ring parents and they ring me so it's, so parents daily, then grandparents, there are a lot of grandparents who are responsible for the children." Oakwood School, School Nurse*

> *"we've got two people sat on a wellbeing desk who see the children if there are any issues they liaise with parents and then back to head of years and so on and then possibly if it's a child protection issue it goes as far as the Assistant Head." Greenfield School, Student Support Manager*

Parents from Greenfield (engagement rank 4, education rank 2, embeddedness rank 3), Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) Schools supported this, reporting that they felt comfortable initiating contact with the school due to the presence of non-teaching staff, such as the Wellbeing Desk in Greenfield and the School Nurse in Oakwood School.

> *"(…) each individual one [year group] has got their own Pastoral Support Officer so that they, as well as the Wellbeing Manager, so they're on the end of the phone all day so it's not like they've got a teaching timetable because they haven't so* ***you can always get through to somebody and have a quick chat you know****?"*

Highbridge School, Parent interview 3, Female, Member of staff, Lead Learning Coach

The presence of a full time School Nurse was perceived to be useful for improving the health of deprived students due to the Nurse having time to have discussions with students about and to involve parents with issues such as, personal hygiene and dental health. This may help to provide a brokerage role (Burt, 2004b) to increase interactions between systems (Keshavarz et al., 2010) and potentially improve students' capacities for affiliation with other people by the presence of a non-teaching member of staff who will listen to their problems and help them to reach a solution (Markham & Aveyard, 2003).

"(…) I've sat in with a group with [School Nurse], talking about things, personal hygiene, brushing teeth, which for some children, they haven't got the parental support at home so it's sort of encouraging, you know, making them see how important it is. ***And I think a lot of that goes on is down to [name of School Nurse] and having a School Nurse****." Oakwood School, Learning Support Assistant*

This was supported by parents in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) who reported being able to directly contact the school to speak with the Nurse and provided examples of the Nurse involving parents in the resolution of problems. Parents also reported that Pastoral Officers in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) and the Wellbeing Desk in Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) provided non-teaching staff whom were open to contact during the day.

Highbridge School, a school with an above average level of deprivation, emphasised that their relationship with parents is especially important to ensure that the health of their students is protected during the school holidays, as well as in term time. They reported working with outside agencies in brokerage roles to achieve this.

"Our worry always is in school holidays and we put things into place with Communities First and, and our local Health Provision Unit, which is just down the road from here" Highbridge School, Wellbeing Lead

The Family Liaison Officer in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) and the Education Welfare Officer in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4), plus assorted outside agencies in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) were involved in travelling to see families and holding events on the school premises aimed specifically at more deprived parents.

"my EWO [Educational Welfare Officer] comes in two days a week to work with us and then I can phone her, even if she's in another school and I've got a real problem she will, because her other school is quite local, she will then come and pick children up or go and help parents who are basically struggling to get their children into school." Oakwood School, Wellbeing Lead

"well I don't know if it was aimed at just health, it was the first time we've done it, ***just reaching out to families who are hard to reach but I know that the family liaison officer****, the idea is obviously to gain an understanding about the parents and communicate with them first and there were activities around the school too, for them to take part in." Woodlands School, PE Teacher*

Again, this highlights the role of the school as an extension of the family and the pivotal brokerage role of non-teaching staff and outside agencies in enhancing the flow of resources, such as information between the school and parents (Burt, 2004b). Collaboration between systems (schools, parents and outside agencies) may facilitate the development of shared goals between the schools and related systems, such as parents and the community (Keshavarz et al., 2010). Moreover, this collaboration may be facilitated by the allocation of responsibility for health and wellbeing to a member of the SMT, the presence of a distributed leadership structure and the systematisation of non-teaching roles within this, as reported in Chapter 6.

7.2.5 Level of interaction with outside agencies

Many different outside agencies were reported within the ego networks in Chapter 6 to be connected to Wellbeing Leads. These included third sector agencies, such as Women's Aid, Local Authority-based agencies, such as Healthy Schools Coordinators and Social Services, and emergency services, such as the fire and police service. In line with this, qualitative data showed that schools reported varying interaction with outside agencies according to the level of need experienced. It was perceived by many staff to be important to involve outside agencies within the school wellbeing structure. For example, the only Healthy Schools Coordinator to take part in an interview worked with Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) and stressed the importance of building trusting relationships with schools to increase outside agency involvement. She reported that outside agencies should ensure that a reply is given as soon as possible, even if the answer is 'I don't know'.

> *"It's just about, I find, being able to give them answers to the questions when they do have them, being able to support them in the right way and being available when they need you. I think* ***schools are so busy, so when there's an open window, you have to jump on it to, even if it means juggling a few things around. Otherwise you can lose that sort of relationship with them****. So I think it's, yeah I always try and respond to emails straight away, sort of, as soon as I get them, and give, even if I can't answer the question then, it's about sending an email saying, 'I've had your email, I'm looking into it, I will get back to you with a solution' so showing schools that you can make a difference and you can support them is a key thing, I think" Greenfield School, Healthy Schools Coordinator*

She also reported that schools are not likely to prioritise something that is not aligned to their core values, especially if they do not trust the individual or organisation that is contacting them. Thus, the Healthy Schools Coordinator described how she acted as a gatekeeper for those agencies who had not yet built such relationships with the schools.

> *"(…) what I try to do, so* ***if there is someone new coming into the [Local Authority] that I've linked with that wants to get into schools, I say try and go through me*** *and I just send literally their email from my email address with their contact details on the back so that the school can just, but it is just for setting up that point of contact for them I suppose." Greenfield School, Healthy Schools Coordinator*

The Healthy Schools Coordinator for Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) also emphasised the need for programmes to be established in order for schools to buy in to the benefit of being involved due to the high number, and transient nature, of such initiatives.

Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) perceived the proximity of staff from outside agencies to be important in relationship building.

> *"So it's just some of the outside agencies that you feel are slightly less. Yeah, because they would be in and out, wouldn't they, but these people are on a daily basis. This is where it's all happening really isn't it" Highbridge School, Wellbeing Lead*

This is supported by the ego network analysis, within which the Wellbeing Lead in Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) reported interacting frequently with four out of eight outside agencies and also rated these as 'extremely important' in their ego network reported in Chapter 6. Moreover, several outside agencies were reported in Chapter 6, to be based on site with some even categorised as non-teaching staff in Highbridge School.

Whilst Highbridge School (the most deprived school) had several outside agencies co-located within their school, and were therefore proximal to the school, other case

study schools discussed the fact that they did not have the space or resources to do so. This may have hindered their collaboration and communication with outside agencies.

> *"That's why,* ***what we'd like here is for social services to be based in the school*** *because it's the only way forward and it's the same with the School Health Nurses, we need them in the school, there's no point them being in an office in [name of town] and many schools, like ours [names of schools], which was [name of school], have combined together and they've got plenty of room to base Social Services down there with them, and it is definitely the way forward" Oakwood School, Wellbeing Lead*

However, in their qualitative interviews, the PSE Teacher and School Nurse, both non-teaching staff in Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4), reported many interactions with outside agencies. This indicates a brokerage role between the systems of schools and outside agencies (Burt, 2004b). These findings suggest that co-location may not be necessary and are consistent with the fact that Highbridge (engagement rank 1, education rank 1, embeddedness rank 1) and Oakwood Schools were rated as having the highest levels of engagement with SHRN in Chapter 5. It may be that having non-teaching staff dedicated to health is sufficient, as they are likely to have more time than teaching staff to build relationships with and engage outside agencies.

Oakwood School also spoke of varied interaction with charities when exceptional issues with student wellbeing and safety arose. This is supported by the fact that, although the PSE Teacher and School Nurse reported that they interacted with most outside agencies infrequently, they each rated seven as 'extremely important' within their ego networks reported in Chapter 6.

> *"Barnardos, well it depends on circumstances because with Barnardos last year I was speaking to them every week, right, but this year I haven't actually spoken to them all term or last term." Oakwood School, Wellbeing Lead*

Moreover, the Healthy Schools Coordinator described Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) as 'proactive and engaged' and, therefore, did not require much interaction compared with other schools.

> *"(…) because they are so proactive and so engaged, I think in terms of myself linking with other people about [Greenfield School], it's fairly infrequent compared to a school that perhaps needs more support and more engagement then* ***we tend to discuss at meetings more the problem schools****, rather than the schools that are doing really well so." Greenfield School, Healthy Schools Coordinator*

This implies a duality of structure and agency whereby outside agencies provide a structure and adapt to the level of need and expression of agency by schools in accessing these services (Stones, 2005).

7.3 Conclusion

Whilst Chapters 5 and 6 enhanced the understanding of school system functioning and level of engagement with a collaborative research network, this chapter provided insight into how this functioning and engagement relates to health and wellbeing improvement practice and interactions with parents and outside agencies. Brokerage was found to be an important factor in facilitating information flow between departments to achieve the mapping of curriculum across subjects. All schools reported the existence of comprehensive PSE programmes in a variety of forms, although a naivety in relation to its assumed effect on health behaviour was evident. Advantages were perceived by all stakeholders to employing dedicated PSE Teachers and outside speakers to deliver PSE lessons, whilst embedded health messages within the curriculum may help to improve alignment and communication between subjects.

In terms of school ethos, stakeholders generally perceived the core values of the school in a positive light, with prioritisation of pastoral care and personal

development alongside education particularly evident within the most deprived case study school. This was perceived to be linked to staff perceptions of the synergistic relationship between health and education. Furthermore, student perceptions of teachers caring about them, staff responding quickly to wellbeing needs and having a genuine voice within the school led to a higher perception of safety and connectedness to the school.

On the one hand, there is an unequivocal perception of the need for trusting relationships to be established between the school, parents and outside agencies in order to align and enhance the delivery of health improvement to students. However, on the other hand, there are barriers which inhibit the ability of schools to communicate with parents and outside agencies. Despite this, all stakeholders perceive case study schools to employ multiple strategies to engage parents, particularly targeting more deprived families. This was most prominent within Highbridge (engagement rank 1, education rank 1, embeddedness rank 1), the school with the highest level of deprivation and the most highly organised health-related staffing structure reported in Chapter 6. The importance of parents perceiving the school to be open to communication and the pivotal role of non-teaching staff was emphasised. Moreover, the importance of students, non-teaching staff and outside agencies as brokers between the systems of school and parents was discussed. Overall, this chapter demonstrates the varied level of implementation of health improvement activities and system orientation aligned with each section of the HPS framework within case study schools.

8 Discussion

8.1 Chapter aims

This thesis has explored variance in health improvement processes and engagement with a new collaborative research network (SHRN) within different school systems. This chapter reflects on the findings presented within Chapters 5 to 7, linking these back to the literature introduced in Chapters 2 and 3, to understand how they have addressed the research questions explored in this thesis. The two main research questions were as follows:

1. How are efforts to engage schools in a discussion about health improvement impeded or facilitated by system characteristics?

2. How do school structures and informal social networks affect the embedding of health and wellbeing into complex school systems?

This chapter will begin in section 8.2 by situating the thesis in terms of how it has developed our understanding of the functioning of complex school systems in relation to what was already known. Sections 8.3-8.5 will discuss findings relating to research question 1 in the context of relevant literature, whilst section 8.6 will serve the same purpose for research question 2. After this, the chapter will reflect on the theoretical approach (Section 8.7) and research design and methodology (Section 8.8), before making recommendations for policy and practice (Section 8.9) and drawing conclusions from the thesis findings (Section 8.10).

8.2 Situating the thesis: Understanding the functioning of school health and wellbeing through complex systems lens

The thesis commenced with a discussion of the literature focusing on why schools are important settings for school health improvement, and how a theorisation of schools as complex systems can shape our understandings of how school systems function, and how interventions might elicit change. Chapter 2 identified adolescence as a key phase in the life course (Wichstrøm et al., 2013) and argued the

need for more evidence to demonstrate whether a link exists between health and educational outcomes to increase prioritisation of health and wellbeing in schools (Bonell et al., 2014; Littlecott et al., 2015). Further to this, school effects on health were identified (West et al., 2004). This pre-existing variance in student health between schools perhaps indicates that any attempts to intervene in school systems will interact with a diverse range of pre-existing activity across schools, which may act to impede or facilitate its integration and effects.

The WHO HPS Approach was introduced as a challenge to individualistic intervention paradigms through moving towards a settings approach, incorporating strategies at the educational, ethos and parental involvement levels (World Health Organization, 1986). However, negligible, modest or a lack of effects have been found as a result of many large scale trials of health improvement interventions (Thompson et al., 2003) and many authors have described an 'implementation gap', whereby interventions fail to be implemented into the reality of the school setting (Roberts-Gray et al., 2007; Rohrbach et al., 2006). This implementation gap has been identified within the HPS approach; due to implementation challenges where attempting to bring about more structural change, interventions theorised at multiple levels may in some cases be boiled down to health education when implemented in practice. While adding health topics to the curriculum is relatively straightforward, higher level changes have proven challenging to implement (Langford et al., 2014). Indeed, the "minimally disruptive" nature of health education, in terms of impact on school systems, is perhaps why they have been favoured to date, though perhaps simultaneously why they have failed to disrupt entrenched patterns of health and inequality (Hawe, 2015). There remains a substantial need therefore to better understand the challenges in achieving change within schools, which from a systems perspective, must begin with understanding how they currently function.

Recent years have seen increasing movement towards viewing complex interventions not simply as the 'installation' of something new into a system, but as events within complex systems (Hawe et al., 2009b). From this perspective complexity of the system, and of change efforts within it, are foregrounded as primary foci of study. Complex interventions are defined by Hawe (2009b) as

critical events or something significant that happens within systems that trigger an evolution of new structures, new and emerging networks, new and changing relationships and redistribution of resources. This shift in thinking therefore requires a fundamental change in how school health intervention design is approached. Thus, this supports the need to obtain an understanding of initial system functioning to inform intervention design. Moreover, it supports the need to design a standardised process, which can be adapted to context without compromising intervention logic. To do this there is first a need to step back and obtain a deeper understanding of how schools currently function in relation to health improvement, prior to attempting to implement change.

Schools possess many characteristics of CAS; they comprise diverse and ever changing agents, are nested within supra-systems such as Local Education Authorities, and comprise numerous sub-systems (Keshavarz et al., 2010). Schools have rules and ethos and well developed mechanisms for prioritising information related to 'core business', while internal and external monitoring structures provide feedback loops and inform subsequent practice. They also have the freedom to act within a limited set of possibilities. Co-evolution is continual, whilst external intervention is likely to result in non-linear and unpredictable outcomes. System functioning emerges as a product of the interplay of the characteristics described above (Keshavarz et al., 2010). Overall, this thesis offers an insight into how schools function as CASs in terms of health and wellbeing.

Despite the extant and rapidly expanding literature advocating the use of a CAS thinking in public health (Best & Holmes, 2010; Hawe et al., 2009b), this approach has yet to be widely implemented and there remains much ambiguity regarding its operationalisation (Carey et al., 2015). Therefore, the initial literature review within this thesis, also helped to inform study design and the incorporation of certain methodologies through investigating the extent to which methods were consistent with CAS thinking. Moreover, this helped to identify a theory gap whereby CAS thinking has not yet been fully practically applied within health research, and individualistic theories are often employed to underpin whole school approaches (Brainard & Hunter, 2016). Therefore, within this thesis, a CAS framework was

employed, with several other theories layered within it, with a view to obtaining a more complete understanding of the variance in complex school system functioning. These theories included Strong Structuration Theory (Stones, 2005), Structural Hole Theory (Burt, 2004b) and the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003).

Interventions can be viewed as attempts to influence social interactions. For example, interventions may aim to bridge structural holes and increase collaboration between sub-systems (Burt, 2004b; Hawe et al., 2009b). In light of this, Hawe & Ghali (2008) emphasise the need to understand pre-existing relationships and strategic positions of key players within a setting to assess how an intervention may change social structures, to track progress and to increase the likelihood of success or sustainability of such interventions. They propose that this should be undertaken as part of an assessment of the school environment alongside qualitative methods, such as interviews and focus groups prior to intervening (Hawe & Ghali, 2008). Moreover, in order to adhere to CAS thinking, it is important to consider the fact that CASs are unbounded, often interacting with many external systems, sub-systems and overarching supra-systems. Thus, this involves venturing outside the physical boundaries of a school (Chadderton & Torrance, 2011; Hetherington, 2013). In light of this, ego network methodology was employed within the current thesis to capture interactions with actors outside of the school system.

Hawe and Ghali (2008) advocate that flexible qualitative methods, such as interviews and case studies, should be conducted alongside social network analysis to obtain an in-depth understanding of the pre-intervention context from the perspective of multiple actors. This could form part of an in-depth case study, a methodology that has been endorsed by researchers in the field of education, as aligned with CAS thinking (Byrne, 2005; Haggis, 2010). Thus, as well as conducting a survey to obtain an overview of the context, the current thesis conducted ego social network analysis alongside semi-structured interviews with staff, students and parents within four in-depth case study schools.

8.3 Understanding variability in the extent to which schools engaged with a collaborative research network

Interventions can be conceived as an attempt to introduce change into a system. Often standardised interventions are designed to be implemented in the same way in every school, thus resulting in an 'implementation gap' whereby health interventions fail to be implemented into the reality of the school setting (Roberts-Gray et al., 2007). This demonstrates a need to investigate the context and functioning of systems to understand how any new intervention is likely to couple with its context and activate change. Data from this thesis provide insight into the coupling of a SHRN with differing school systems. For example, engagement with SHRN varied in terms of attendance at SHRN events and the seniority of the representative sent to these events. Moreover, schools' responses to SHRN feedback were highly variable in terms of the reading, interpretation, perceptions of potential value, new ideas generated and the extent to which feedback was distributed and discussed throughout school systems. Similar outcomes have been reported in relation to provision of educational feedback (Schildkamp & Teddlie, 2008; Vanhoof et al., 2012). Case study schools represented a continuum of variability in terms of engagement with SHRN. Highbridge School demonstrated a very high level, Oakwood a high level, Woodlands a medium and Greenfield a low level of engagement. Qualitative data highlighted that SHRN data had achieved a limited degree of permeation into school systems at the time of data collection, showing limited distribution and discussion in many schools and reporting that many key agents had not read the reports.

Overall, survey and qualitative results demonstrated schools' enthusiasm about the potential value of SHRN for facilitating locally tailored health action planning. Moreover many, including Woodlands and Highbridge, case study schools expressed confidence that reports would have far reaching implications for the functioning of school systems, in terms of shaping future health improvement. While over a third felt that they would not need outside support to bring about change, including the case study schools with the lowest levels of discussion and distribution, Greenfield, Woodlands and Oakwood. This high level of confidence appeared at odds with the fact that many key change agents had not received, read or distributed the reports some months after their initial communication. Hence, supporting school staff in understanding the challenges associated with harnessing existing system dynamics

and bringing about system changes (Hawe, 2015), while avoiding portraying this as unachievable, may be important in maximising impact of feedback on practice. To date, within academia and school health practice, challenges achieving system change have been widely underestimated. This is reflected in the inattention to implementation within evaluation studies (Langford et al., 2015), and a tendency to work with agencies who have a deep understanding of health topic areas, but less understanding of organisational change (Teutsch et al., 2015).

Qualitative data provided some possible explanations for the limited tangible action, discussion and distribution of results throughout school systems. This included the discussion of many barriers, both internal and external to the school, to converting the feedback report data into tangible action. Barriers included time and workload pressures and limited collaboration with and support from outside agencies. This indication of the need for support contrasts against survey results which showed Greenfield (engagement rank 4, education rank 2, embeddedness rank 3), Oakwood (engagement rank 2, education rank 3, embeddedness rank 4) and Woodlands (engagement rank 3, education rank 4, embeddedness rank 2) Schools to report that they were 'not at all likely' and 'not likely' to require extra support to take tangible action from the SHRN health reports. However, this may be due to the nature of the closed questions utilised within the survey, compared to the chance to elicit the intricacies of opinions on this matter within qualitative interviews. The qualitative reports are supported by education literature. This shows us that passively providing data is unlikely to change school practice by itself (Ebbeler, Poortman & Schildkamp, 2015); this requires more active engagement, working with complex school systems to facilitate data interpretation and the identification of contextually appropriate evidence informed responses.

There are examples of effective efforts to actively engage with schools to this end from the UK and beyond. In Canada, trained School Health Facilitators supported dissemination, translation and application of feedback data to APPLE schools, which resulted in positive impacts on obesogenic behaviour (Fung et al., 2012; Schwartz et al., 2010). School action research groups have been used in Australia within the Gatehouse Project (Bond et al., 2004; Bonell et al., 2015), in Canada within CORE

(Hawe et al., 2015a) and in South East England, in Inclusive (Fletcher et al., 2015). These interventions incorporated facilitators who were experienced educators (Gatehouse and CORE), practitioners (APPLE) or academics (Inclusive), who provided outside support for schools to take action. However, such models are expensive and resource intensive; APPLE involved creation of a new full-time post in every school. Hence, there is a need to understand whether, through greater partnership working, existing infrastructure for overseeing health at levels beyond individual schools can be capitalised upon to make this process more efficient. For example, local authorities could be harnessed to support data-led needs assessment and evidence informed action planning in a sustainable and scalable manner. This may help to systematise health improvement, facilitating the prioritisation of info which is relevant to each complex school system's requirements (Hawe et al., 2009b; Keshavarz et al., 2010).

8.4 Understanding school staffing and leadership structures

Variability in schools' responses to SHRN and use of its feedback may reflect characteristics of individuals with responsibility for health, in terms of attitude, commitment to health improvement, and willingness or ability to use research data (Vanhoof, Verhaeghe, Verhaeghe, Valcke & Van Petegem, 2011). However, it may also relate in large part to the position of key actors within their social networks and the impact of this upon system functioning (Hawe & Ghali, 2008). Senior management commitment has been shown to be important to facilitate implementation of school health improvement (Gugglberger & Dür, 2011; Roberts et al., 2015). The role of a distributed leadership model, whereby SMT support is provided, but certain roles are delegated to other members of staff, in the implementation of school health interventions has also been demonstrated within qualitative studies (Pearson et al., 2015; Roberts et al., 2015; Samdal & Rowling, 2011; Spillane, Halverson & Diamond, 2004). Distributed leadership has also been shown to increase teacher commitment (Hulpia, Devos & Rosseel, 2009) and sustainability through minimising the negative impact of a specific individual leaving the school (Hite, Reynolds & Hite, 2010). However, behaviours of individual agents within a complex system are influenced by the constraints and opportunities provided through their web of interactions (Valente, Unger & Johnson, 2005).

Findings from this thesis supported this, but also built upon previous qualitative literature through combining interview data with ego network analysis and employing a complex systems lens with Strong Structuration Theory (Stones, 2005), Structural Hole Theory (Burt, 2004b) and the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003) within this. Moreover, these findings were analysed according to each case study schools' engagement with the SHRN feedback report.

8.4.1 Staffing structures and SMT commitment to health

Within the current thesis, social networks, and the brokerage positions of key agents within them, perhaps impacted whether key agents received feedback reports (Burt, 2004b; Hawe & Ghali, 2008). These factors may have also affected the extent to which this information continued to flow through the system and interactions within and between systems (Keshavarz et al., 2010), perhaps due to the interaction between these social network structures, the intrinsic factors that agents possess and agency (Stones, 2005). In support of this, a study of school reform employing whole network analysis observed distinctly different patterns of interactions and engagement with reform between schools (Daly, 2012; Daly & Finnigan, 2010), thus highlighting a need to take into account relationships when designing interventions (Valente, 2012; Valente et al., 2005). Notably, SHRN reports were initially sent to Head Teachers during the first round of feedback reports in 2014, none of whom completed the survey. Hence, all participants were at least one step removed from the original communication. This process has been altered within the subsequent round of reports in 2016, with reports now being sent to the main contact member of staff.

Nevertheless, almost all members of the SMT who completed the survey reported receiving the reports; four Wellbeing Leads reported that they did not receive their report, all of whom were not part of the SMT. Thus, feedback reports were almost universally shared with other SMT members, though information flow sometimes broke down before reaching Wellbeing Leads, where they sat outside of the SMT. Wellbeing Leads were also less likely than SMT members to have read reports fully; these were perhaps read and discussed at SMT meetings from which those

Wellbeing Leads outside of the SMT were excluded. Previous research has shown that SMT buy-in is vital for organisational development and information flow, and the implementation of facilitative practices and structures related to resource allocation for professional development and teacher collaboration and exchange, such as action groups (Coburn, 2005). Therefore, SMT commitment to health may have predicted the likelihood of health feedback reaching the Wellbeing Lead or, indeed, inclusion of the role of Wellbeing Lead within the SMT. This was also implied within the social network analysis and qualitative results, which highlighted the importance of brokerage roles within the SMT.

Consistent with previous education-based studies of teacher collaboration (Moolenaar, 2012), there was substantial heterogeneity between case studies in terms of network centrality. Moreover, Woodlands and Oakwood Schools had a higher number of cliques (19 and 22, respectively). Although this was perhaps a function of the larger size of these school systems and the higher number of network ties; Woodlands had one clique for every seven ties and Oakwood had one clique for every six ties, by comparison to one per five in Highbridge and one in four in Greenfield School. Social networks are characterised by cliques of similar individuals (Newman & Park, 2003). The formation of cliques may be problematic when these represent clusters of insular, homogenous groups with limited communication between them, as seen in Woodlands School. However, cliques can serve a functional purpose where sufficient brokerage exists between them, such as when they are connected through weak ties.

Burt (2004a) posits that brokerage can facilitate the development of social capital and good ideas through allowing individuals in brokerage positions to experience alternative views and behaviour. Building upon this, the theory of the strength of weak ties indicates that weak ties may play an important brokerage role in connecting cliques to other parts of the network (Granovetter, 1973). These structural characteristics are crucial in facilitating and limiting the flow of resources, such as information about wellbeing throughout a school. One study of three mental health networks showed that integration within small cliques with overlapping links between them was related to network effectiveness (Provan & Sebastian, 1998). In

all case study schools, at least some alters in influential brokerage positions (i.e those with the highest betweenness centraility scores) were members of the SMT, although the specific job roles of the most influential brokers varied between schools. By contrast to Hawe and Ghali's (2008) earlier study of social networks of school staff, the Head Teacher did not feature in the top five betweenness centrality scores for two out of four case study schools.

Moreover, Highbridge School had a core group consisting of the Head Teacher, Wellbeing Manager (non-teaching pastoral role), Wellbeing Lead (Deputy Head Teacher) and Safeguarding Officer who were all brokers in that network. Thus, this suggests that a highly organised wellbeing structure and nested system structure designed to facilitate brokerage, with the addition of Head Teacher buy-in, may help to facilitate the introduction of diverse information from outside and the flow of this information throughout the network (Burt, 1992). For example, this could include the discussion of health feedback, and the planning of subsequent related actions.

8.4.2 Allocation of leadership for health and wellbeing

Positions of Wellbeing Leads within these school networks differed in a number of potentially important ways, including length of service within the school, and access to the SMT. Frequencies and perceived importance of health-related interactions were greatest where Wellbeing Leads were more senior and had been at their school for longer. This perhaps afforded them greater access to key decision makers, and more time to establish social networks, thus potentially improving the efficiency of system functioning and orientation towards health and wellbeing. Wellbeing Leads who had been working at a school for >25 years may have had better knowledge of structures of signification. This refers to their knowledge of other agents in the school and how they would interpret their actions and subsequently exert their agency. Therefore, this may lead to a lower level of unintended consequences (Stones, 2005). Thus, although information flow through school systems may be greatest where responsibility for health improvement is allocated to a member of the SMT, the specific members of staff best positioned to act as brokers for health improvement vary between schools.

Qualitative insights highlighted variation in perceptions of the efficacy of allocating the role of Wellbeing Lead to a senior member of staff with the power to make changes within the school or a more junior member of staff who was able to dedicate more resources to the role. However, we should not make the mistake of over-simplifying this process. Agents arrive at a context with many other external structures influencing their intrinsic factors from other spheres of their lives, such as their family circumstances. These influences will inevitably interact to affect agents' decision-making and practice within the school (Stones, 2005). It was suggested that combining the above approaches in a distributed leadership model may be most effective, whereby the main Wellbeing Lead role is allocated to a member of the SMT. This creates a model of a 'team structure' in which there is both a clear overview of health improvement, but where specific roles are delegated among actors within the system, with ties between these various agents and groups. Harris (2004) identified barriers to distributed leadership in school improvement. These included the need for teachers in formal leadership to relinquish control over activity and the need to remunerate staff when they take on extra responsibility. Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) may represent a more secure school system due to the highly organised system and shared roles for wellbeing meaning that, if one person were to leave, the system may not be compromised to the extent as might be the case in the other three case study schools.

This suggests that collaborating with a wide range of stakeholders, potentially in the form of an action group, may facilitate the interpretation and use of the feedback reports within complex school systems. Moreover, harnessing these services and creating dedicated non-teaching roles for wellbeing may be key facilitators of creating a HPS system. This is supported by previous research which found that the provision of evidence summaries and extra support from stakeholders may help to increase action in the form of evidence-based practice (Sharples, 2015). Further support comes from Inchley et al. (2007), who conducted a mixed methods process evaluation of two schools attempting to implement a HPS approach. They found that the allocation of responsibility to a member of the SMT helped to embed health into the school and facilitated the delegation of responsibility and liaison with outside agencies. In contrast they found a reliance upon leaders' commitment and ability to

convey enthusiasm to others where the role was allocated to a member of teaching staff outside of the SMT (Inchley et al., 2007). This is aligned with the case study schools' rankings for embeddedness of health in the curriculum. These showed the highest scores for Highbridge (embeddedness rank 1) and Oakwood (embeddedness rank 2) both of whom had allocated the role of Wellbeing Lead to a Deputy Head Teacher. In contrast, the two schools with the lowest rankings for embeddedness had allocated an Assistant Head (who had been newly promoted into the SMT) and a PE Teacher to this role.

In contrast, Moore et al. (2016) conducted quantitative analyses of school commitment to health, finding no correlation between allocation of leadership to teaching staff versus a member of the SMT and the implementation of health improvement. However, organisational commitment to health, in terms of SMT overview of health improvement, was substantially correlated with health improvement actions. Thus, this implies the importance of support for the leader from the SMT, as opposed to placement of the role within this group (Moore et al., 2016). Further research is required to compare and contrast team structures and their impact on system functioning across a larger number of schools. In addition to this, the importance of allocating a single lead role for wellbeing was found, with the likelihood of having written action plans in place increasing where a single lead, as opposed to multiple leads, had been allocated (Moore et al., 2016).

In summary, the school who engaged to the greatest extent with the health feedback (Highbridge: engagement rank 1, education rank 1, embeddedness rank 1) was characterised by a highly organised health related social network, with multiple roles relating to health to whom all members of the network were connected. It was also characterised by a high level collaboration with and embedding of outside agencies, comprising frequent interactions and perceived as serving important roles in promoting health. Within this school, the Head Teacher played a leading role in brokering health improvement interactions, with almost all alters connected to the SMT. This is indicative of a system that is oriented towards health improvement. Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4), which had the second highest level of engagement with SHRN, was characterised by

a Head Teacher with a top five brokerage position and collaboration with many outside agencies, although most of these were only tied to the Wellbeing Lead (Deputy Head) and students.

Of the two schools engaging least with the feedback, Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) was characterised by fewer ties considered to be important, while the Head Teacher played a less central brokerage role for health improvement and outside agencies were connected to the school through Heads of Year and two Assistant Head Teachers. The final, less engaged, school (Greenfield: engagement rank 4, education rank 2, embeddedness rank 3) allocated the Wellbeing Lead role to a more junior member of staff, who reported more limited brokerage by senior staff, and a limited role of outside agencies within their network. Neither the Head Teacher of Deputy Head were included within this ego network, thus indicating a complex school system where health and wellbeing did not appear to be fully embedded.

8.5 Understanding schools' interactions with students and structures for student voice

Alongside the importance of staffing structure, student voice was also discussed as a prominent issue in school health. The importance of student voice has been demonstrated by research showing its link to a positive school ethos (Mager & Nowak, 2012). Within previous research, student voice has been shown to be an important factor for increasing school connectedness (Langford et al., 2014). However, a need to employ multiple methods in order to promote inclusion of all students, rather than solely those directly involved in a school council, has also been demonstrated (Griebler, Rojatz, Simovska & Forster, 2014). Research has also shown a need for SMT support for action to be taken as a result of student voice (Fletcher et al., 2015). The current thesis employs a complex systems lens to support and expand upon these findings in relation to student voice in general, as well as in relation to the utilisation of SHRN feedback report data.

Due to a perception of student councils as unrepresentative, all schools identified the need for multiple mechanisms, including opportunities for confidential input to be

put in place to facilitate student voice and erode barriers between staff and students (Markham & Aveyard, 2003). This was supported by Fletcher et al. (2015) who reported that, within the Inclusive study, both staff and students were open to inclusion of students in an action group and perceived this as an alternative to unrepresentative student councils. Indeed a diverse selection of students were recruited and retained within the action group and significant student-led changes were implemented in all schools (Fletcher et al., 2015).

The role of SMT involvement in change initiation within the school system, and the need for student voice to facilitate meaningful input for students to shape the school environment, was perceived to be important by all stakeholders. There was also a perceived need for a team structure to include non-teaching staff with wellbeing-related roles for wellbeing to become more prominent within the school. This highlighted the importance of brokerage roles to encourage student involvement and break down barriers between groups of stakeholders (Burt, 2004b; Markham & Aveyard, 2003). It was perceived that it was not possible to make every change suggested by students as sometimes there are pragmatic decisions to be made or student suggestions are not feasible. Thus, there is a need for further research to establish how schools manage student expectations in terms of how much influence they have in the school. This could also help to establish the extent to which this contributes to the creation of committed students (Markham & Aveyard, 2003).

Within the qualitative data the potential use of the SHRN feedback reports within student voice was discussed. Moreover, the perception of these reports as a form of student voice in themselves, leading to the potential for teachers to gain an informed insight into student behaviour, was also discussed. This is supported by Fielding (2004), who advocates for collaboration with students as co-researchers within student voice. He argues that this approach may have the greatest potential for achieving student-led change due to co-production and discussion between students and teachers (Fielding, 2004). However, whilst the use of the SHRN feedback report data with students was viewed as a positive activity, some parents and students did not believe that simply showing the data to students would elicit behaviour change. Qualitative data also elicited the discussion of barriers to sharing data with students.

These included iatrogenic effects, such as angst among those students partaking in unhealthy behaviours if results were to be shared, despite having complete anonymity.

Conflicting views were found in Woodlands School (engagement rank 3, education rank 4, embeddedness rank 2) between the Wellbeing Lead, who was an Assistant Head and the Head of Science and Student Voice, who reported a more positive outlook. This may have arisen from the Head of Student Voice having a vested interest in this being perceived as successful, or from superior knowledge of student voice structures due to direct involvement. Moreover, students reported limited discussion in relation to health and wellbeing within student voice. Whilst this may demonstrate a prominence of other issues, it could possibly indicate a more integrated approach to school health, whereby health is not treated as a separate entity. This may have resulted in an underestimation of a health and wellbeing focus by students.

8.6 Understanding between-school variance in health improvement activity

8.6.1 Understanding variance in the integration of health into the curriculum

Health across the curriculum

Within the current thesis, qualitative data showed variance in the embedding of health into the curriculum between case studies, with the most engaged school showing the highest score. Health and wellbeing was reported to be used as a tool to weaken boundaries between subjects (Markham & Aveyard, 2003), showing little variance between case study schools. This sits in contrary to the variance observed in engagement with SHRN within case study schools and may be partly due to the comparative ease of changing the educational curriculum (Langford et al., 2014). The finding that the mapping of health across the curriculum may have been facilitated by senior management commitment to health is supported by previous research demonstrating that this group generally possess more authority to elicit action from teaching staff (Timperley, 2005).

Furthermore, findings from this thesis demonstrate potential for the use of SHRN health feedback reports to facilitate the integration of health topics into the core subjects, such as Mathematics, English and Welsh Baccalaureate. By approaching many topics from different angles within different subject areas, students' capacities for practical reasoning may be improved through a greater ability to view knowledge as multiple and often conflicting realities and through an increased understanding that knowledge is socially constructed (Markham & Aveyard, 2003). Despite the limited variance between case study schools, rankings of embeddedness of physical and mental health in the curriculum reflected data on school engagement with SHRN, and organisational structure, reported in Chapters 5 and 6. For example, Greenfield School (engagement rank 4, education rank 2, embeddedness rank 3) was ranked fourth for embeddedness of physical health, which is consistent with the finding that they engaged least with SHRN as well as their allocation of the role of Wellbeing Lead to a more junior member of staff, who reported limited interaction with the SMT in her ego network. In addition, the finding that Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) had the highest score for embeddedness of physical and mental health in the curriculum reflects their clear position as a positive outlier in terms of engagement with SHRN, and reflects the presence of a highly organised wellbeing structure.

Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) was ranked fourth for overall embeddedness of health in the curriculum, which was inconsistent with their rank of second for engagement with SHRN. However, this ranking was consistent with the limited team structure for health and wellbeing reported within the Wellbeing Lead's ego network. This may be indicative of a school which is in the early stages of reorienting the system towards health, as reflected within the qualitative data in this thesis. Another possible explanation for this inconsistency may be that Oakwood School was not a member of SHRN during the initial data collection. Thus, their level of engagement may have increased in the time between collection of data on embeddedness of health and engagement with SHRN.

Whilst literature shows that schools have a tendency to focus on educating students about health, as this is most in concordance with their core skills of education (Bonell et al., 2014), previous research has observed negligible effects of health education upon health behavior (Langford et al., 2014; Thomas & Perera, 2006). This is aligned with the findings that Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) had a highly organised wellbeing structure in place to facilitate the orientation of the school system towards health, alongside the highest level of engagement with SHRN and embeddedness of school health. Whilst embedding health throughout the curriculum may represent an extension of a healthy school ethos, these findings suggest the need for wider structural changes in policy, ethos and structures to encourage positive relationships with students and parents to be implemented alongside this.

Personal and Social Education

This thesis showed variance in the structure of PSE programmes within case study schools, with the three schools with the highest engagement with SHRN reporting PSE to be a part of school life on a weekly, as opposed to monthly, basis. On the one hand, if PSE is not a part of school life on a weekly basis, it is possible that it may not contribute as much as it could to harnessing the system to reorient it towards health (Keshavarz et al., 2010). Whereas, on the other hand, it could be that a dedicated monthly 'PSE day' may demonstrate greater school commitment to health due to the logistical difficulty in organisation. This may also make PSE provision more visible in the school which, according to Dooris' et al. (2012), may have symbolic value in establishing health as part of the role of the school.

Findings from the current thesis demonstrated reservations regarding the delivery of contentious and/or sensitive subjects within PSE curriculum by teaching staff. This was due to the risk of health messages being undermined if teachers felt uncomfortable teaching, or if students do not view teachers as a credible source of information on sensitive topics. This is supported by the fact that Oakwood School (engagement rank 2, education rank 3, embeddedness rank 4) had employed a dedicated PSE Teacher. Moreover, previous qualitative research on a drug education programme, part delivered through PSE in secondary schools in South Wales

showed that teachers reported a lack of skills, confidence and commitment to participatory teaching methods as a barrier to delivery. Teachers also reported feeling under confident and feeling that their input to the programme would be counterproductive due to a lack of desire to teach the subject and the perception that students knew more about the topic than they did (Bishop, Whitear & Brown, 2001). Whilst no schools in the study had a specialist PSE teacher, a higher level of confidence was reported where schools had a stable PSE team made up of class teachers who delivered PSE year after year and received specialist training (Bishop et al., 2001). This is further supported by a meta-ethnography on the delivery of sex and relationships education, which concluded that this should be delivered by experts, as opposed to teachers (Pound, Langford & Campbell, 2016).

8.6.2 Understanding variance in the creation of a healthy school ethos

In line with the previous section, there was also little variance demonstrated between case studies in terms of school ethos within the qualitative data. However, the quantitative rankings on the number of health areas covered by written policies, a proxy for school commitment to health, did vary between case study schools. Within this, Highbridge, Woodlands and Greenfield were ranked joint highest (5), and Oakwood fourth (2). Qualitative results suggested that a school ethos that promotes health and wellbeing, and is aligned to the assumption that health and education are synergistic as opposed to competing priorities, could maximise the number of committed and minimise the number of alienated students (Markham & Aveyard, 2003). This has been previously postulated within Dooris' work of a whole system approach, where he states that this approach should integrate health into the culture, routine life and core business of the setting (Dooris, 2006).

Findings from the current thesis showed that the allocation of the role of Wellbeing Lead to the SMT may help to enhance the prioritisation of health and wellbeing and engagement with SHRN within school systems. The finding that the SHRN Manager reported 'wellbeing is core to the way Highbridge School thinks' shows that this may be key. This is especially pertinent since Highbridge School (engagement rank 1, education rank 1, embeddedness rank 1) had the highest level of engagement with SHRN and had the highest level of relative educational attainment and

embeddedness of health of all four case study schools. Thus, the development of a healthy school ethos and the orientation of complex school systems to school health may help to facilitate the prioritisation of SHRN or similar health and wellbeing-related feedback. This was also reflected in the highly organised staffing structure reported to be in place in Highbridge School.

The development of a healthy school ethos may contribute to breaking down the boundary between students and teachers and subsequently improving their competencies (Markham & Aveyard, 2003). Furthermore, the provision of these structural resources may improve students' normative expectations around how the school deals with wellbeing issues and their likely impact on school functioning through student voice and changing staff attitudes. This may, in turn, encourage students, staff and parents to exert their agency by taking action to tackle wellbeing issues. This is due to knowing where to go, who to go to and having a process by which a team is in place to tackle these issues. For example, it was shown that many of the case study schools have dedicated staff or space for students to go to with their wellbeing issues. Indeed, previous research has demonstrated the perceived importance of dedicated space for wellbeing services, such as sexual health clinics, in that it reflects the importance that the school attributes to the service and protects confidentiality (Formby, Hirst, Owen, Hayter & Stapleton, 2010). This may provide feedback loops in terms of signalling to students that this is an important and confidential service. Moreover, if successful in improving sexual health and teenage pregnancy, this may increase the likelihood of this service continuing and becoming embedded within the complex school system (Keshavarz et al., 2010).

The fact that many students reported that the rules, core values and caring teachers lead to them feeling safe and feeling increased connectedness to the school is consistent with previous research. This has shown connectedness to be related to positive health behaviours (Hawkins, Kosterman, Catalano, Hill & Abbott, 2005; Stewart, McWhirter, Rowe, Stewart & Patterson, 2007). Indeed, the Gatehouse Project aimed to improve school ethos to promote wellbeing through a survey assessment of the school environment, a school-based health team and the implementation of strategies selected in accordance to the need of each school (Bond

et al., 2004). Within this thesis, the perception of a link between health and educational outcomes was reported to contribute to the value attributed to health and wellbeing by school staff. As achieving educational outcomes is the core aim of schools, health improvement activity has historically been viewed as something that detracts from their achievement of this (Bonell et al., 2015). This highlights the need for further research to establish whether and to what extent a synergistic relationship exists between health and education. Support for this comes from the fact that quantitative figures showed Highbridge (engagement rank 1, education rank 1, embeddedness rank 1), the most deprived school with a free school meal entitlement of >40%, had a highly organised wellbeing team and strong pastoral support in place. It also had the highest level of engagement with SHRN and had educational attainment 19% higher than expected for similar schools. This belief is further supported by research linking health behaviours, such as breakfast consumption (Littlecott et al., 2015), and emotional wellbeing (Adelman & Taylor, 1998; Needham, Crosnoe & Muller, 2004), with education.

In alignment with the case of Highbridge School, research has shown that the higher the level of deprivation in a school, the more provision there is to deal with wellbeing and pastoral issues (Moore et al., 2016). This may have a positive effect on reducing inequalities between schools but could have implications for more deprived students attending more affluent schools (Moore & Littlecott, 2015), meaning that they miss out on extra resources aimed at more deprived students within more deprived schools. The importance of targeting health improvement for more deprived students is demonstrated by previous research which has shown socioeconomic status to be associated with lower levels of physical activity, poorer diet and higher smoking prevalence among adolescents (Hanson & Chen, 2007; Moore & Littlecott, 2015).

8.6.3 Understanding variance in engaging families and the community

There was also limited variance shown between case study schools with regards to parental engagement. Quantitative scores for parental involvement for schools in SHRN ranged from 0-12. Within this, Highbridge was ranked highest (9), Woodlands and Oakwood were joint second (8), and Greenfield fourth (7). In terms

of qualitative data mechanisms were reported to be in place within each school, but variances arose in that the most deprived schools reported having extra provision in place.

The high level of perceived influence of parents in this thesis is aligned with qualitative research focused on stakeholders' views of obesity prevention in early adolescence (Power, Bindler, Goetz & Daratha, 2010). Findings showed that adolescents perceived parents to have the largest influence over eating behaviour, due to their provision of food in the home. A study of substance use among adolescents also found that parental monitoring was a protective factor (Piko & Kovács, 2010). This emphasises the importance of engaging parents in school health to help ensure that their influence has a positive effect on students' health. This is supported by Bernstein (1975) who theorised the importance of consistency between school and family cultures and is also consistent with the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003). Bernstein theorised that middle class students are more likely to be 'committed' to the school due to the school culture acting as a natural extension of their family life (Bernstein, 1975). Despite this importance, in a review of the HPS approach, it was reported that parental involvement was an area of common implementation failure (Langford et al., 2014), thus suggesting insufficient interaction between systems (Keshavarz et al., 2010). This may be affected by the rules and ethos in place regarding parental involvement, as well as the nested system structure in terms of the requirements outlined by supra-systems and the organisation of sub-systems in the school to establish a point of contact for parents, elicit efficient information sharing and refer parents to appropriate members of staff (Keshavarz et al., 2010).

The importance of schools engaging families and the community has been highlighted by many studies (Bryk et al., 2010; Crozier & Davies, 2007). However, there are many barriers to effectively engaging this group, including schools perpetuating the normative values of white middle class parents and not acknowledging the fact that parents may want to be involved in different ways, and there is not an effective 'one size fits all' approach (Crozier & Davies, 2007). This is pertinent in light of the recent 2016 budget announcements by the Conservative

UK government, which outlined plans to make every school in England an academy with no obligation to include parental representation on their Board of Governors.

Within the qualitative results of this thesis, many students and staff were positive about sharing the SHRN feedback report data with parents. This communication could potentially be facilitated by building up relationships and trust with the parents (Velsor & Orozco, 2007). However, some possible side effects were raised, such as 'league table thinking', whereby parents use the data to decide which school to send their children to. Thus, results should be shared with caution and further research is needed to clarify the potential iatrogenic effects that are suggested conjecturally within these data and their possible effects on system functioning (Keshavarz et al., 2010). The threat of 'league table thinking' is a valid concern as, currently, social inequalities between schools are perpetuated by middle class families choosing not to send their children to schools whose educational performance is below the national average (Crozier et al., 2008). Such choices have also been found to be perpetuated by 'grapevine knowledge', thus suggesting that discussing results unofficially with parents may have an impact (Ball & Vincent, 1998). Therefore, further research is required to establish safe methods of sharing SHRN findings with parents.

Variance was evident between case studies in terms of the role of non-teaching staff, with a higher provision in those schools with a more organised wellbeing structure. For example, all three parents from Oakwood School were recruited by the School Nurse and were not members of staff, compared to the other three case studies who did not manage to recruit parents external to the school. Whilst the merit of School Nurses is supported by limited previous research, alongside the need for more quality research on this topic (Wainwright et al., 2000), a shortage has been reported in the UK. For example, in England in 2014 there were 1200 School Nurses serving 20,000 primary and secondary schools (Hagell et al., 2015).

Creating an informal ethos around the inclusion of parents and placing schools at the centre of a community were also identified by all four case study schools as important ways of engaging parents. This is supported by Bryk et al. (2010) who

identified five essential ingredients for school improvement, including having close ties with families and the community. Furthermore, outside agencies and non-teaching staff working within schools and after-school/summer programmes, such as those reported by Highbridge School (the most deprived school), can build links with the community (Bryk et al., 2010). Indeed, research has shown that non-teaching staff can be integral to the implementation of community-centered strategies to strengthen ties between schools and more deprived families (Velsor & Orozco, 2007), and to enhance collaboration with outside agencies (Vostanis et al., 2012). Understanding how schools build relationships with outside agencies, and their roles in health improvement, is an as yet understudied but important area for understanding the delivery of comprehensive health improvement (Teutsch et al., 2015)

Socioeconomic status and parental engagement

Parental engagement was shown to be particularly pertinent for engaging families of a lower SES with Highbridge (engagement rank 1, education rank 1, embeddedness rank 1), reporting that their school incorporates family health and wellbeing in response to the high level of need. This is supported by previous findings which show low socioeconomic status to be a barrier to engaging with parents in many schools (Velsor & Orozco, 2007). This is consistent with the highly organised wellbeing structure in Highbridge School and the fact that they reported having discussed the SHRN results with 'some' parents. Indeed, the Wellbeing Lead in Highbridge School, alongside Oakwood, reported the most frequent health and wellbeing-related interactions with parents. Highbridge School had the highest level of deprivation out of all case studies, with >40% free school meal entitlement, suggesting a response to the high level of need of their students. This school also engaged most with SHRN. This is supported by Lupton et al. (2005) who found that more deprived schools scored higher on student welfare, which could possibly be explained by persistent diversion of teaching time into pastoral activities. Moreover, Moore et al. (2015) conducted a quantitative analysis, finding that school commitment to health did not vary by socioeconomic status, although there was a non-significant trend towards more health improvement being delivered in more deprived schools, perhaps in response to the high level of need.

Highbridge School also had the highest relative educational attainment (i.e. the highest residual for KS3/4 attainment level after regression analyses accounting for variance between schools in FSM entitlement). Whilst diversion of time away from education into pastoral care is viewed as somewhat problematic by many teachers whose core aim is educational attainment (Bonell et al., 2014), the high level of relative educational attainment alongside commitment to pastoral care in Highbridge School, perhaps suggests that this concern is unfounded. However, further research is required to ascertain whether a link exists between health and educational attainment. Lupton et al. (2005) found that more deprived schools scored lower on educational attainment overall, although this did not account for socioeconomic status. Thus, authors argued for the need for context to be taken into account when judging attainment in schools, as the current thesis has done.

8.7 Reflections on theoretical approach

A key strength of this thesis is the operationalisation of CAS thinking (Hawe et al., 2009b). The literature review identified that CAS thinking has proliferated during the past 10 years (Hawe et al., 2009b) and that schools can be conceptualised as CASs (Keshavarz et al., 2010). However, it was also shown that CAS thinking is still often applied in a tokenistic manner and focused upon the complexity of interventions, as opposed to systems (Brainard & Hunter, 2016; Datta & Petticrew, 2013). Therefore, within the current thesis, a CAS framework was chosen, whilst several lower level theories were layered within this to facilitate the practical application of this approach and to obtain a comprehensive understanding of complex school system starting points. The use of Strong Structuration Theory (Stones, 2005) provided a more practically applicable framework compared to Structuration Theory (Giddens, 1984). Strong Structuration Theory accounts for the structures both internal and external to the school gates, as well as the intrinsic factors or individuals' general dispositions and understanding of how they should act and how these contribute to active agency and subsequent outcomes (Stones, 2005). In particular, this allowed for theorisation of the potential link between the school structure-related data collected through ego network analysis and qualitative perceptions of agency with data showing outcomes, such as schools' interactions

with SHRN feedback reports as well as what schools currently implement in terms of health and wellbeing. Furthermore, employing Structural Hole Theory (Burt, 2004b) facilitated a deeper understanding of the role of brokerage in facilitating information flow and system functioning, whilst the Theory of Health Promoting Schools and Human Functioning (Markham & Aveyard, 2003) allowed for theorisation of the potential effects of structures which break down boundaries between stakeholders on individual health outcomes.

Furthermore, the combination of critical realism and CAS has proven useful for understanding reality, or the initial conditions of different complex school systems. In much social science teaching and writing, quantitative methods are caricatured as being positivist, while qualitative methods are assumed to be constructionist (McEvoy & Richards, 2006). However, social research represents a collection of ideas and assumptions about the nature of reality, and how best to understand it, which often lie on a continuum rather than dichotomous paradigms (Bonell, 2013; Hammersley, 1995). Critical realism represents a common epistemological and ontological standpoint to facilitate the mixing of qualitative and quantitative methods (McEvoy & Richards, 2006). According to critical realism, reality is stratified into the 'real' (where all latent mechanisms reside), the 'actual' (what actually occurs) and the 'empirical' (what we can observe to acquire knowledge). Thus, critical realist positions assume a reality independent of our thinking, which it may not be possible to ever fully observe (Bhaskar, 1978). For example, school systems function in ways independent to our interpretation and understanding of this functioning. Research methods can allow us to make inferences about these realities, but do not provide a transparent window into reality and should be selected according to the demands of the research question. Adopting a generative view of cause and effect, which sees actions as producing outcomes in interaction with contextual circumstances, the foregrounding of context within this thesis is important for aligning with a critical realist perspective. This thesis has responded to critiques of the narrow focus of much intervention research (Campbell et al., 2000), by taking a step back to understand how systems function and how contextual circumstances shape school functioning. Social interventions operate within open systems that are permeable, malleable and subject

to changes in other systems (Houston, 2001). Thus, by mixing methods, this thesis has attempted to triangulate multiple perspectives to obtain a more in depth and complete insight into the reality of school system functioning (McEvoy & Richards, 2006), while accepting that a direct and unmediated insight into reality is unattainable.

8.8 Reflections on the research design and methodology

Participants had a choice of completing the survey online or on paper. While there was no evidence of biases by key school characteristics, only 50% of invited schools participated in the survey. Future research should investigate the reasons for non-response among schools.

Case studies were sampled pragmatically due to difficulty with recruitment. Whilst this did result in a good representation of different locations, size, socioeconomic composition and progression within the HPS framework, it may have resulted in the recruitment of more engaged schools or those who are not currently highly engaged but are motivated to improve. This is evidenced by the finding that, although there were a wide range of scores relating to the embeddedness of health within the school, three out of four case studies scored above the median. The small number of case study schools sampled did not allow for hypothesis testing (i.e. through linking variability in network constructs to variability in responses to feedback). However, they did provide an in-depth overview of the functioning of complex school systems and allowed the research questions to be successfully explored.

Ego-network analysis, while conferring key advantages over whole network analysis in that it enables interactions beyond the school gates to be captured, also makes assumptions regarding the importance of the Wellbeing Lead in ensuring the delivery of health improvement within school systems. Furthermore, the extent to which network characteristics are stable or in constant flux could not be captured. Allowing participants to name the nodes within their network, instead of completing a questionnaire with a pre-specified list of potential individuals, resulted in some nodes being named as groups as opposed to individuals. Nevertheless, employing ego network analysis within this study allowed for a deeper insight into perceptions

of school wellbeing structures. Embedding this within semi-structured interviews also encouraged discussion of how relationships affect implementation of health improvement within schools and engagement with a collaborative research network.

This thesis did not aim to evaluate the effectiveness of SHRN. However, through mixing methods, survey methodology facilitated capture of engagement with this new, existing infrastructure for school health and allowed for context to be mapped and for case study findings to be interpreted within this contextual frame. It has been noted that good social science employs a mix of qualitative and quantitative methods to effectively answer the research question (Flyvbjerg, 2006). Future studies with more resource should aim to analyse survey data prior to commencing data collection for case studies. This would allow findings from the survey to inform design of the interview schedules and follow up findings of interest. Despite this, within the current thesis, development of both the survey questions and the interview schedules were informed by the same theoretical frameworks, allowing data captured within case study interviews to elaborate on many of these findings. Moreover, if more time was available to conduct this study, the use of survey results to recruit case studies with maximum variation in engagement with SHRN feedback. This may enhance learning with regards to how different contexts may facilitate or hinder engagement with health and wellbeing-related feedback and the prominence of health and wellbeing in school systems (Stake, 1995).

Qualitative data relating to SHRN was not as rich as anticipated. This may be due to social desirability or the fact that school engagement with SHRN at the point of data collection was far more limited than anticipated. The researcher tried to minimise the potential for social desirability within the interviews through highlighting that, whilst obviously working alongside the SHRN team, their work had a degree of separation from the project. However, the richness of data may have been further improved through utilising an example feedback report as a visual aid within the interviews. The use of visual aids has previously been shown to enhance the depth of qualitative interviews (Harper, 2002; Hogan et al., 2007). A further example of this was the use of ego network analysis within the Wellbeing Lead interviews via a pen and pencil method. Participants were enthusiastic about this process and the visual

representation of their ego network, created by the Wellbeing Leads, seemed to act as a prompt to elicit in depth information about their relationships and communications with other staff, students, parents and outside agencies regarding health and wellbeing.

Sampling of staff, students and parents was undertaken through a pragmatic process with reliance on the Wellbeing Lead or, in the case of recruitment of parents and students in Oakwood School, the School Nurse. Therefore, although the researcher stipulated the need for a representative sample, this may have resulted in staff selecting those individuals who would show their school in a positive light. However, a broad range of both positive and negative opinions were expressed, suggesting that this was not the case.

In the case of parental interviews, due to difficulty with recruitment, parent participants from Greenfield, Woodlands and Highbridge Schools were also members of staff at the school. Thus, these participants are likely to have had more of an insight into school functioning and may not have faced the same barriers to communications as other parents. However, many of these provided their opinions of how parents in general perceived communication with the school. Therefore, their interviews are likely to have provided a valid insight into parental perceptions. Moreover, the fact that these three schools were unable to recruit parents who did not work in the school is an important finding in itself, suggesting the need for further research into how to engage and collaborate with this group and actively involve them in decision making (Velsor & Orozco, 2007).

This thesis focuses mainly upon wellbeing structure within the school, whilst previous studies, such as Gatehouse (Bond et al., 2004) and CORE (Hawe et al., 2015a) have aimed to change the school ethos in order to increase school connectedness and, subsequently, health risk behaviours. It may be that a focus on wellbeing may not be the most important element for improving student health. Indeed, Markham and Aveyard (2003) theorise that through breaking down boundaries between teachers and students, there will be an increase in 'committed' students who will have greater capacities for affiliation and practical reasoning. This

may indirectly result in improved health behaviours and outcomes. While this thesis did investigate functioning of the school system more generally in terms of topics such as student voice and parental involvement, perhaps a larger focus on general as opposed to health and wellbeing-related staffing structure and interactions may have been insightful.

8.9 Implications for research, policy and practice

8.9.1 Implications for the future development of SHRN

The results from this thesis highlighted that it is likely further infrastructure is required to reduce barriers and enact agency using data from the SHRN feedback reports. This could help to reorient complex school systems toward health and wellbeing through increasing the diversity of agents, improving information flow between systems, increasing informal rules regarding health and wellbeing, improving schools' capacity to respond to change and providing feedback loops in the form of monitoring and feeding back changes to student health and wellbeing and the school environment over time (Keshavarz et al., 2010). Moreover, the level or intensity of support required for each school to utilise the SHRN feedback is likely to vary according to pre-existing system functioning, health-related structures and networks. Therefore, this highlights the importance of understanding variance in system starting points to facilitate the development of contextually tailored approaches to maximising engagement with SHRN and the utilisation of SHRN feedback.

It would also be important to reduce cost and ensure sustainability and scalability of support from facilitators external to the school system. This could be achieved through investigating whether, through greater partnership working, existing infrastructure for overseeing health at levels beyond individual schools, such as local authorities can be harnessed to support this contextually tailored data-led needs assessment and evidence informed action planning. This, again, highlights the need to understand pre-existing variance in system functioning in terms of engagement with outside agencies in order to either harness existing structures or support schools in developing new partnerships where required. Such a support structure may help to systematise health improvement, facilitating the prioritisation of information which

is relevant to each complex school system's requirements (Hawe et al., 2009b; Keshavarz et al., 2010).

8.9.2 Implications for the development of new interventions

SHRN aims to enable schools to monitor their students' health behaviour data over time and deduce where more attention is needed, thus reducing over reliance on teacher perceptions. The extra infrastructure proposed for the future development of SHRN in Section 8.9.1 could facilitate the exploitation of this health feedback data to plan health improvement activity and interventions in schools. Moreover, this thesis attempted to operationalise CAS thinking, investigating initial conditions as a preliminary step to inform any future intervention development for school health and wellbeing. If public health research is to progress, researchers need to focus upon theorising the process by which each intervention is intended to interact with complex school systems, what practices they aim to displace and methods of capturing this. This should be undertaken prior to intervening and could help to decide whether and how to intervene to harness existing social networks and work with the system to achieve change. Moreover, this could help to identify schools whose networks are not highly conducive to adopting new health improvement actions in order to disproportionately direct resources to supporting change in these schools. Doing so would likely result in improving the quality and relevance of interventions.

Ego network analysis represents a viable method for capturing this between school variability in characteristics of schools' health-related networks, which may predict the success of subsequent efforts to deliver school health improvement. Efforts to support schools in their reorientation towards health improvement could use ego-network analysis methods to identify influential figures and features of schools' health-related networks which may impede or support the flow of information through the system. This could facilitate attainment of the greatest degree of leverage over the system. In addition, ego-network analysis may be useful in identifying gaps in health-related networks within schools, such as the absence of involvement of key senior staff, from whom achieving greater buy-in may be necessary to achieve substantial system changes. Thus, future research should measure the core network

constructs observed within this study in a larger number of schools, to allow quantitative testing of system starting points and effects on delivery of school health improvement. This could be used to inform intervention development.

Interventions should employ a whole school approach, targeting education, ethos and family engagement. In light of the results of this thesis, involvement of each department in health and wellbeing alongside interaction and collaboration across departments should be recommended to ensure health is mapped across the curriculum in a strategic and effective manner. This could help to improve the flow of resources between nested subsystems and diverse agents within school systems (Keshavarz et al., 2010).

Qualitative results across Chapters 6 and 7 showed that ethos could be targeted through promoting positive relationships between staff, students and parents and by ensuring that all stakeholders are listened to, but that expectations of their impact are managed. Moreover, this could be further targeted through establishing known points of contact for students' wellbeing issues, training staff to value wellbeing and securing SMT support for wellbeing. These changes could help to orient both formal and informal school rules towards health and wellbeing (Keshavarz et al., 2010). The qualitative results of this thesis, reported in Chapter 7, further highlighted ways in which the engagement of families could be targeted including; improving communication to align health messages between school and families, incorporating the health of the family as well as the student, harnessing role reversal for students to take home healthy messages to families, establishing clear points of contact for families, targeting disengaged parents in an active manner and engaging non-teaching staff and outside agencies to help promote parental engagement. This could help to enhance the flow of resources between these two groups of stakeholders (Keshavarz et al., 2010).

8.9.3 Implications for the evaluation of interventions

Adopting a CAS perspective to the evaluation of interventions to improve school health and wellbeing may better enable evaluation to capture the whole intervention process including variance in baseline system functioning, how and to what extent

current structures are replaced and the subsequent changes in system functioning and health outcomes. Ego network analysis, alongside qualitative interviews, represent viable methods for understanding the extent to which network structures facilitate or impede efforts to change system functioning and how networks evolve in response to an intervention. This could be undertaken through a longitudinal evaluation and combined with SHRN feedback report data, which are provided to schools every two years, to monitor changes in student health outcomes and the school environment. Furthermore, these data could be utilised within natural experiments of new health improvement actions within schools to identify "indigenous solutions" emerging from within school systems, instead of being imposed from outside (Hawe, 2015).

8.9.4 Implications for broader education supra-systems

Within this thesis the perception of tension between education as the core aim of schools and health and wellbeing was seen to be a barrier to the prioritisation of health and wellbeing in schools, which was perpetuated by rules enforced by supra-systems. This demonstrates that action is required to promote the synergy between these two agendas, and perhaps even the targeting of both health and education within single interventions. This suggests that political and educational supra-systems driving assessment agendas in schools may need to be reoriented towards health and wellbeing to serve as positive feedback loops, whereby schools are rewarded for prioritising these areas alongside and synergistically with academic outcomes.

8.10 Conclusions

Overall, this thesis has obtained a higher level of understanding of how social networks of school staff and complex school system dynamics within the confines of the school gates, and their interactions with other systems, may impede or facilitate efforts to respond to student health needs within their school. Results demonstrated a need for further infrastructure, such as support from outside agencies and the systematisation of wellbeing roles, to support schools in implementing actions from the results of the SHRN health reports. Furthermore, allocation of responsibility for wellbeing to a member of the SMT alongside a distributed leadership approach may also be important factors in the reorientation of school systems towards health and

wellbeing. Past application of CAS thinking to public health intervention research has often been tokenistic and focused either on quantitative or qualitative methodology. This thesis has made an important contribution to this field through employing mixed methodology, the use of SHRN as a case study to provide understanding of the Welsh school context and layering theory to facilitate the practical application of CAS thinking. Conceptualising schools as CASs, which respond in diverse ways to the same external stimuli, draws focus to the likelihood that attempting to provide interventions without first engaging with school systems to understand their existing dynamics and how these impede or facilitate health improvement, is likely to give rise to highly variable emergent outcomes. The use of ego-network analysis to understand variance in complex school system starting points could be replicated on a larger scale and utilised to design complex interventions, which work with the system to achieve change.

9 Appendices

9.1 Appendix A: Definition of acronyms

CAS – Complex Adaptive System

DOI – Diffusion of Innovations

HPS – Health Promoting School

IT – Implementation Theory

NPT – Normalisation Process Theory

PE – Physical Education

PSE – Personal and Social Education

SHRN – School Health Research Network

SMT – Senior Management Team

TPB – Theory of Planned Behaviour

WHO – World Health Organization

9.2 Appendix B: Literature search

The literature search was conducted in an iterative manner, whereby the research informed the research and the research informed the development of the literature review. This review was not systematic, but did aim to provide a critical reflection on and identify gaps and limitations within the school health literature, as well as the relevant theoretical frameworks.

A range of databases were searched for relevant research. These included: PubMed, OVID (psychINFO), Web of Science, Cochrane Library, Cardiff University Library and Google Scholar. The broad search terms initially applied in relation to Chapter 2 'Understanding school context and implementation' consisted of varying combinations of 'health', 'wellbeing', 'school', 'health promoting school', 'effect', 'adolescence', 'health improvement', 'education', 'link', 'systematic review', 'implementation', 'theory' and 'social network'.

Meanwhile, as Chapter 3 'Features of complex adaptive systems and their application to the school setting' focused in-depth on the complex adaptive systems framework, search terms were expanded to include terms such as, 'complex', 'systems', 'thinking', 'student voice', parental involvement', 'ethos', 'critical realism', 'social network' and 'case study'.

Literature was also acquired in other ways, such as through recommendations made by research supervisors and colleagues. Moreover snowball sampling was applied with relevant and key articles, such as Keshavarz' (2010) article on the conceptualisation of schools as complex adaptive systems, articles relating to the Gatehouse Project and the Inclusive Study. This was also undertaken in relation to prominent authors in the field, such as Penny Hawe and Chris Bonell.

9.3 Appendix C: Survey questions

Utility and credibility of the health report

1 What is your role in the school?

2 Does health feature in your everyday job role?

The following questions will ask you about the Health Report that your school received in July 2014 due to your school being a member of the School Health Research Network.

The Health Report is a tailored report of student health and wellbeing in 2013-2014. The report is based on the students' responses to the Health Behaviour in school-aged Children (HBSC) survey. The survey asked students about a range of health behaviours and outcomes as well as their age, gender and how they feel about school.
The report uses the survey to report on the following health topics:
· Food, fitness and physical activity
· Mental health and emotional wellbeing
· Smoking and alcohol use

4 Have you received your School Health Research Network Health Report?

5 Do you think the Health Report might be useful in helping you to plan actions to improve health in your school?

6 Have you read the Health Report?

Discussion of the health report

7 Have you distributed the Health Report to any of your colleagues?

IF YOU ANSWERED SOME, LOTS OR ALL OR MOST OF MY COLLEAGUES, PLEASE SKIP TO QUESTION 8

a If not, do you plan to distribute the Health Report to any of your colleagues?

b If not, why not?

8 Have you discussed the Health Report with colleagues within your school?

IF YOU ANSWERED SOME, LOTS OR ALL OR MOST OF MY COLLEAGUES, PLEASE SKIP TO QUESTION 9

*a*If not, do you plan to discuss the Health Report with colleagues within your school?

*b*If not, why not?

9Have you discussed the Health Report with students in your school?

*b*If not, why not?

IF YOU ANSWERED SOME, LOTS OR ALL OR MOST OF THE STUDENTS, PLEASE SKIP TO QUESTION 10

*a*If not, do you plan to discuss the Health Report with students in your school?

*b*If not, why not?

10Have you discussed the Health Report with any other schools?

IF YOU ANSWERED SOME, LOTS OR ALL OR MOST OF THE SCHOOLS IN THIS AREA, PLEASE SKIP TO QUESTION 11

*a*If not, do you plan to discuss the Health Report with any other schools?

*b*If not, why not?

11Have you discussed the Health Report with any outside organisations?

*a*If yes, what type of organisations?

IF YOU ANSWERED 1 or 2, SOME OR LOTS OF ORGANISATIONS, PLEASE SKIP TO QUESTION 12

*b*If no, do you plan to discuss the Health Report with any outside organisations?

*c*If not, why not?

12Have you discussed the Health Report with school governors?

IF YOU ANSWERED YES, PLEASE SKIP TO QUESTION 13

*a*Do you plan to discuss the Health Report with school governors?

*b*If not, why not?

13Have you discussed the Health Report with any parents?

IF YOU ANSWERED ALL OR MOST, LOTS OR SOME PARENTS, PLEASE SKIP TO QUESTION 14

*a*Do you plan to discuss the Health Report with any parents?

*b*If not, why not?

14Some of the other users of the Health Reports are listed below. Have you sought advice from any of these?

*a*If you selected Other, please specify:

15Have you had any new ideas about health promotion practice in your school due to the Health Report?

Use of the Health Report results

16Are you likely to need any more support to be able to make use of the Health Report in schools?

*a*If 'likely' or 'very likely', please specify the type of support likely to be required?

17What is the likelihood that your school will suffer negative consequences as a result of receiving the Health Report?

*a*If 'likely' or 'very likely', please specify type of negative outcomes

18Which member/s of staff is/are mainly responsible for interpreting the Health Reports?

*a*If you selected Other, please specify:

19Which of the following do you consider would prevent you from utilising the Health Report to its full potential to enhance health improvement within your school?

*a*If you selected Other, please specify:

20Which of the following do you consider would be of help in utilising the Health Report to enhance health improvement within your school?

*a*If you selected Other, please specify:

9.4 Appendix D: Staff interview schedule

School ethos

- Main core values held by schools in Wales
    - variance between schools in the network?
    - Staff expectations of students
    - Student expectations of teachers

- Major strengths of school in terms of health and education
- Attitudes towards health and education
- School policies regarding health and education

Awareness of health improvement activities

- *Researcher to define health improvement activities*
- *Researcher to give a brief introduction of the School Health Research Network*
- Awareness of activities in the school
- Student involvement in these activities
- Enforcement by policies
- Activities by socioeconomic status

Importance of school for promoting health

- Importance of health as an issue to promote to students
- Role of school in promoting student health

Importance of family for promoting health

- Role of family in promoting student health

Collaboration between staff, students and parents

- Quality of relationships between staff, students and parents
- Consultation of parents and students about health
- Staff communication in terms of health?
- Collaboration between school and families?
- Collaboration and sharing resources with other schools.
- Community feel of the school and collaboration
- Collaboration with governors

Link between health and education

- Link between health and educational attainment
- Relationship between health and education
- Tackling academic achievement and health simultaneously
- Link between health improvement and ESTYN?

Health structures in the school

- Health improvement lead in the school
    - Perceptions of positives and negatives of this lead
    - Presence of team support structure
    - Effect of school size
    - Effect of length of service of lead
    - Effect of seniority of lead
    - Accessibility and commitment of senior management in terms of health
- Importance of both PSE and general wellbeing structures for school health improvement
- Value teachers in the school place on health
- Support for health throughout the whole school

Student voice

- Extent to which students feel that they have a say in school health promotion
- Extent to which other students at the same school feel the same
- School council use and involvement in health improvement
- Implementation of ideas from school council
- Inclusion of disengaged or minority students?

Barriers and facilitators to student involvement

- Main barriers to being involved in health improvement
- Main facilitators to students involvement
- Ways to increase student participation

SHRN health reports

- *Researchers to describe the School Health Research Network*
- Receipt of report
- Role of SHRN in school health
- Utility of report and how it may affect communications about health improvement within the school
- How report will be used

- Members of staff responsible for reading and using the report
- Barriers and facilitators to using health report

Healthy Schools

- Role do Healthy Schools play in their school/network
- Role of Health Schools in motivating staff to prioritise health
- Potential role of Healthy Schools in providing a structure for supporting the interpretation and use of the Health Report
- Potential role of researchers in providing a structure for supporting the interpretation and use of the Health Report

9.5 Appendix E: Student interview schedule

School ethos

- Core values of school
- Attitudes of staff/students/families towards health and education
- Staff expectations of students and vice versa?
- Strengths of the school in terms of health and education
- Rules about health in school

Importance of school for promoting health

- Importance of health as an issue to promote to students
- Role of school in promoting health of students
- Point of contact for any problems or concerns about health and wellbeing
- School staff whose role involves looking after students' health and wellbeing

Importance of family for promoting health

- Family's role in promoting health of students

Collaboration between school and family

- Quality of relationships between staff, students and family
- Consultation of families and students about health
- Schools current level of working together
- Importance of schools working together with families

Link between health and education

- Perceived link between health and educational attainment

Awareness of health improvement activities

- *Researcher to define health improvement activities*
- Awareness of activities in the school
- Student involvement in these activities

Do students feel that they have a voice?

- Extent to which students feel that they have a say in school health promotion
- Extent to which other students at the same school feel the same
- School council use and involvement in health improvement

Barriers and facilitators to student involvement

- Main barriers to being involved in health improvement
- Main things that help students to be involved
- Ways to increase student participation

SHRN health reports

- *Researcher to describe SHRN*
- Initial thoughts and perceptions of SHRN
- Utility of SHRN to help improve the health of students
- Utility of health reports for increasing student engagement
    - E.g. use in school classes
        - Student interest in results?

9.7 Appendix F: Parent interview schedule

School ethos

- Core values of school
- Attitudes towards health and education
- Teacher student relationships

Importance of school for promoting health

- School's role in promoting health of students
- Importance of health as an issue to promote to students

Importance of family for promoting health

- Family's role in promoting health of students

Collaboration between school and family

- Quality of relationships between staff, students and parents
- School consultation of parents and students about health
- School collaboration with families

Link between health and education

- Perceived link between health and educational attainment

Awareness of health improvement activities

- *Researcher to define health improvement activities*
- Awareness of activities in the school
- Student involvement in these activities

Do parents feel like they have a voice?

- Perception of having a say in school health promotion
- Perception of other parents' thoughts about having a say in health promotion

Barriers and facilitators to parental involvement

- Main barriers to being involved in health improvement
- Main things that help parents to be involved
- Ways to increase parent participation

Barriers and facilitators to student involvement

- Main barriers to being involved in health improvement
- Main things that help students to be involved
- Ways to increase student participation

SHRN health reports

- Initial thoughts and perceptions of SHRN
- Utility of SHRN to help improve the health of students
- Utility of health reports for increasing student engagement
    - E.g. use in school classes
        - Student interest in results?
- Utility of health reports for increasing parental engagement

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