Transition from primary to secondary school and young people's mental health

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Summary

The transition from primary to secondary school is an important life event for young people that has the potential to impact their mental health. Yet there is insufficient evidence of the factors associated with mental health across this period, or how interventions might improve transition experiences. This thesis uses ecosocial theory to conceptualise school transition as an exposure that interacts with the social, historical, ecological and political environment in which a child lives, leading to embodiment of mental health over the life course. It uses quantitative methods (latent class growth analysis and multi-level modelling), as well as effect direction plots within a systematic review, to better understand how different individual and environmental factors influence young people's mental health over this period.

The quantitative analyses demonstrate that young people from poorer backgrounds, those with special educational needs and those who have experienced negative life events, tend to have worse mental health in the first year of secondary school. At an ecological level, school culture, in particular high school meaningfulness is associated with increased mental wellbeing in year 7 students. Social and psychological outcomes appear to be more easily modified than behavioural outcomes using transition interventions, and too few interventions are premised on a clear theory of change, or consider how they might be exacerbating mental health inequality. The thesis concludes that school transition may evoke pathways to embodied injustice that hold across different contexts, although further analyses are needed to understand these contexts and the mechanisms of action involved. There is also a need to situate transition more fully within a life course approach by incorporating mental health data from earlier in primary school rather than solely the later stages. Finally, evidence is needed on how schools can create cultures that are meaningful for all children, irrespective of background.

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1. Introduction

This thesis will consider factors associated with young people's mental health as they transition between educational settings, from the theoretical perspective of ecosocial theory (Krieger 2011; Krieger 2021). It will draw on the concepts of embodiment and pathways to embodiment, and argue that transition should be viewed as an exposure that individuals have different resistance and susceptibility to, with mental health creation situated within time, levels and history. School transition is not problematic for all children, and many look forward to the opportunities it brings (Moore et al. 2021). However, there is a significant minority of children - potentially one in three (Waters et al. 2014) - for whom transition poses a threat to their wellbeing. If transition is a stressful and difficult process, it may result in some young people being unable to settle into their new secondary school, build new relationships and experience school connectedness, which is vital for future educational attainment, as well as future mental health (Pate et al. 2017; Frostick et al. 2018; Cadman et al. 2021).

Many mental illnesses are first diagnosed in adolescence, and poor mental health in adolescence is predictive of poor mental health in adulthood (Copeland et al. 2009; McLeod et al. 2016). Environmental factors interact with biological factors to create embodiment of a mental health phenotype, and school transition, which occurs during puberty when important brain maturation is occurring (Blakemore et al. 2010), is an important environmental exposure with potential future impacts on mental health functioning. This thesis therefore adds an important voice to the argument that school transition should be considered an important educational and health policy area. In England there is currently no requirement for schools to develop transition plans for students moving from primary to secondary school (Department for Education 2022b) while in Wales, new legislation (Senedd Cymru 2022) specifically requires primary and secondary schools to develop transition plans that consider young people's wellbeing. However, as will be argued in this thesis, the extent to which transition plans and other short-term, targeted measures can support young people's mental health is largely likely to be remain

dependent on the wider school environment and culture from which, and into which, children transition.

Mental health is a complex construct that has been defined and measured in different ways. The WHO definition, that good mental health is not just the absence of disease but is a state that "enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community" (World Health Organization 2022b) highlights that while much focus is often put on mental illness, good mental health involves positive attributes that bring 'eudaimonia', or 'flourishing' (Phillips 2006). Being able to lead a flourishing life and avoid mental illness requires resources that can be mobilised in times of difficulty or stress. This thesis will focus on two key types of resources, psychosocial and flexible. Psychosocial resources, which have also been described as 'coping resources' (Crielaard et al. 2021) include self-esteem, mastery and social support (Taylor and Broffman 2011), and flexible resources, which include money, power and cultural capital (Bourdieu 1977; Phelan et al. 2010), will be argued to be key to understanding young people's ability to weather the potential storm of school transition.

A number of individual-level characteristics will be considered as predictors of young people's transition experiences, including gender, socioeconomic status (SES), having special educational needs (SEN), experiencing negative life events (NLEs) and being worried about transition. The differences in how each of these individual-level constructs were used in this thesis will be discussed further in chapter ten. It will be argued that the resources possessed by an individual are directly related to characteristics associated with a more negative mental health transition, in particular low socioeconomic status (SES) and having special educational needs (SEN) (Jindal-Snape et al. 2020). Alongside this, school environment, which it will be argued has the potential to determine how stressful the transition is, and the resources needed by each child, will be explored as a means of understanding the factors associated with mental health outcomes.

Three main empirical analyses will be presented adopting critical realism (CR) as a research paradigm (chapter five). CR views the social world as ontologically real, but epistemologically relative (Gorski 2013; Bhaskar 2017). The first two

main analyses (chapters six and eight) will be based on two secondary, longitudinal quantitative datasets. The first was collected as part of the School Transition and Adjustment Research Study (STARS) which took place in 2012-13 (Rice et al. 2014) in South East England, and the second, a linked dataset based on two Welsh schools' surveys: 'CHETS' (Changes in child exposure to environmental tobacco smoke), which took place in year 6 in Welsh schools and the School Health Research Network (SHRN) survey that followed the same students into year 7. Both of these surveys were completed in 2019. The research questions and the mental health outcomes were guided (and limited) by the data available, however, both datasets provide a rich source of information about young people's transition experiences.

In the first dataset (chapter six), the focus will be on measures of mental health difficulties, and how the different subscales representing conduct problems, emotional difficulties, peer problems and hyperactivity, change in parallel with one another over the transition period for different subpopulations of young people, using a latent class growth analysis (LCGA). This analysis, focusing on mental health trajectories and change over time, has not previously been carried out looking specifically at the primary to secondary transition period, or with these particular measures. Two research questions will be addressed in this analysis:

- RQ1: Among young people experiencing a primary to secondary school transition, are there subpopulations that can be identified based on their trajectories of mental health difficulties?

- RQ2: Do individual-level socioeconomic status, special educational needs, worrying about transition, experiencing multiple negative life events prior to transition and gender predict which trajectory class young people will be situated within?

The chapter will present findings that there are four subpopulations of young people identifiable by their mental health trajectories. While just over half of students (54%) were in a low and stable trajectory class, the remaining students were divided between three more concerning subpopulations, each experiencing their own combination of mental health difficulties. Membership of these

subpopulations was predicted by different individual-level characteristics as hypothesised.

Analyses of the second dataset (chapter eight) will pose two additional research questions:

- RQ3: To what extent are socioeconomic status, gender, being worried about transition and pre-transition mental health important individual-level predictors of mental health and mental wellbeing following transition to secondary school?

- RQ4: After taking individual-level predictors into account, to what extent are school-level meaningfulness, classification and affluence important school-level predictors of mental health and mental wellbeing following transition to secondary school?

The same measure of mental health difficulties will be used as a dependent variable, however with a focus on a total difficulties score and just two of the subscales (conduct problems and emotional difficulties). It will also use an additional mental health measure, focusing on mental wellbeing. Using multi-level analyses, with four school-level variables, this analysis will seek to better understand how these different measures of mental health might differ in their associations with a range of variables across the primary to secondary school transition. The school-level variables include administrative data on percentage of children eligible for free school meals, alongside three additional variables developed within this thesis - school meaningfulness, child perspectives of school classification and teacher perspectives of school classification (chapter seven). These three variables represent aspects of the school culture that are theorised to help explain whether young people are able to build the agency needed for their mental health to be supported in a new school environment (Bernstein 1975; Markham and Aveyard 2003; Markham 2015). The findings will include assessing whether a number of individual-level variables, including SES, gender and being worried about transition, are differentially associated with each mental health outcome. At the school level, evidence will be presented that mental wellbeing in particular may be associated with school meaningfulness, and that school

affluence may potentially mask the negative effects of individual-level SES, with poorer students having better mental health in poorer schools than in more affluent ones.

There is often seen to be a gap between research and practice that inhibits research evidence informing policy decisions (Shelton et al. 2020), and policies to improve population health often fail (Alderson 2021). An important part of the translation process from research to practice is therefore acknowledging the open systems in which health is created, and the importance of understanding context and how context may influence mechanisms. The systematic review presented in chapter nine therefore seeks to better understand how interventions used in a diverse range of contexts and with diverse populations of young people may be similar and dissimilar in their mechanisms and focus. It will go beyond the primary to secondary school transition to also consider the effectiveness of interventions at the pre-school to school, and school to post-compulsory education transition, as well as how these three types of transition might differ in their intervention characteristics. It will consider social as well as behavioural and psychological measures of mental health, and is the first systematic review to evaluate effectiveness of school transition interventions. The two overarching research questions posed are:

- RQ5: What are the characteristics of effective school transition interventions?

- RQ6: What are the theories of change that mental health transition interventions draw upon?

Findings from the systematic review suggest that universal school transition interventions tend to be more effective for psychological and social outcomes compared to behavioural outcomes, that there is a key role for both schools and parents, particularly at the earlier transitions, and that there is insufficient explicit consideration of the theories of change upon which interventions are based. There is also insufficient analysis into the potential of transition interventions to widen mental health inequalities for young people from poorer families.

The layout of this thesis will be as follows. Chapter two will present ecosocial theory and its relationship to mental health inequality. Chapter three will review the theoretical literature on school environment and health, before considering evidence of the impact of school transition on mental health outcomes. Chapter four will present the research questions and place them within the context of the gaps identified within the literature review chapters, while chapter five will present the methodology for this thesis. Chapter six will present the first empirical analysis based on the STARS data, using a LCGA to model four parallel trajectories of mental health and to assess where there are subpopulations of young people within these parallel trajectories. Chapter seven will describe the development of three school-level measures. These measures will then be used, alongside the CHETS-SHRN data in chapter eight in a multi-level analysis to better understand the factors associated with mental health across the primary to secondary transition. Chapter nine will present the final empirical chapter which contains the systematic review of transition interventions and uses effect direction plots to visualise intervention effectiveness. Finally, chapter ten will discuss the findings of all empirical chapters, separately and then in relation to each other, before considering the strengths and limitations of this research, and suggesting directions for future investigation into school transition.

2. The embodiment of mental health

The production of mental health is an on-going process that occurs across an individual's life course as the surrounding environment interacts with biology. This chapter will provide an overview of the concept of mental health and explore arguments about the relationship between mental illness and mental wellbeing. It will then situate this research within the context of ecosocial theory and consider the role of psychosocial resources, such as self-esteem and social support, as well as flexible resources including money and cultural capital as mediators of mental health embodiment. It will argue that socioeconomic status is a central pathway to embodiment by drawing on work by Link and Phelan on fundamental causes of inequality (Phelan et al. 2010).

Many terms are used to describe mental functioning and they are not always used consistently. Part of this difficulty is in the lack of consensus over how mental health is measured or in the validity of clinical diagnoses, as will be discussed further below. In this thesis, 'mental health' will be used to refer to the full spectrum of positive and negative aspects of mental functioning. 'Mental illness' or 'mental disorder' will be used to refer to the negative aspects of overall mental health. Depending on context, this may refer to a clinical threshold for diagnosis being reached (i.e. a binary construct) or low scores on a continuous measure without a clinical diagnosis. The terms 'mental health problems' and 'mental health difficulties' will also be used in the context of a continuous measure of mental health that suggests poor functioning. 'Mental wellbeing' will be used to refer to the positive aspects of overall mental health. These differences will be explored further in the sections below.

2.1 Mental illness: definition and measurement

Mental illness encompasses a range of conditions including anxiety disorders, depression, schizophrenia and conduct disorders, affecting thoughts, perceptions, emotions, relationships and behaviours (World Health Organization 2022a). Mental illnesses can range from mild to severe, although there is lack of consensus about how to define or assess severity (Zimmerman et al. 2018). In the UK today, approximately 1 in 4 people will experience a mental illness in any

given year, and in England, 1 in 6 people will be experiencing a mental illness in any given week (MIND 2017). Although these figures may vary depending on where cut off points for clinical diagnosis are set, typically, to be considered to have a mental illness, symptoms have to be affecting daily functioning (World Health Organization 2022a). In 2010, mental illness and substance use disorders accounted for 183.9 million disability-adjusted life years (DALYs) globally and were the leading cause of years lived with disability (YLD) (Whiteford et al. 2013). The average age of onset of mental disorder varies, but it is more likely to begin in childhood or adolescence (Kessler et al. 2007). It is estimated that 50% of mental disorders occur by age 14 and 75% by age 24 (Kessler et al. 2005). There is high comorbidity among mental illnesses, so many children and adolescents who develop a mental illness will go on to develop other mental illnesses as they age (Krueger et al. 2003). This may be due to mental disorders sharing common risk (Plana-Ripoll et al. 2019) and genetic factors (Huang et al. 2010). As symptoms for different mental illnesses frequently overlap, it has been argued that the current categorical, discrete groupings of mental illnesses should be reviewed and that a quantitative, hierarchical taxonomy should be used instead to provide a more integrated conceptualisation of mental illness (Kotov et al. 2017).

Mental health follows a trajectory through childhood and into adulthood for each individual, with normative trends suggesting higher rates of depression in younger and older adults than in middle age (Clarke et al. 2011). In adolescence, rates of depression are broadly stable while anxiety tends to decrease, although young people with high levels of depressive symptoms are likely to experience less decline in anxiety than those without depressive symptoms (McLaughlin and King 2015). Trajectories may be mediated by ethnicity, family background, neighbourhood context, education and income levels (Clarke and Wheaton 2005; Walsemann et al. 2009; Quesnel-Vallee and Taylor 2012). There is also a moderate to strong genetic component in mental illnesses, with evidence of genetic heritability of depression (Sullivan et al. 2000; Kendler et al. 2006), anxiety disorders (Eley 2007; Norrholm and Ressler 2009), conduct disorder (Salvatore and Dick 2018) and schizophrenia (Henriksen et al. 2017). There is evidence that several single-nucleotide polymorphisms (SNPs) are associated with overlapping mental disorder phenotypes, highlighting shared genetic components in different disorders (Cross-Disorder Group of the Psychiatric

Genomics Consortium 2013; Taquet et al. 2021). The relative importance of genetic and environmental factors to mental illness aetiology is often debated, however it is clear that both are important and that they interact with each other to create a mental illness phenotype (Wermter et al. 2010).

While evidence of the burden of mental illness for individuals and society is unequivocal, mental illness statistics are not without contention. Young people may lack the health literacy and self-awareness to understand that they are mentally unwell and need to seek help (Coles et al. 2016), and there is evidence that some GPs are reluctant to discuss mental health openly with young people (Martinez et al. 2006). This can result in failure to diagnose. Mental health stigma may also prevent people accessing care, and over time as shifts in stigma, recognition of illness and accessibility of mental health support occur in primary care, diagnosis rates will be altered, independently of any changes in actual population rates of illness. There has also been criticism of how mental illness is defined, with concerns that increasing numbers of mental disorder categories are being created, resulting in social problems being labelled as mental illness (Frances 2012). There has also been concern that there is a lack of reliability for diagnoses between clinicians and using categorical rather than continuous assessment means that the relatively arbitrary thresholds for diagnosis leave many people experiencing distress below set thresholds (Kotov et al. 2017). Yet, binary classifications, despite their limitations, do serve a purpose when prescribing medication, where the thresholds serve to try to balance out the trade off between side effects and severity of illness. Diagnosis can also be affected by inequalities in class, gender and ethnicity (White 2018) and should therefore be considered a sociological phenomenon in its own right (Nettleton 2013).

This research will use continuous measures of mental health, rather than categorical groupings, and therefore will not attempt to diagnose participants. However, even continuous measures have epistemological limitations, as will be further discussed in chapter five.

2.2 Mental wellbeing: definition and relationship to mental illness

While mental illness is an important and often focal outcome for public health research, mental health is more than just the absence of disease or infirmity (WHO, 2020). For an individual to have good mental health, or 'mental wellbeing' they need to experience a range of positive elements. Keyes et al. (2012) cites 13 dimensions of mental wellbeing that may capture elements of this 'something positive': positive affect; avowed personal quality of life; self-acceptance; social-acceptance; personal growth; social actualization; purpose in life; social contribution; environmental mastery; social coherence; autonomy; positive relations with others; and social integration. These dimensions cover both hedonic and eudaimonic theories of mental wellbeing. On a similar theme, Ryff's (2013) conceptualisation of psychological wellbeing includes six core dimensions: self-acceptance, purpose in life, autonomy, environmental mastery, personal growth and positive relationships.

Recent UK evidence suggests decreases in mental wellbeing from 10-12 years to 13-15. While 84.9% of 10-15 year olds were relatively happy with their lives, 10-12 year olds were significantly more happy than 13-15 year olds (Department of Education 2019). Welsh data from the Health Behaviour in School Aged Children Survey (HBSC) suggest that mental wellbeing worsens from secondary school year 7 to year 11, particularly for girls (Hewitt et al. 2019). This decrease with age is echoed by US studies (Keyes 2006).

There is some contention around the relationship between mental wellbeing and mental illness, with some arguing that they are overlapping but distinct concepts - the 'two continua' model (Westerhof and Keyes 2010) - and others suggesting that they are opposite ends of the same scale. Huppert (2014) for example has stated that: "It is difficult to conceive how someone with a current diagnosis of major depressive disorder could be regarded as flourishing at the same time" (p.7). However, a recent systematic review of papers that tested the two continua model (Iasiello et al. 2020), found that of the 83 papers included, all but one found evidence for it (van Erp Taalman Kip and Hutschemaekers 2018). The sole paper that found no evidence included individuals with severe and extremely severe mental illness, rather than general population or individuals with mild to moderate

mental illness as in the other papers. It has been shown in other studies that in cases of severe mental illness, there is a high correlation between mental wellbeing and mental illness indicators (Bartels et al. 2013; Lukat et al. 2016; Haeyen et al. 2018).

Iasiello et al (2020) highlight that some of the difficulties in fully understanding the relationship between the two constructs is due to measurement. Different scales have different conceptualisations of the constructs and may not include questions that enable the whole construct to be measured. Some scales, such as the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) view mental health as a continua with mental wellbeing at one end and mental illness at the other (Warwick Medical School, 2019) and there is clear overlap between the questions in WEMWBS and the GHQ-12 which measures mental distress (Peasgood et al. 2014). It has been argued that they may be measuring the same construct, albeit with the former as a positively worded version of the latter (Melendez-Torres et al. 2019). Yet, even in the case of WEMWBS, while the bottom end of the mental wellbeing scale shares social and economic predictors with mental illness, the top end of the scale, representing high mental wellbeing has different predictors and therefore appears to be measuring something different to mental illness (Stewart-Brown et al. 2015).

The two continua model of mental illness and mental wellbeing is supported by genetic as well as epidemiological evidence. About 50% of genetic influences on mental wellbeing are the same as those that have an impact on internalising mental disorders, but 50% is unrelated (Kendler et al. 2011b). The percentage of shared genetic heritability is even lower for mental wellbeing and externalised psychopathology (Kendler et al. 2011a). Further evidence for the two-continua model is that the predictors of mental illness and mental wellbeing frequently appear to differ (Iasiello et al. 2020).

Importantly, the two continua model does not view mental illness and mental wellbeing as independent and concedes a high level of overlap between the two. This is supported by research that good mental wellbeing helps protect individuals from developing mental illness, and low mental wellbeing has been shown to be associated with an increased probability of all-cause mortality for

men and women (Keyes and Simoes 2012). Increases in mental wellbeing are predictive of later decreases in mental illness (Keyes et al. 2010) and it has therefore been suggested that promoting mental wellbeing in people with a mental disorder might be an important addition to clinical forms of treatment (Iasiello et al. 2019; Schotanus-Dijkstra et al. 2019). The research in this thesis has been informed by this evidence and will, where possible, consider how a range of mental illness and mental wellbeing outcomes differentially represent young people's experiences of mental health within the context of school transition.

2.3 Ecosocial theory as a conceptual framework

A key focus of the research presented in this thesis is understanding the factors that predict mental health outcomes in young people at both the individual and school-level as they transition to a new educational setting. In order to effectively frame this discussion, this research will draw on ecosocial theory as a guiding conceptual framework. Theory-based research helps guide the research process by providing a way to organise and represent information (Shoemaker et al. 2004). However, as theories are themselves constructions they should not be viewed as the one 'true' explanation of reality, but as one of many possible useful conceptualisations (Kaplan 1964). Krieger (2011, p.28) describes theory as like a map: "one can never map reality per se, but one can construct and test different representations of this reality". Therefore, this thesis will use ecosocial theory as a means of organising and framing this research, while acknowledging that it is just one way of doing so.

The ecosocial theory of epidemiology was first posited by Nancy Krieger during the 1990s (Krieger 1994). It explicitly dismisses the biomedical reductionist model of research, but "builds on and extends" socio-political and psychosocial models of health (Krieger 2011, p.163) to provide an overarching model of disease distribution by incorporating social, ecological, political, biological, temporal, spatial and historical factors. Its primary focus is on the mechanisms of current and changing patterns of social inequalities in health by specifically asking "Who and what drives overall patterns and levels of morbidity and mortality?" (Krieger 2011, p.214). Ecosocial theory situates itself from the perspective of marginalised

people, acknowledging that health is created within a world of inequality of opportunity, finance and power and therefore aims to both reduce health inequalities and also change policy and practice (McHugh 2015). It has been applied to a range of public health issues (for example, Smith and Lincoln 2011; Vitrai 2018; Adjaye-Gbewonyo and Vaughan 2019; Hammarström and Virtanen 2019; Vineis et al. 2020). It is particularly relevant to this thesis because young people's mental health develops within the context of an interaction between biological factors and socio-political structures, which creates unequal and unjust distributions of mental health across schools, and society more broadly.

The 'ecology' in ecosocial theory considers "the dynamic social, biotic, and abiotic context in which all organisms (including people) and populations live, interact and die" (Krieger 2011, p.213) It is therefore not solely focused on human ecology, but includes all species "in their many evolved, evolving and endlessly reproducing forms, past, present and future" (Krieger 2021, p.19). Ecological thinking is focused on the connectedness of all species to their environment, interactions across ecological levels, time and space, and the importance of diversity of ecosystems to provide resilience against change, which is vital to the human and wellbeing of humans, as well as the biosphere as a whole (Ghazoul 2020). The 'social' in ecosocial "refers to the sociality of species life, involving the actions and interactions of living beings, within and across species, that affect the terms by which they and other live, reproduce and die" and specifically for people, it also includes the formal and informal rules of society as well as its governance (Krieger 2021).

Ecosocial theory has four core concepts that are used to understand how health inequality is created by ecological and social processes: embodiment; pathways to embodiment; cumulative interplay of exposure, susceptibility and resistance; and accountability and agency. Each of these will now be discussed in relation to this thesis and are illustrated in Figure 2.1.

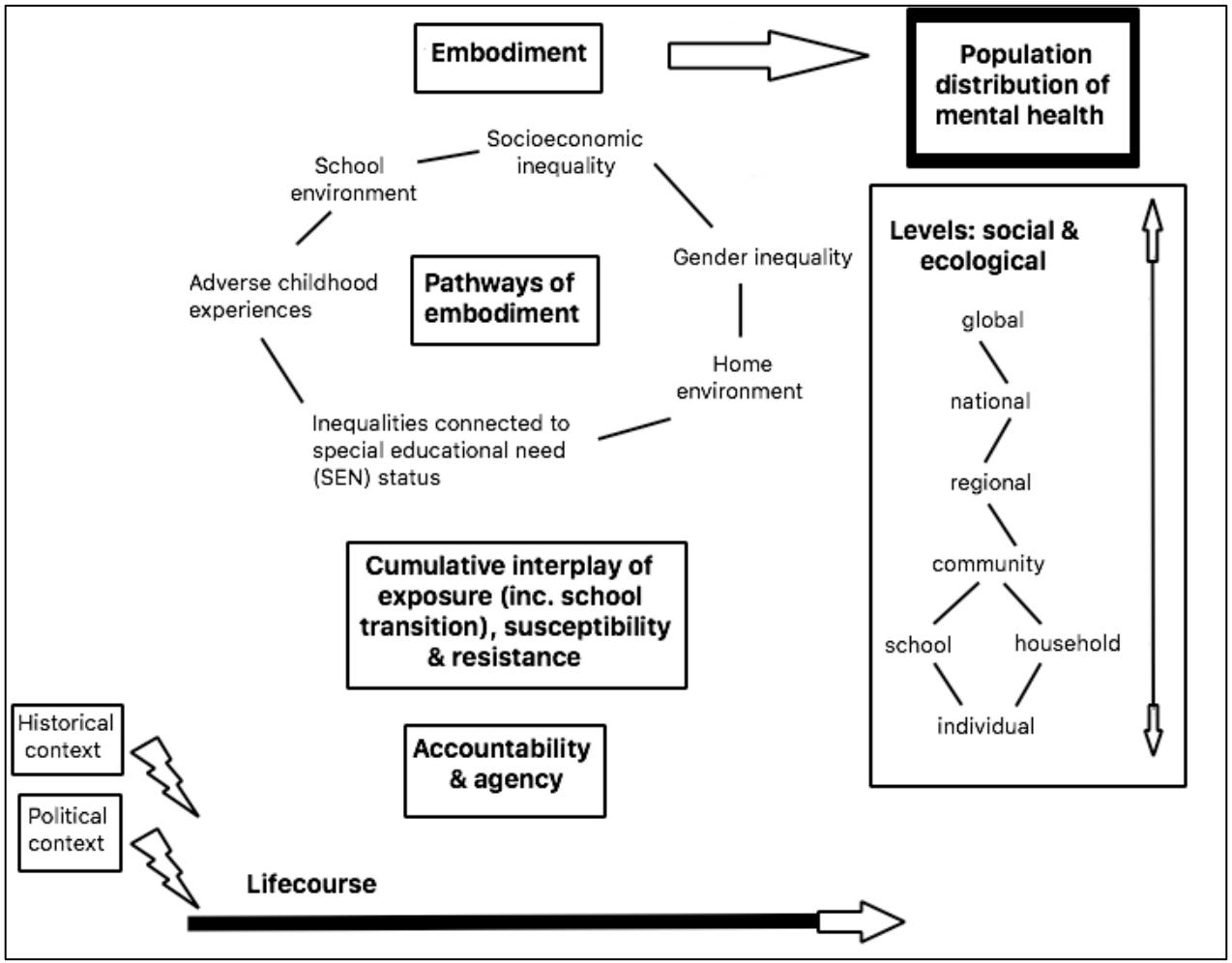

Figure 2.1: Ecosocial theory core constructs, adapted from Krieger (2011). Environment (operating at different social and ecological levels and within historical and political context) interacts with individual susceptibilities, resistance and agency to create pathways to mental health embodiment. Individual embodiment over the lifecourse aggregates to form a population distribution of mental health that demonstrates societal inequality.

2.3.1 Embodiment

Embodiment is the biological process by which the societal and ecological context of daily unjust and beneficial exposures becomes incorporated into the body, creating an “emergent embodied phenotype” (Krieger 2021, p.3). From individual health status comes population distribution of disease. Embodiment can be viewed as a biological bridge between health exposures and health outcomes with the primary predictors of health status being social conditions (Krieger 2011). For mental health outcomes, biological embodiment is intrinsically linked to exposure to stress. Stress then acts through the process of allostatic load to create the “emergent embodied phenotype” of mental health and wellbeing.

Much fluctuation in mental health across our lives is due to a changing internal and external environment. The body changes across the life course through developmental milestones and later life, while the external environment also simultaneously shifts. The body’s response to changing environment requires the body to respond and this provides the basis of the stress response. The term stress has negative connotations, but is a reality of living within changing environments and responses to it are vital for survival (Karatsoreos and McEwen 2011). Allostasis is the regulatory model used to describe the body’s physiological responses to stressors. It is governed by the brain, which ensures that multiple bodily systems and processes are synced in their response to any stressful event. Stress perception takes place in the amygdala and in collaboration with other parts of the brain, results in the release of stress hormones, including cortisol, from the adrenal glands (Haglund et al. 2007). While stressors include behavioural factors, such as the stress placed on the body by a poor diet, smoking or low levels of exercise, clinical medications or treatments, many stressors implicated in the production of poor mental health are psychosocial in nature, including low socio-economic status, lack of social support or negative life events (Beckie 2012). Low socioeconomic status (SES) is associated with chronic stress due to poor living and working conditions, discrimination, a sense of powerlessness and financial worries (Baum et al. 1999).

The term ‘negative life events’ (NLEs) is used to describe events that may be perceived to be stressful by individuals, for example, death of a family member or

close friend, bullying, parental divorce or serious illness. The extent to which they are perceived to be stressful and have a negative impact on mental health is likely to vary depending on the individual, as well as on the timing of the event (Nishikawa et al. 2018). The term is often used interchangeably with ‘stressful life event’ (SLE), although this can obscure the fact that not all ‘stressful’ life events will be stressful for all young people. Adverse Childhood Experiences (ACEs) describe the negative life events that, when occurring in childhood, have been shown to have a long-term impact on young people’s health and behaviour. They tend to therefore focus on the experiences perceived to have the most negative impact on young people, such as abuse and neglect, domestic violence, parental substance abuse or parental mental illness (Hughes et al. 2017). They therefore closely relate to negative life events, although the events included in each varies depending on the scales and questions used. The NLEs scale used in chapter six includes parental death, parent going to prison and serious illness of the child, alongside events that might be perceived to be less severe, such as doing badly in an exam or losing a close friend through arguments (Riglin et al. 2015). There are limitations to the scales used to measure ACEs, for example many involve retrospective accounts and do not weight for length of exposure to trauma or type of trauma (Kelly-Irving and Delpierre 2019). Focusing on ACEs at an individual family level can also lead to the socioeconomic determinants of health being overlooked, which may be more useful predictors of poorer outcomes and more effective targets of intervention (Taylor-Robinson et al. 2018). Young people who experience ACEs are at greater risk of mental illness as well as a range of other health problems (Hughes et al. 2017). Low socioeconomic status is associated with greater numbers of negative life events (Lantz et al. 2005) and within low income families, children who have experienced higher numbers of ACEs prior to school entry are more likely to be members of adolescent trajectories of heightened socio-emotional distress and low school bonding (Sanders et al. 2020).

When allostatic pathways become overused, due to high, persistent levels of stress, the body, including the brain, experience damage associated with allostatic load. It has been described as “the cumulative, multisystem physiological dysregulation resulting from repeated cycles of activation and deactivation of allostasis over the life span in response to stressful life demands”

(Beckie, 2012, p.312). The effects on the body will be wide ranging, including damage within the cardiovascular system, immune system and high levels of inflammation (Karatsoreos and McEwen, 2011). It can also lead to poor cognitive functioning (Seeman et al. 2010) and depression (Karatsoreos and McEwen, 2011).

There are periods during development where the brain and other parts of the allostatic system are more plastic and thus more sensitive to the effects of stress (Engel and Gunnar, 2019). Childhood adversity (e.g. poverty, neglect, parental addiction) interact with social environment and genotype to cause biological and epigenetic changes that persist and make an individual more susceptible to physical and/or mental health problems in later life (Engel and Gunnar, 2019). Furthermore, during adolescence, the brain goes through significant change, with some areas experiencing pruning of up to 50% of synaptic connections and others experiencing neuronal growth (Spear 2013). These brain changes could make the adolescent brain more susceptible to stress (Romeo 2017) and might confer a vulnerability that helps to explain why mental wellbeing often decreases during adolescence and mental illness diagnoses increase (Blakemore 2018). Yet, on the positive side of this, with adolescence as a particularly important time for brain plasticity, it has been described as a "greenhouse" primed to grow psychological attributes (Roeser and Pinela 2014, p.10).

The model of allostatic load therefore represents a longitudinal perspective to the negative effects that stress has on the mental health of an individual, highlighting that an individual who experiences greater stress over their lifetime, and particularly during childhood and adolescence, will have greater risk of poor mental health outcomes.

2.3.2 Pathways of embodiment

The second core concept of ecosocial theory describes the pathways that can lead to population-level embodied inequalities in health. Krieger (1999) argues that these pathways create and structure exposures so that specific groups of individuals are more likely to be negative impacted, resulting in health inequity.

She groups these pathways into six clusters: economic and social deprivation; toxic substances, pathogens, and hazardous conditions; discrimination and other forms of socially inflicted trauma; targeted marketing of harmful commodities; inadequate or degrading health care; and degradation of ecosystems (Krieger 2011).

The previous section has argued that stress is a key pathway by which mental health becomes embodied. However, it does not explain why population distributions of mental health are so unequal - this requires consideration of Krieger's pathways to embodiment - and the pathway of economic and social deprivation is of particular importance to this thesis. Socioeconomic status affects the amount of stress individuals experience, therefore acting as an important moderator of mental health population distributions. The relationship between low SES and mental illness is "one of the most consistently replicated findings in the social sciences" (Hudson 2005, p.3). Individuals with a lower socio-economic status also tend to have lower mental wellbeing than those higher up the social gradient (Huppert 2009), however the relationship between mental illness and SES does appear to be stronger than for mental wellbeing and SES. It has been suggested that the latter might be more sensitive to relative rather than absolute deprivation (Nielsen et al. 2016).

The definition of socioeconomic status is not without contention, however Oakes & Rossi's (2003) definition is helpful in the context of this thesis, with SES viewed as "differential access (realized and potential) to desired resources" (p.775). Measurement of SES has traditionally focused on measures of income, occupation and education, with more recent consideration of contextual measures, such as school-level SES, and creation of compositional measures that seek to take multiple aspects of SES into account (Shavers 2007). Yet Oakes & Rossi (2003), building on the work of others, including Bourdieu (1986), argue that SES should be considered as three different forms of resources: material capital, human capital, and social capital. Thus, by definition, low SES is characterised by low levels of resources.

Stress sits alongside three other key ways that low socio-economic status can negatively affect health: differential access to healthcare; more negative

environmental and social environments; and adverse health behaviours (Adler and Stewart 2010). Yet, these factors also feed into stress responses: people unable to access adequate healthcare are likely to find this very stressful; living and working in unfavourable environments is stressful, and high levels of stress impact upon health behaviours, for example, more use of substances, such as alcohol or tobacco, plus increased consumption of unhealthy foods. Seeman et al. (2010, p.225) highlight, "…a significant and central feature of these biological processes [of allostatic load] is the degree to which they not only relate to major health risks but also exhibit gradients by SES."

The amount of stress an individual experiences is a function of both the frequency and intensity of stressful exposures and the resources available to an individual to respond and adapt to these exposures. People with lower SES experience more stressors whilst also, by definition, possessing fewer resources to respond to them (Adler and Stewart 2010). The conservation of resources (COR) theory suggests that stress should specifically be defined as the loss and threat of loss of resources. COR theory predicts that those people with fewer resources and experiencing more threats to their resources, for example, due to low SES, will be more vulnerable to the impact of stress (Hobfoll et al. 2016). It has been proposed that mental wellbeing is the "balance point between an individual's resource pool and the challenges faced" (Dodge et al. 2012, p.230). Resources are therefore key protective factors that moderate the impact of stressful events on mental health, and two broad types are relevant to this thesis: flexible, e.g. material and cultural resources, and psychosocial resources.

Flexible resources are associated with the 'fundamental causes' theory of health inequality (Link and Phelan 2010). This theory suggests that certain causes of health inequality are fundamental in the sense that they "manifest a unique sort of stability… in the direction of their effect on health" (Valles (2018, p.16) even as mechanisms, health effects and context vary. One fundamental cause of health inequalities is social deprivation, and thus any action to reduce it will always have a positive impact on health: "Fundamental causes are causes we can manipulate with confidence, even if we are ignorant about many aspects of the population health phenomena and their proximate causal dynamics" (Valles 2018, p.111). The enduring relationship between socioeconomic status and health inequalities

is argued to be due to flexible resources - money, knowledge, prestige, power, social connections and freedom (Phelan et al. 2010; Phelan and Link 2015) - that, because they can be used flexibly to respond to changes in risk factors, circumstances and the mechanisms of health production, will always protect the health of those that possess them (Link et al, 2010). This is reflected in the fact that when causes of an illness are known, there tends to be greater social patterning in outcomes, as those with greater resources can access treatments or avoid risk factors more easily. Conversely social patterning is less visible where causes are unknown and therefore how best to use resources is also unknown to those who possess them (Phelan et al. 2010). Cultural resources, which include skills and knowledge acquired from early life through “imperceptible learning” from the family environment (Bourdieu 1984, p.66), are important flexible resources, and are critical to development of agency (Abel and Frohlich 2012). Fundamental cause theory therefore offers the closest thing possible to a universal law in social science, or in the terms of critical realism, a ‘demi-regularity’, which represents an association that doesn’t necessarily hold for all individuals in all contexts (see chapter five for more discussion).

Alongside these flexible resources, individuals also possess psychosocial resources that can be used to respond to threats and challenges, and contribute to good mental and physical health. Crielaard et al. (2021) refer to these as coping resources. Psychosocial resources can be divided into three domains: self and ego related (for example, self-esteem, self-efficacy, ego-strength); personality and dispositional (for example, dispositional optimism, positive affect, hope) and interpersonal and social (for example, social connectedness, social support, social cohesion). Current research suggests that the strongest evidence is for the role of optimism, mastery, self-esteem, conscientiousness, extroversion and social support as psychosocial resources (Taylor and Broffman 2011).

Psychosocial resources can have a direct and indirect effect on mental health. Direct effects are present in the absence of stressors, while indirect effects are present during stressful events and modify the relationship between the stressor and mental health. Social support, for example, has, alongside its direct effects on health, been shown to act as a stress-buffer during stressful times by providing coping assistance and emotional sustenance to reduce distress (Thoits 2011).

Other psychological resources, such as self-esteem, mastery, self-efficacy and feeling less lonely have also been shown to act as stress buffers against depression (Bisschop et al. 2004). Cohen's stress buffering hypothesis argues that social support protects mental health both by reducing negative appraisal of life events and by reducing the psychological effects once a negative appraisal has occurred (Cohen and Wills 1985). Psychosocial resources are so closely entwined with mental wellbeing that at times, the distinction between them is arguably negligible. Positive affect for example, is a key component of mental wellbeing, and yet, is also studied as a psychosocial resource. Positive affect may also broaden people's thought and action repertoires, which opens up opportunities to build a broad range of psychological resources. It suggests that not only is positive affect a 'symptom' of good mental wellbeing, it actually helps to build it (Fredrickson et al. 2008). Similarly, self-esteem has been described as "virtually definitional" in terms of its relationship with mental wellbeing (Taylor and Broffman, 2011, p.9) and many of the mechanisms through which social support acts include building other psychosocial resources of self-esteem and sense of mastery (Thoits 2011). Psychosocial resources are built in childhood as the first step towards future mental wellbeing status and childhood socio-economic status is an important mediator of their development (Gallo et al. 2009).

Young people who have higher levels of psychosocial resources, particularly when these are also held alongside high availability of flexible financial, power and cultural resources, will be better able to moderate the impact of any transition-related stress on the body, preserving mental and physical health. For example, they will be more able to appraise the transition as a challenge that they can tackle, which results in feelings of competence and positive affect, than as a threat that they have no power to overcome, which results in feelings of defeat and withdrawal (Tsai et al, 2019). Young people who can minimise any impact on their mental health or recover quickly from an initial decrease in mental health, can be said to have greater resilience than those who struggle to adapt (Luthar 2006; Kalisch et al. 2015).

While socioeconomic status is an important determinant of the resources a child possesses and the likelihood that transition will be perceived as a stressful event, there are other pathways to inequality which are also relevant to this thesis,

including the impact of having special educational needs (SEN). SEN is a broad term encompassing learning and intellectual disabilities associated with severe cognitive impairment; specific learning difficulties such as dyslexia or dyspraxia; neurodevelopmental disorders, including autism and attention deficient (hyperactivity) disorder (ADHD/ADD); and physical disabilities (Hughes et al. 2013). In Wales the terminology has recently shifted to place a focus on additional learning needs (ALN) rather than SEN. However ALN is a broader concept, encompassing SEN but also including a number of other categories of children, for example, those with gaps in their education, those whose first language is not English or Welsh and those who are young carers (Welsh Government 2022a). As the data collected for the analyses presented in this thesis is SEN rather than ALN data, the focus will be on children that fall within the SEN category. In England, where statements of educational need were replaced by education, health and care (EHC) plans in 2018 as denoting the highest category of educational need, four percent of students have EHC plans, with the most common need being autism spectrum disorder (ASD). Children with SEN but no EHC plan include an additional 12.6% of students and their most common support need involves speech, language and communication support (UK Government 2022a).

Children with special educational needs (SEN) are likely to possess fewer psychosocial resources than typically developing children, including lower self-esteem (for example, Humphrey 2002; Lindsay et al. 2002; van der Cruijsen and Boyer 2021) and lower perceived social support (Humphrey and Symes 2010; Emser and Christiansen 2021). Alongside this, they may have fewer financial resources due to the difficulties of combining work with caring responsibilities - US research found that mothers with a child with an autism spectrum disorder (ASD) had significantly lower earnings than mothers of children without the condition, and children with ASD were 9% less likely to have both parents in employment (Cidav et al. 2012). Having a child with additional learning needs can also cost more for families, and these costs may not be offset by available state benefits (Scope 2019). Having a child with SEN can also increase conflict in the home, and parents of children with ADHD for example are at higher risk of divorce (Wymbs et al. 2008), which also has potential financial, social and mental health implications for the child. Stigma is also argued to be a fundamental cause

of health inequalities (Hatzenbuehler et al. 2013), and young people with SEN may experience greater stigma and find building friendships more difficult as they transition to their new secondary school.

Children with special educational needs are frequently at higher risk of mental health problems than their peers (McMillan and Jarvis 2013; Bryant et al. 2020). UK analysis for example, suggests that children and adolescents with an intellectual disability, are over six times more likely to have a mental health problem than children without this disability, although, the same young people were also more likely to have other risk factors for mental illness (including having experienced multiple negative life events, having a mother with a possible mental health disorder and living in poverty). When these social factors were controlled for, the risk of mental illness decreased, although was still significantly higher than for children without a disability (Emerson and Hatton 2007). Mental health problems are also frequently comorbid with ASD (Lai et al. 2019) and attention deficit hyperactivity disorder (ADHD) (Reale et al. 2017).

There is also gender inequality in mental health outcomes that offers another potential pathway to mental health embodiment. While there are biological factors that influence sex-based population differences in mental health, there are also social factors that result in gender disparity. These differences are likely to be due to a combination of sex-based genetic differences interacting with environment (Belsky and Beaver 2011) as well as gender stereotypes resulting in differing behaviours and expectations (Van Droogenbroeck et al. 2018), although the relationship between gender equity and mental health is complex (Campbell et al. 2021). Children transitioning from primary to secondary school are therefore likely to have gender and sex-specific experiences and their mental health will therefore be differentially impacted.

2.3.3 Cumulative interplay of exposure, susceptibility and resistance

The third core concept in ecosocial theory focuses on the cumulative effect of exposures across the life course with reference to levels, time and place. Mental

health is not created in a moment, but over time as exposures interact with environment and individual. In a review of the life course impacts of depression, for example, Colman and Ataullahjan (2010) highlighted that factors impacting on later development of mental illness start during foetal development due to genetics and prenatal maternal stress. They also include low birth weight and stressful events in childhood, including parental deaths or divorce, childhood abuse and neglect or being witness to domestic violence. As a child ages, risk factors for poor mental health include low SES, lone parenthood, abuse, neglect, intellectual or physical disability, negative relationships and influences within their peer group, lack of parental support, parent with mental illness, divorce/separation of parents, wars and natural disasters (Winders 2014). These exposures have a cumulative effect - one systematic review found that individuals who had experienced four or more adverse childhood experience had around a four times higher risk of developing mental disorders later in life (Hughes et al. 2017).

Repeated stressful events not only diminish available psychosocial (and flexible) resources, they also affect a child's ability to build more resources (Slavik and Croake 2006). This, along with the impact of embodied stress which leads to biological changes and increased vulnerability, results in previous stressors becoming a risk factor for future mental illness (McKeever and Huff 2003). Further added to this is the resource of cognitive bandwidth, which relates to working memory and executive functioning. Under stressful conditions this is diminished making decision making and problem solving more difficult (Mullainathan and Shafir 2014; Crielaard et al. 2021). At the heart of the cumulative exposures concept is the premise, based on Hart's inverse care law that "the accumulation of health hazards tends to vary inversely with the power and resources of the populations affected" (Krieger 2012, p.941). Individuals are constantly negotiating their responses to stressful exposures, at times appearing resistant and at others more susceptible to negative effects. Individuals with greater resources will tend to be more resistant and less susceptible, creating inequalities in the embodiment of mental health.

The predictors of mental health outcomes across educational transitions occur not just at the individual level, but also at school, family, community and societal

levels, and involve interactions over time between these environments. Thus the cumulative interplay of exposure, susceptibility and resistance is considered in terms of societal and ecological levels, time and place, which support a broad and complex understanding of how health inequalities are created. Levels is an ecological term used to describe organisation of species and environment within one system, from the organism at the lowest level, rising to population, then to community and finally to ecosystem (Ghazoul 2020). Societal and ecological levels are described by Krieger as including global, national, regional, area, household and individual. They conceptualise how individuals interact with their environment within and across different levels, resulting in changes both to the individual and the environment itself. The concept of levels is closely aligned to Bronfenbrenner's (1979) ecological theory of human development, which describes how interconnected, reciprocal interactions between environment and individual result in human development. Rather than levels, Bronfenbrenner (1979) terms the environmental context that humans have reciprocal relationships with as the microsystem, the mesosystem, the exosystem and the macrosystem.

The microsystem encompasses settings where an individual actively participates. For children and young people, the key settings of their microsystem will be home and nursery or school (Bronfenbrenner, 1979). The mesosystem is a “system of microsystems” (Bronfenbrenner, 1979, p.25) which includes the microsystems within which the individual actively participates and the links and relationships between the microsystems (Shelton, 2019). The exosystem includes settings that young people may infrequently, or never enter, but which still have an influence on them (Shelton, 2019). Finally, the macrosystem consists of the culture or subculture along with its associated ideologies that an individual is living within.

There are a number of key differences between ecosocial theory’s ‘levels’ and Bronfenbrenner’s ‘systems’. The first is Bronfenbrenner is solely concerned with multi-level human phenomena, which excludes other parts of the ecosystem, including other species and biological processes, many of which have clear and important impacts on human health, whether pathogenic or life-sustaining (Krieger 2021). Secondly, Bronfenbrenner assumes that social hierarchies are nested, when in reality, there are non-nested hierarchies, particularly those associated with power (Allen and Starr 2017). A nested hierarchy assumes that a

higher level is composed of the lower level, and therefore teachers and students are nested within schools, which operate at a higher ecological level and consist of these different individuals. Conversely, within a school, a teacher would generally be perceived to have a higher hierarchy than a student, and a head teacher higher than a classroom teacher, but this is a non-nested hierarchy because they are all operating at the same ecological level and a head teacher does not contain or consist of either students or other staff members. Any influence that the head teacher has over the school is due to power. Furthermore power hierarchies, unlike nested hierarchies are not fixed, but can shift as power dynamics change (Krieger 2011; Allen and Starr 2017). Thus it would be possible to students to exert power over their teachers and to have greater influence over the school environment than staff members, but it would never be possible for schools to become nested within students because students will never be composed of schools. Ecosocial theory also does not assume that levels act sequentially or only via adjacent levels, thinking which, Krieger suggests obscures the "intermingling of ecosystems, economies, politics and history, and specific exposures and processes at every level, macro to micro, from societal to inside the body" (Krieger 2008, p.227). Therefore, 'levels' is a broader conceptualisation of human-environment interaction than offered by Bronfenbrenner.

As well as levels, time and place are important in considerations of how pathways to embodiment created embodied health inequality. Of central importance to any consideration of epidemiology and production of population distributions of health is life course theory (Elder 1998). From conception and throughout life, an individual follows their own unique path, and this path, or 'trajectory', will be informed by genetic, epigenetic and biological factors, as well as environmental, social, historical and cultural context. Life trajectories are rarely straight lines but are punctuated by life events and transitions, that affect future behaviours, choices and health outcomes. Life course theory brings these realities together to provide a longitudinal perspective on how lives are constructed. George (1993) describes the life course as "a social phenomenon… [which] reflects the intersection of social and historical factors with personal biography" (p.358). An individual will be living within multiple trajectories that intersect with each other, for example, trajectories for education, family life and career (Hutchison, 2014).

Time should also be considered in terms of the historical generation of health outcomes (for example, educational policy decisions many years ago may influence transition experiences today) and also in the context of aetiological period - how long it takes from exposure to disease development (Elder 1985). This might itself be linked to age at which an individual is exposed, and is relevant for mental health as stress at an early age may be more damaging than later in the life course (Nelson et al. 2020). Place refers to the settings and geography in which lives are lived, but should not be viewed as spaces with clear boundaries but as fluid spaces with dynamic rather than fixed characteristics constituted by social relationships as well as physical attributes (Cummins et al. 2007). Schools as places that influence mental health are therefore not fixed in their affluence or student composition, neither are they separate from the other places in which students spend their lives - home, community - and they are created by the interactions between students, staff members and other actors.

This thesis is concerned with how different individual characteristics, particularly those associated with lower psychosocial and flexible resources (for example, socioeconomic status, having special educational needs and experiencing negative life events) increase and decrease susceptibility and resistance to poor mental health and wellbeing with reference to one specific exposure - school transition - where school transition is experienced not as an exposure in isolation, but within a life course. The resources required for a young person to successfully navigate the transition without negative impacts on their mental health is both a function of the baseline level of resources held by that individual, and how stressful the transition to that particular school is for that particular child, i.e. it is a function of the interaction between child and school environment. In this conceptualisation, children and schools are levels within the ecosystem, with other levels, including family, community and society also influencing mental health outcomes and inequality. Schools also function as a setting, where mental health of students may be supported or neglected, and therefore have a vital role in creating environments where transition is less stressful for students, particularly students from low SES backgrounds. While increasing the resources held by young people is one strategy for reducing the burden of transition on mental health, the other is to reduce the resources that students need, by making

transition less stressful in the first place. Where schools can do this, it has the potential to reduce mental health inequalities, as it will be most beneficial for children with lower psychosocial resources, including young people from low SES backgrounds and those with special educational needs.

School transition as an exposure also has to be viewed over time as on-going process, not one off event. The transition begins before the actual physical move of schools, as young people are supported (or not) to prepare for the move, potentially experiencing anxiety or excitement, through the actual physical move and their first day in their new setting, and can last many months as they learn about the new setting and how to navigate it (Jindal-Snape 2016). Within each educational transition are many other transitions - for example using a school bus or travelling to school alone for the first time, new student-teacher relationships, new peer relationships, new subjects and curriculum, more independence and responsibility. Not only are there multiple transitions within each transition, but Jindal-Snape et al. (2020) use the analogy of a Rubik's cube to highlight that children live within a "dynamic ecosystem" and as one part of their life shifts, it has impacts on all other domains. School transition sits within the context of everything else going on a in child's life, including the transitions others close to the child are experiencing, and is just one exposure that may influence mental health outcomes, and population-level mental health inequality.

2.4 Summary and conclusion

This chapter has reviewed definitions and measurement of mental health and wellbeing and introduced the first three concepts of ecosocial theory. These concepts have been used to argue that stress creates the link between social environment and biological embodiment, how and why socio-economic status is a determinant of mental health and that school transition can be considered to be an 'exposure' that occurs within the life course. The next chapter will look specifically at the school environment as a level that influences the stress associated with school transition and argue that cultural incongruence across transitions results in stressful transitions for young people from low SES backgrounds. It will also introduce the final core concept of ecosocial theory -

accountability and agency - and review evidence of the impact of school transitions on mental health.

3. School environment, educational transitions and mental health

Normative educational transitions can negatively impact upon young people's mental health and exacerbate health inequalities in society. This includes transition into school, transition between schools and transition into university. The previous chapter offered ecosocial theory as a means of structuring thinking around how health inequalities might be widened by transition to new educational settings, focusing on the first three of its four key concepts as applied to this research:

1. Mental health embodiment due to stress;
2. Socioeconomic status, special educational needs and gender inequality as possible mediators of stress and pathways to embodiment;
3. School transition as an exposure that, along with other exposures experienced across the life course, may produce a stress response and has effects that accumulate to influence an individual's mental health trajectory.

This chapter will build on the structure provided by ecosocial theory and specifically aim to develop the third concept further, by considering how resistance and susceptibility to the effects of the school transition exposure might be influenced by school environment as an ecological level. It will then consider the fourth and final concept of ecosocial theory - accountability and agency - and finish by summarising evidence on the effects of school transition on mental health. This chapter will primarily focus on the primary to secondary school transition as this is the transition represented in all three empirical chapters. Transition into school, and transition to university, which are included in the systematic review (chapter nine) will have less of a focus, although evidence of their impact on mental health will be reviewed towards the end of this chapter.

3.1 School as an ecological level

As introduced in the previous chapter, ecological levels are a means of conceptualising how young people, situated within families and moving between educational settings, interact with their immediate and distal ecological

environment, to create embodiment of health in the individual. Schools, through their function as an ecological level, have the power to moderate or exacerbate the impact of transition on mental health outcomes (Tilleczek and Ferguson 2007). At the most superficial level, schools can attempt to improve mental health outcomes by building a child's familiarisation with the new school environment through a wide range of activities, including but not limited to open days, residentials, information sharing between schools, opportunities to meet and work with students transitioning to the same school from other primaries and assignment of buddies (Jindal-Snape 2016). There is some evidence that maintaining a close friend across transition can also support mental health outcomes (Ng-Knight et al. 2018) and parental participation in the transition process is also advocated (van Rens et al. 2018). The use of creative methods, including music, drama, game-based approaches and visual arts to encourage student voice, agency and engagement across the transition period (Jindal-Snape 2016) may have particular value in reducing worry about the transition process. A recent qualitative systematic review of children's experiences of the primary to secondary transition in England found that they frequently expressed a desire for more specific transition support, particularly in managing changing relationships (Mumford and Birchwood 2021). Harris and Nowland (2020) argue that schools should provide opportunities for transitioning students to alleviate worries and start to build friendships prior to starting their new school, with additional time spent on familiarisation for children with SEN.

There are currently no legal obligations for primary or secondary schools in England to provide transition support for students (Department for Education 2022b). However, in Wales, using powers granted under the 2002 Education Act, in 2006, the Transition from Primary to Secondary School (Wales) Regulations made it a requirement for maintained secondary schools and their feeder primary schools to jointly draw up transition plans to support the transition of pupils from primary to secondary school (Senedd Cymru 2006). These regulations were recently updated (Senedd Cymru 2022). The new legislation specifically states that transition plans should consider not just continuity of learning, but also wellbeing needs of each child. An evaluation of transition planning in 2010, prior to this new legislation, found good evidence of uptake and that the plans were having a positive impact on pupil experiences, however the focus was primarily

on educational outcomes, with much less mention of potential benefits to mental health (Estyn 2010). Young people with SEN tended to receive greater support over the transition period than other students (Estyn 2010).

It is likely that many schools already carry out a range of universal transition activities, although it is unclear the extent to which they may support mental health. Neal et al. (2016) for example, investigated how existing transition strategies experienced by young people transitioning to nine secondary schools in South East England (the same dataset used in the STARS analysis in chapter six) were associated with anxiety post-transition. They coded transition strategies as either behavioural (e.g. whole-class visits to secondary school, increase in homework in year 6, teaching secondary school vocabulary), cognitive (e.g. use of web-based resources, provision of written information about their new school), systemic (e.g. peer support groups, project work bridging transition, meetings with parents) and those specifically focused on young people with SEN (e.g. transition review meetings, sharing written information with secondary school about pupil needs, liaison between primary staff and secondary special educational needs co-ordinator). They found that on average children experienced three cognitive, four behavioural and three systemic strategies. Only systemic strategies were associated with lower school anxiety post-transition, and none of the strategies was associated with lower generalised anxiety post-transition (Neal et al. 2016).

However, more fundamentally, it can be argued that schools should be aiming for whole-school approaches that are sustained over time (Goldberg et al. 2019) and create a culture and environment that promotes belonging and connectedness for all children. A whole-school approach involves mental health being embedded into the cultural and structural fabric of the school rather than just tackling risk factors associated with poor mental health. Whole-school approaches to mental health have been shown to be effective at improving child social and emotional adjustment, behavioural adjustment and internalising problems (Goldberg et al. 2019). Spratt et al.'s (2006) qualitative study suggests that when attempts to support child mental health and wellbeing is seen as an add-on to normal practice without significant revision of policies and procedures, they were likely to result in tensions between the dominant aim of the school - typically academic achievement - and mental health being prioritised. Specifically, the study found

tensions between mental health priorities and: curriculum and pedagogical methods (i.e. impacts on self-esteem or stress were overlooked if methods were perceived to support academic outcomes); the perceived role of pastoral interventions (often aiming to teach students to conform to school systems in order that academic achievements were maintained, rather than considering how the school system could change to support the child); discipline (often seen to seek exclusion of those with poor behaviour to prevent disruption of academic progress, rather than to understand the possible mental health difficulties that might be creating the behaviour); and teacher-student relationships (teachers were often perceived by students to only be interested in supporting them with academic needs). Therefore a school culture that supports young people's mental health will ensure that mental health promotion is not in tension with academic achievement, but understands that where students have good mental health, academic achievement will also be supported. Quality of the school environment (level of support and respect from teachers, regulation of poor behaviour and monitoring of student learning) as perceived by students transitioning to high school, has been shown to be closely associated with youth functioning (Barber and Olsen, 2004).

A whole-school approach to mental health therefore aims to ensure that mental health is prioritised across departments, year groups, teaching and administration (Goldberg et al. 2019; Welsh Government 2021). This approach does not rely on changes to the child or the child's family, which may be differentially received depending on willingness to engage and participate, but allows universal, systemic change to occur that should benefit all children entering the new school (Spratt et al. 2006). A school environment that creates a sense of belonging and connectedness for young people entering the school should require fewer psychosocial and flexible resources to navigate, resulting in children who have fewer of these resources to start with being at less of a disadvantage and more able to transition successfully.

School culture refers to the "values, attitudes and behaviours characteristic of a school" (Bisset et al. 2007, p.485). Young people will also have a 'home' culture that determines the values, behaviours and beliefs promoted in their families and communities, and when transitioning to a new school may find that these two

cultures are in opposition to each other. A mismatch between cultures may be associated with socioeconomic status. Bourdieu (1977) argues that the education system reproduces the structural inequalities of society by requiring individuals to understand a cultural code of what is required in order to succeed. While young people from middle class backgrounds may have been taught this code implicitly through “imperceptible apprenticeships from the family upbringing” (p.495), young people from less affluent and less educated families may not have the same cultural resources. Freire (1993) argues this point even more strongly, suggesting that students from low SES backgrounds experience a “cultural invasion” (p.68) from the educators that seeks to convince students of their cultural inferiority, remove agency and preserve oppression. Schools thus become “venues where intersecting power relations routinely privilege some students over others” (Collins and Bilge 2020, p.194). Young people are stratified into attainment bands which identify them from an early age as more or less deserving of particular future education or employment, with decisions made based on the priorities of the dominant middle class.

The concept of reproduction is further supported in the concept of the “hidden curriculum” - that schools are not solely teaching the original, explicit curriculum, but also a system of values, beliefs and norms (Giroux 1983). Examples include putting up photos of children who have succeeded in sports or music to underscore the value placed on these achievements, or appointing prefects to create internal pupil hierarchies based on behaviour and attainment. In 2022, to celebrate the Queen’s platinum jubilee all primary school children in state-funded schools in England were given a book on the monarchy to celebrate the Queen’s platinum jubilee, arguably seeking to reinforce ideas about the role and importance of the monarchy to future generations (Department for Education 2022a). This hidden curriculum is present throughout the educational lives of young people, starting when they first transition to school, and can act to reinforce societal inequality within the classroom or lecture theatre by reinforcing societal ideas about who deserves to succeed and the types of jobs open to different types of students (for example, based on affluence, ethnicity or gender) (Chafel 1997). Furthermore, young people from more affluent backgrounds have “a reservoir of cultural and social resources” (Margolis et al. 2001, p.8) at their disposal that enable them to decode the new school environment and ultimately

support educational success. Where the new school culture is very different to a child's home culture and has hidden discourses and expectations, transition would be expected to be more stressful and require more psychosocial resources and other flexible resources (such as social capital) to maintain good mental health.

The school environment is therefore a potential target for intervention to improve young people's experiences of transition, particularly those from low SES backgrounds. If the school culture can retain its educational potential while being delivered in a way young people from poorer backgrounds can relate to and feel included in, transition should be less stressful and alienating. Research into how schools exacerbate health inequalities suggests that two aspects of school culture that could be focused on to support this equalisation of cultures are school classification and school meaningfulness (Bernstein 1975; Nussbaum 1990; Markham and Aveyard 2003; Markham 2015).

3.2 School classification and school meaningfulness

Bernstein (1975) suggests that the school can be viewed as a social institution that seeks to transmit two cultural 'orders' to its students - the instructional order (pertaining to cognitive development and academic achievement) and the regulatory order (pertaining to affective development and the development of values, beliefs and rules). Where young people are able to commit to the instructional order, they will be able to build practical reasoning, and where they can commit to the regulatory order, they will build affiliation (Markham and Aveyard 2003). Practical reasoning involves being able to manage, plan and evaluate our own lives; affiliation involves forming attachments to others. Nussbaum (1990) suggests that these two capabilities are central to leading a flourishing life and that they organise all other necessary capabilities: "Practical reasoning is both ubiquitous and architectonic. It both infuses all the other functions and plans for their realization in a good and complete life. And the same is true of affiliation. We do whatever we do as social beings" (p.227). Schools are central to building practical reasoning and affiliation in their students, and in so doing, provide them with the resources and skills necessary to choose to make

decisions that will support their health and wellbeing across the life course (Markham and Aveyard 2003). These two resources therefore support students to build agency (see section 3.3).

The concept of school classification was first introduced by Bernstein (1975). He proposed that classification relates to “relationships between contents” and where classification is strong, “contents are well insulated from each other by strong boundaries”, while where it is weak, “boundaries between contents are weak and blurred” (p.88). He argues that classification is maintained by power inequality and used as a form of social control, and that it tends to increase at school transitions. By reducing the strength of classification, power inequality will also be reduced, which Bernstein believed would improve student outcomes. Markham and Aveyard (2003) build on the work of Bernstein (1975) and explicitly state that classification relates to four types of boundary: boundaries between the school and outside community; boundaries within the school between staff and students; boundaries between students; and boundaries between academic subjects. They connect classification to health by arguing that strongly classified schools may prevent students from experiencing multiple realities and therefore inhibit their ability to develop practical reasoning and affiliation, thus making it more difficult for them to be autonomous and choose good health. Weakly classified schools, they suggest, enable the values of the community (and its pupils) to converge with school values, making it easier for students to commit to the school orders.

In practice, weakly classified schools encourage pupils to participate in school decision-making; encourage greater communication and participation in groups of different ages and backgrounds, and foster greater learning in breadth. They are more likely to avoid policies such as streaming based on ability that create boundaries between pupils, and to have increased extra-curricular activities for pupils, peer tutoring, mixed ability and year group classes and promote fair play among staff (Markham 2015). Importantly, they also tend to have stronger partnerships with agencies from outside the school as well as parents (Markham and Aveyard 2003). By prioritising students’ personal and social development, rather than just focusing on academic achievement, weakly classified schools value a much broader range of school identities than a strongly classified school, making it easier for students to feel that they belong (Markham 2015). This would

be expected to relate strongly to feelings of school connectedness, which includes sense of belonging and positive social relationships (Lester et al. 2013), as well as mental health and wellbeing outcomes.

Markham's (2015) development of Bernstein's (1975) model adds school meaningfulness as an important additional factor that influences whether pupils are able to connect to their school and build the key capabilities of practical reasoning and affiliation. Meaningfulness, which can be assessed from a school and individual level, reflects whether what a school is trying to achieve for its pupils reflects what pupils want it to achieve. High meaningfulness schools are perceived by the communities they serve as being able to meet their aspirations in terms of educational success and opportunities for personal and social development. Low meaningfulness schools are not perceived as meeting the expectations of the communities they serve and students are less likely to commit to the school orders or to adopt a valued school identity. Weakly classified school are typically more likely to be highly meaningful schools than strongly classified schools because they have more permeable boundaries with the local community and are more likely to provide opportunities for the community to set the school agenda and engage in school life (Markham 2015). This connection is also made by Shackleton et al. (2017, p.249) who state that "[school] boundaries can best be understood as asymmetries of power or resource allocation" but that by eroding these boundaries, "school then becomes more relevant to the student's own experiences, cultural values and aspirations" (i.e. more meaningful).

The concept of meaningfulness draws on Merton's (1938) theory of anomie, which argues that inequality of opportunity to obtain one's aspirations in a legitimate way leads to deviant behaviour. In line with this, when a school has high levels of meaningfulness for students, there is evidence to suggest there are lower levels of substance misuse and smoking (Markham 2015). It would be hypothesised that schools with high levels of meaningfulness and weak classification would have better student mental health outcomes, as the latter would be more likely to commit to the school orders, feel a sense of belonging and be able to build practical reasoning and affiliation.

If young people fail to connect to their school, a process of alienation may occur. School alienation works on both the cognitive (beliefs, knowledge, assumptions and judgements) and emotional level of an individual and may involve alienation from teachers, classmates and/or learning (Hascher and Hadjar 2018). In a US-based phenomenological study of males aged 16-19 who self-identified as being alienated from the school system, Schulz and Rubel (2011) found that the first step towards alienation was an inability to progress academically. The students then found themselves growing increasingly uncertain, distrustful and fearful of failure. In order to meet their social and emotional needs they looked to others like themselves who exhibited anti-school attitudes: “They believed the consequences of choosing social acceptance and belonging over academic progress was the less hurtful of the two options.” (p.290). The school environment can thus be described as having either a centripetal or centrifugal force on students (Fletcher and Bonell 2013) either drawing students inwards into the school orders, or outwards, away from the school norms and the benefits of education and potentially towards environments and behavioural choices that produce health inequalities.

Being able to have a positive transition experience and commit to the cultural orders of the new school is important, not just for immediate mental health outcomes, but also because it makes a child more likely to obtain an education. Maintaining mental health across the life course requires resources, and education is one of the most important sources of resources, with the advantages of education being the greatest for those for whom gaining it may be hardest. Ross and Mirowsky (2006) theorise that education has the biggest impact on individuals with the lowest resources through a process called resource substitution. Resource substitution suggests that the presence of one resource makes the absence of another resource less harmful. Education can provide individuals with resources that can substitute for others that might be absent - i.e. education builds the flexible resources that are described in fundamental causes theory (Link and Phelan 2010). In support of this, it has been shown that education mitigates the effects of low socio-economic status on health (Ross and Mirowsky 2011) and can help individuals to overcome the negative health impacts of a disadvantaged family background (Schaan 2014).

School transition is a key moment when young people are first exposed to the school orders of their new educational setting. It is therefore unsurprising that it is a point when some students begin to disengage from education (Hascher and Hadjar 2018) and mental health inequalities are at risk of widening (Moore et al. 2020). Therefore in order to promote successful transitions for all students, schools may need to weaken their classification by ensuring that the cultural orders of the school are increasingly co-produced by pupils, parents and teachers, creating a more fluid cultural membrane between school and community where values and expectations can freely diffuse and schools can become increasingly meaningful for students and their families. This is relevant for students from low SES backgrounds, as well as students with SEN whose educational needs and aspirations may differ from those of other students, but who still need to be able to commit to the school orders and feel that their school's aims for its students are meaningful to them if they are to gain the most possible socially, academically and emotionally from their school life.

While Bernstein (1975) and Markham and Aveyard (2003) are primarily concerned with secondary school culture, the concept of commitment to the school orders and the importance of school environment being culturally accessible and acceptable to students from different backgrounds is equally relevant to transitions into primary school and university. In the case of the former, children from poorer backgrounds may be less likely to have experienced childcare in a 'school-like' format prior to entering school than those from more affluent backgrounds (Campbell et al. 2019b) and therefore the transition into school represents a bigger change in how they spend their days than when transitioning between two different types of school.

3.3 Agency and accountability

The fourth core concept of ecosocial theory incorporates both agency and accountability. This concept considers power at each of the societal and ecological levels over time to question who and what is responsible for health inequalities. At the heart of questions of agency and accountability is the agency-structure debate, which questions the relative contribution of each to the decisions individuals make about their lives (Cockerham 2005). In critical realism,

structure and agency are viewed as separate but acting in interaction with one another. Margaret Archer, an important critical realist researcher argues that social structures are emergent as outcomes of agency, and that they then take on their own causal powers (Parker 2000). While individuals retain the agency to act against the structural conditions of their lives, true agency, devoid of structural pressures is a “chimera” (Wistow et al 2015, p.21), and culture additionally operates alongside structure to “constrain and enable agents’ activity” (Alderson 2021, p.78).

Societal structures differentially empower different groups due to an unequal distribution of flexible and psychosocial resources (Abel and Frohlich 2012). As Thoits (2006, p.318) argues: “People’s positions in the social structure equip them (or not) with resources that enhance (or inhibit) the exercise of agency, and they are able to act (or not) in their own best interests only within social and cultural constraints that are themselves unequally distributed by social status.” Thus agency is always tempered by structural constraints which affect both resource distribution as well as the range of possible opportunities or ‘capabilities’ that an individual can exert agency over (Sen 1999). At the macro-level, the UK’s capitalist system has been described as “structurally pathogenic” (Sell and Williams 2020, p.1) while Davies (2022) views capitalism as having an agenda to shift the burden of tackling poor mental health from a focus on the structural conditions of society and onto the individual. Socioeconomic status is one of the most important social structures and a powerful determinant of health outcomes (Link and Phelan 2010; Valles 2018). Thus, the health of individuals within a population is not random and uncoordinated as would be expected if individuals had true agency, but exhibits patterning based on social factors and genetic inheritance.

Mental health outcomes are subject to the agency-structure debate within public health. Thoits (2006) has argued that individuals make deliberate efforts to remove stress from their lives in order to maintain their mental health. She highlights that events often seen to be negative, such as divorce or redundancy, can actually be deliberate choices made by individuals seeking to improve stressful situations in their lives. However, these choices remain limited by structural constraints. The resources and options available to an individual are

based on social structuring, and these determine whether or not they can exercise agency in these stressful situations. The same 'negative' events (divorce, redundancy) are less likely to be an expression of agency for individuals with lower resources and more likely to be due to decisions made by others. Furthermore, there is also arguably a direction of effect from mental health to agency, where individuals with better mental health are "better able to set goals, initiate and persevere in desired lines of action, and engage in problem-solving efforts" (Thoits 2006, p.312). Thus while high levels of agency enable individuals to maintain their mental health, good mental health also supports application of agency.

In terms of school transition and the production of mental health through the transition process, agency and accountability lie across levels, and are not static over time. At the individual-level, young people are "not merely passive vessels" and often exhibit agency over their lives within a school context that contradict expected patterns (Margolis et al. 2001, p.16). They may even be able to limit the possibilities of those acting at higher hierarchical levels within the school due to their larger numbers (Allen and Starr 2017). However, power is not equal across levels and ecosocial theory argues that "macrolevel phenomena are more likely to drive and constrain meso- and microlevel phenomena than vice versa" (Krieger 2011, p.225). Thus young people's mental health is highly dependent upon school environment, as determined by teachers and political arrangements: educational institutions remain powerful "to manage contestation, reproduce hierarchy, and resist change" (Margolis et al. 2001, p.17). A strongly classified school is, by definition, demonstrating power inequalities through its clear hierarchy and students may struggle to exert agency within that environment. Yet, even within a strongly classified school, young people for whom the new school culture represents a societal structure that is familiar and supportive of them, will feel more agency over the transition process. For young people from low SES backgrounds, the new school environment is perhaps more likely to reflect a dominant societal culture that constrains their agency.

Agency is created in interaction with environment and schools have an important role in building agency in students. Education is a key means of creating individual agency by building resources, both psychosocial, for example, sense of

control, and flexible, including financial and cultural resources (Mirowsky and Ross 2003). Nussbaum's (1990) two core capabilities, practical reasoning and affiliation, which are developed when students commit to the school orders (Markham and Aveyard 2003) are so important because they build agency in students so that they can make healthy choices in their lives. Vaughn (2020, p.115) argues that agency is created through co-produced learning experiences where students are able to “share their voice, histories, cultural identities, experiences, languages and interests”. Therefore the extent to which young people can exert agency in their educational lives is likely a reflection of whether they have been provided with opportunities to have agency by those teaching them, and have learnt that it is an option - something less likely to have happened for disadvantaged students (Vaughn 2020). Devlin and McKay (2014) argue that universities for example should take on a role of being explicit about academic discourse, both its language and conventions, to bridge the cultural incongruence of the transition, and build agency in students. This also applies to secondary schools and suggests that it is necessary to be explicit about giving students permission to have a voice and be open about their cultural backgrounds. However, it is worth noting that while education is central to the development of agency, it also feeds back into structural inequality by creating social patterning and socioeconomic differences between people. Young people are stratified early in their school careers based on subjective determinations about ability made by the dominant class.

Specifically considering transition, creative approaches that encourage young people to actively participate in the transition process may also build agency (Jindal-Snape 2016), which would extend to decisions about what would best support their mental health and wellbeing. As weakly classified schools have weaker boundaries between students and teachers, they would be hypothesised to be better placed than more strongly classified schools to provide an environment where young people have greater voice and involvement in the transition process. Therefore schools have a large role to play in supporting young people’s mental health over transition, by weakening classification, ensuring high levels of school meaningfulness and also by building agency over the transition process so that young people can make choices that positively support their own mental health. Accountability for mental health inequalities

arising from the school transition process therefore lie most heavily with structural systems rather than the individual child or family. Schools as well as local and national government have an important role to play in creating cultures that enable every child to commit to the school orders and to find school life meaningful and worth engaging in.

Finally, consideration of accountability also has to consider the power of the researcher, by highlighting the subjectivities and values that might come into what is researched and what is reported (Krieger 2021). As McHugh (2015, p.78) states: “these are choices for which researchers and public health officials have accountability and agency and these choices contribute to health inequalities”. This will be considered in more depth in the chapter five.

3.4 Evidence of impact of transition on mental health outcomes

This thesis has so far focused on framing school transition within the theoretical framework of ecosocial theory, while also drawing on understandings of how school environment might affect mental health across the transition process. It has not yet provided empirical evidence of the factors that influence mental health over educational transitions. Evidence for three different transition types will therefore be reviewed in the next section: transition into school; transition from primary to secondary school; and transition from school into university. As the primary focus of this thesis is the primary to secondary school transition, research on this transition will be described in most depth.

3.4.1 Entry into school

The transition into school at approximately age four represents a child’s first experience of formal education and where they first form impressions of the school environment and their place in it (Bailey 1999). Children take on new roles as learners and begin to establish an academic self (Alvidrez and Weinstein 1993). It therefore has relevance beyond those initial years, potentially influencing educational outcomes across the life course. It is also a period of stress for young children, demonstrated by increased levels of hair cortisol in hair sections that

grew in the two months after school entry compared to hair sections that grew in the two months prior to starting school (Groeneveld et al. 2013).

Experiences of transition into school are often linked to assessments about 'school readiness', which often reflects academic, emotional and behavioural concepts (Duncan et al. 2007). Mental health problems at school entry contribute to, and are inextricably linked to, lack of school readiness - they constitute the emotional and behavioural components of school readiness while also influencing academic readiness. A relatively high proportion of children may already be experiencing poor mental health at school entry: in an Australian sample of 500 young children assessed from 1.5 to 5 years, three distinct trajectories of mental health symptoms were found for externalising and internalising problems - high, average and low. For externalising problems, approximately 20% of young people had higher than average scores across the four time points, and a similar proportion of children (21%) had higher than average internalising problems over the same time period (Bayer et al. 2012). Externalising behaviour problems prior to school transition are predictive of school suspension seven years later (Pressler et al. 2016).

Williams et al. (2019) argue that school readiness however shouldn't be considered to be solely an attribute of the child, but also include the school's readiness to accept a child and family readiness to support transition and child development. It is therefore a concept that involves reciprocal interactions across levels that is produced in context and over time. It represents a fit between individual and school with both being willing to adapt to each other's needs and requirements (Jindal-Snape 2016), and replicates arguments about the need for cultural congruence between a child's home life and the school environment. School readiness is a well established predictor of future academic outcomes (Pan et al. 2019) including school dropout (Engle and Black 2008), as well as increasingly being linked to future child and adolescent wellbeing (Gregory et al. 2021).

Socioeconomic status is one of the most important predictors of school readiness. This is likely a function of how readiness is defined and what children are being readied for as it is the dominant class that defines which attributes children need

to possess to begin formal schooling. Data from the UK Millennium Cohort Study suggest that one in ten young children are not school ready by age three, with low SES predicting low school readiness (Camacho et al. 2019). Children from low income families are more likely to start preschool with emotional and behavioural difficulties (Li et al. 2017; Comeau and Boyle 2018), and notably, poverty-related risks in early childhood, which have a cumulative impact on young people have been shown to be predictive of risk of grade retention (being held back a school year) seven years later, even after controlling for school readiness at school entry (Pressler et al. 2016). While many family-level risk factors for poor child mental health outcomes are not solely experienced in low-income families (for example, maternal depression, domestic violence and maternal substance abuse), the stress associated with poverty plus having fewer resources to buffer the effects of these factors, means that they will often have a greater impact on children from low SES backgrounds (Azzi-Lessing 2010).

Special educational needs (SEN) may not have been diagnosed prior to the start of school. In the UK a recent study found that the median age of autism diagnosis is approximately 55 months, with a range of seven to 223 months (Brett et al. 2016). Even where a child is identified as requiring assessment, there are typically long waiting lists that cause further delays (The Guardian 2022). However, there is evidence that school readiness profiles can be used to identify children with a broad range of SEN prior to entry with school, with these children demonstrating higher problems with daily living skills, language, cognition and behavioural adjustment (Hughes et al. 2018).

Parenting is also an important predictor of child school readiness. A study by the NICHD Early Child Care Research Network (2004) found that fathers who were sensitive and supportive of their child's autonomy, and mothers who supported self-directed child behaviour, significantly predicted teachers' perceptions of child competency, behaviour problems and social skills across the transition to school. Maternal stress and harsh discipline have also been found to be two of the most important predictors of internalising and externalising problems in five year old children (Bayer et al. 2012). Parenting behaviour may mediate the relationship between family risk factors and child outcomes (Oberklaid et al. 2013).

School environment is also an important mediator of a successful entry into school (Bondy et al. 2007) and providing a positive transition involves action on the part of schools, including being committed to meeting the individual needs of children from different socioeconomic and cultural backgrounds (Williams et al. 2019). Provision of high quality pre-school education, particularly for children from lower SES families can help prepare children for transition and is an important and consistently effective means of improving child cognitive and social outcomes (Camilli et al. 2010), including reducing health inequality in adulthood (Reynolds et al. 2011). Yet evidence suggests that poorer families are less likely to access 'free' pre-school education in the UK, in part because there are often hidden costs for families (Campbell et al. 2019b).

School entry is thus an important life event for young children that occurs early in the life course but is already influenced by the accumulation of earlier adverse life experiences and negative exposures. This life event will be embodied and carried with the child as they complete primary school and experience a second transition into secondary school.

3.4.2 Primary to secondary transition

In England and Wales, transition from primary to secondary school almost universally occurs at age 11, while children may have already turned 12 when transitioning in Scotland and Northern Ireland. In the USA, young people may transition from elementary to middle school at age 11 and then to high school at age 14, or go straight from elementary to high school at age 14 - and other countries may differ further, for example, in Portugal, transition to middle school occurs at age 9 (Coelho et al. 2018). Some research suggests that earlier school transitions are more problematic for young people (Bagnall et al. 2021).

When a young person transitions from primary to secondary school (or equivalent transition), there is a shift in role and status. From being one of the oldest students in a primary school, they move to being one of the youngest in a, generally, much larger secondary. The school setting, friendships and relationships with teachers change and can leave some students feeling

unsupported and unconnected (Waters et al, 2014). While school transition is viewed as a threat for some young people, causing greater stress and deflecting their trajectory; for others, it is a challenge that provides opportunities for growth (Sirsch 2003; Benner 2011). Research suggests that the primary to secondary school transition will be problematic for around 30% of children (Waters et al. 2014). Risk factors for transition having a negative impact on mental health sit at each ecological level: at the individual-level risk factors include current child mental health, child neurodevelopmental disorders such as autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD) and peer isolation; at family, friend and classroom-level risk factors include experiences of losing and forming friendships, teacher-student relationship changes and quality of school provision; and at the higher school culture and structure-level, risks include ethnicity, social class and differences in culture of organisations (Tilleczek and Ferguson 2007).

The majority of research on the impacts of primary to secondary school transition on young people can be divided into three broad categories, academic outcomes, social outcomes and emotional outcomes, with each impacted by environmental-level constructs, individual-level constructs and contextual factors (Evans et al. 2018). Academic performance and mental wellbeing are also closely connected to each other: poor mental wellbeing will have a negative impact on academic outcomes; struggling academically is likely to have a negative impact on mental wellbeing. A review of differences between children's and teachers' perceptions of transition found that while children's main concerns were socio-emotional, including worries about bullying, teachers were focused on the academic implications of transition (Topping 2011).

A recent systematic review (Jindal-Snape et al, 2020), found 96 papers to assess the impact of primary to secondary school transition on educational and wellbeing factors. Fourteen papers looked at educational outcomes and while many stated that the educational impact of transition was not negative for all students, none found a positive effect overall. Most studies (n=10) found a decrease in grades in at least one academic subject across transition, and the authors conclude that the evidence is strong enough to posit a negative relationship between primary to secondary transition and educational outcomes. Findings for wellbeing were more

mixed. While seven studies found a negative impact on pupils' wellbeing across transition, four found positive effects, highlighting that for many young people transition to a new school is a time of excitement and new opportunities. However, even if the average trend is for positive mental health transition, there may be subpopulations of young people who experience transition less positively than the average. Self-esteem trajectories across transition suggest subpopulations of young people with particularly poor experiences, potentially due to experiencing a mismatch between their individual developmental needs and their new school environment (Seidman and French 2004). Other research has identified subgroups of young people who are more likely to experience social anxiety and depression following transition (Gazelle and Faldowski 2019).

A common theme however is that the young people most concerned about transition are also most likely to have poor transition, highlighting that "it is crucial that pupils view the move to secondary school in a positive manner" (Jindal-Snape et al. 2020, p.548). Worry about transition is likely to be in part a reflection of the child anticipating difficulties due to their backgrounds and therefore, as has been argued, reducing worry will involve schools providing an environment that can support the child's needs. Where positive expectations do not find a match in reality, self-esteem is likely to be negatively impacted (Jindal-Snape et al. 2020). In a study of young people transitioning from nine English primary schools, Rice et al. (2021) found that pre-transition concerns were positively correlated with pre-transition conduct and emotional problems as well as lower academic ability. Post-transition, these concerns were associated with higher levels of loneliness. Concerns about secondary school did generally decrease as the young people came to the end of year 7 (first year of secondary school), however, this decrease was significantly slower for girls.

Evans et al (2018) echo this finding stating that despite mixed findings for the impact of transition on mental wellbeing in general, a recurrent finding is that transition tends to be most problematic for young people who are worried about it. Higher concerns and social anxiety pre-transition is associated with lower school belonging and higher loneliness four months after transition (Nowland and Qualter 2020) and there is also a close relationship between perception of transition, cortisol levels and future mental health (Zandstra et al. 2015). The

perception of transition as either a threat or a positive challenge is likely to be associated with the psychosocial and flexible resources available to a child, which is dependent upon factors such as SES and SEN. Children whose cortisol levels were lowered following transition by an intervention to reduce stress were nearly 2.5 times less at risk of having depressive symptoms three months later (Lupien et al. 2013).

Peer and parent relationships are also important moderators of transition experience. (Waters et al, 2014). Reduced classmate support over transition may be associated with decreased self-esteem alongside increased depression (Wit et al. 2011) and maintaining the same best friend across transition is associated with better academic outcomes and lower conduct problems (Ng-Knight et al. 2018). Peer relationships can bring a sense of belonging and connectedness as well as helping to shape future social identities (Pratt and George 2005). Importantly, family factors influencing transition include the nature of parenting that the child receives, with consistent, responsive and engaged parenting important to how a child feels able to cope with transition (Jindal-Snape et al. 2020). Perceived parental autonomy support - i.e. support to develop self-regulation and independence - across the transition is associated with lower child depression and higher child self-esteem (Duineveld et al. 2017).

School environment is important for mental health both pre and post transition. Young people who experience high levels of belongingness in their final year of primary school have better mental health outcomes in secondary school (Vaz et al. 2014a), and those with more positive perceptions of school climate display more positive trajectories of self-concept and self-esteem across the Portuguese middle school transition (Coelho et al. 2020). Having supportive and caring teachers is also key to a positive transition experience (Jindal-Snape et al, 2020) and children with positive teacher relationships across transition have more positive emotions (Hagenauer et al. 2013). A qualitative systematic review of interventions to support the primary-secondary transition found that positive engagement with all stakeholders - pupils, parents and schools - was key to successful school to school transitions (van Rens et al, 2018), and this finding was echoed by UK research a year later (Bagnall et al. 2020)

Two groups of young people are singled out by Jindal-Snape et al (2020) as being at potentially greater risk of poor transitions - young people with special educational needs (SEN) and students from low SES backgrounds. Both SES and having SEN have already been argued to be important pathways to embodiment of inequalities due to their lower levels of psychosocial and flexible resources. Children with SEN may also not be given opportunities for agency within the school context (Karlsson 2019) and may be more likely to struggle with a strongly classified school culture that privileges academic achievement. There is evidence that young people with SEN may experience more bullying and less social support following the transition to secondary school and there may be negative impacts on self-esteem (Hughes et al. 2013). The type of educational need can also have a big impact on transition experiences. Children with general learning disabilities and intellectual disabilities have particularly negative transition experiences (McCoy et al. 2020) and therefore research needs to be consider the impact of different SEN on how mental health is impacted by the primary to secondary school transition and the different mechanisms at play. Notably, the transition strategies that may successfully reduce anxiety in typically developing children may not be effective for children with SEN, and may even lead to greater anxiety if they are perceived to be too challenging (Rice et al. 2021). It is therefore important that schools consider how mainstream environments can be made to work for children for a diverse range of backgrounds and needs. It can be easy for schools to solely focus on the dominant groups within their settings, for example, more affluent schools becoming most supportive of the health of children with higher SES while the health of lower SES children is overlooked (Moore and Littlecott 2015).

Moore et al. (2021) created four groups of possible feelings about transition: ‘neither worried nor looking forward to transition’; ‘worried only’; ‘looking forward only’; and ‘looking forward and worried’. Interestingly, although young people from low SES backgrounds were no more likely to be in the ‘worried only’ group than those with greater affluence, they were less likely to be ‘looking forward only’ and more likely to be experiencing mixed feelings of looking forward to transition at the same time as worrying. Furthermore, relative position in the socio-economic hierarchy can be predictive of mental wellbeing. Children who drop down the school SES hierarchy in the transition process have poorer mental health than

those who rise up the hierarchy, i.e. movement from a low SES primary school to a more affluent secondary school is associated with poorer mental health outcomes than other transition combinations (Moore et al. 2020).

There may also be disadvantages in the types of secondary schools available to children from low SES backgrounds. At school-level, primary schools with a higher proportion of pupils eligible for free school meals send their pupils to a much wider range of secondary schools. These secondary schools tend to have lower academic achievement and higher levels of FSM pupils than those attended by students transitioning from more affluence primary schools (Burgess et al. 2008). Hence, students from low SES backgrounds do not have equal opportunities to attend 'good' schools and their experiences of transition are likely to be different to pupils with higher SES. As the authors highlight, "…there are systematic differences in the flows of poor and non-poor pupils between [primary schools] and [secondary schools], and flows are such that poor students appear to be (further) disadvantaged." (p.402). Therefore the school environment to which poorer pupils transition into is not necessarily equal to that transitioned into by more affluent students. This links back to the earlier discussion on fundamental cause theory - families with greater flexible resources can move into catchment areas for 'good' schools, while less affluent families are priced out of the same move.

Evangelou et al. (2008) suggest that a successful primary to secondary school transition can be assessed by five indicators. Two of these indicators are less likely to be achieved by children from low SES backgrounds: they are less likely to settle so well in school life that they caused no concerns to their parents; and they are less likely to get used to new routines and school organisation with great ease. These two indicators suggest difficulties in connecting to their new school environment and developing a sense of belonging.

If students do not connect to their school and build a positive academic trajectory, they are less likely to experience transitions between school and further or higher education.

3.4.3 School to university transition

Having completed secondary school, many young people will then go on to experience an educational transition from school to further or higher education. However, demonstrating the cumulative impacts of exposures over the life course, young people who have previously experienced poor educational transitions and failed to connect with their primary and secondary schools would be expected to be less likely to transition to university: “At each transition, prior labels and prior experience further narrow the pathways and available supports ahead” (Alvidrez and Weinstein 1993, p.19). There is also a concern that when young people from low SES backgrounds do transition to university they are more likely than more affluent peers to transition to low status courses in low status universities (Campbell et al. 2019a). Yet removal of these courses may simply result in fewer young people from poorer families accessing university in any form.

Transition to university often marks the first time a young person leaves home and has to build a life for themselves that is separate from their family, as well as having to negotiate new academic expectations, increased autonomy and responsibility, and build new friendships. While primary to secondary transition coincides with puberty, the transition to university coincides (in most cases) with the transition to adulthood (Montgomery and Côté 2003). The prefrontal cortex doesn’t typically reach maturity until a person reaches their mid-20s, and is important for executive functioning, which allows planning and coordination of actions as well as self-control (Blakemore 2018). Access to university for young people from less affluent backgrounds has grown over recent decades in the UK - 26.6% of students eligible for free school meals progressed to university in 2019/20 - however, this statistic remains lower than that for children not eligible for free school meals, and in 2019/20, the gap between both groups grew for the first time since 2005/6 (Department for Education 2021).

A meta-analysis found that, on average, nearly a third (30.6%) of university students experienced depression at any one time, much higher than the general population (Ibrahim et al. 2013). In the UK, Macaskill (2013), in a cross-sectional survey of one UK university, found that overall psychiatric difficulties peaking at

23.1% during the second year of university, with anxiety more prevalent than depression across all years. Andrews and Wilding (2004) found that both anxiety and depression increased on transition to university. Nine percent of students without depression or anxiety symptoms prior to the start of university developed mild or significant depression symptoms after transition; 20% developed mild or significant anxiety symptoms. In both US (Conley et al. 2020) and UK (Bewick et al. 2010) samples, mental health was shown to worsen following transition to university and to have still not returned to pre-university levels by the final year of university study. Poor mental health is also associated with failure to graduate. WHO data from 21 countries suggest that prevalence of mental health disorders is higher in young people who drop out of university compared to those who do not, perhaps unsurprising due to the relationship between mental illness and severe role impairment (Alonso et al. 2018).

However, despite the trend for mental health to decrease following transition in many students, this trend may have begun prior to entry to university: 83.1% of university students who reported having had a mental disorders during the previous 12 months stated that onset was prior to transition (Auerbach et al. 2016). It has been suggested that better mental health diagnosis and support problems during the teenage years may be resulting in more young people with mental health problems accessing university than have in the past, leading to a trend of increasing mental health problems among students (Cleary et al. 2011). However, other factors are also likely to be at play, including increasing numbers of students from low-income backgrounds attending university, resulting in a larger proportion of students who are likely to experience financial pressures (Macaskill 2013). Research suggests that financial difficulties may be a key moderator of mental health for university students (Andrews and Wilding 2004).

Student social relationships are important for a good university transition. Low social support is an important predictor of depression and poor quality of life in university students (Alsubaie et al. 2019) and the relationship between positive and negative social exchanges and emotional wellbeing across the university transition may be mediated by changes in feelings of loneliness (Fiori and Consedine 2013).

Notably, while research on transitions into school and from primary to secondary frequently highlight the important role of parents, parents are often absent from discussions about transition to university (Agliata and Renk 2008). Universities often discourage parental involvement in student matters, with ‘helicopter parenting’ being disparaged, and young people encouraged to fend for themselves (Hunt 2008; Somers and Settle 2010). However, many young people, and particularly those with mental health problems, still rely heavily on their parents for emotional, financial and practical support at university (Boughton et al. 2021).

The transition to university poses particular hurdles for poorer students. They are more likely to experience financial difficulties, competing priorities for their time (often linked to needing to have a job alongside their studies), unclear expectations of university, low confidence, lower academic preparedness and less family support than more affluent students (Devlin and McKay 2014). These factors can make transition more stressful. Experiencing chronic stressors in the first year of university is associated with poorer mental health outcomes, and chronic stressors are more common among first-generation students (Kroshus et al. 2021). A Norwegian study found that students with financial vulnerabilities had almost twice the risk of low academic self-efficacy, and students with low academic self-efficacy were four times as likely to have severe mental health problems (Grotan et al. 2019). Qualitative research also suggests a connection between low SES and mental health problems at university (Hyun 2017). Better mental health supports academic success too. Young people from low-income families with more positive social and emotional adjustment trajectories across the high school to university transition are more likely to graduation from university than those with less positive trajectories (Larose et al. 2019).

The transition to university can also pose a particular challenge for students with SEN. Qualitative research suggests that young people with autism anticipated finding the new social environment difficult to navigate, and were concerned about the practical demands of university living away from the scaffolding provided by family, as well as the changes academic expectations (Lambe et al. 2019). For young people with dyslexia, students expressed worries about how they would be perceived and lacked self-confidence about their ability to succeed

due to their diagnosis. They felt that there needed to be greater and more flexible support for dyslexic students than was typically offered, alongside greater acknowledgement by academic staff that different students learn in different ways (O'Byrne et al. 2019). These additional concerns from students with SEN are likely to increase the stress associated with transition.

Qualitative research has suggested that students would value universities equipping them better to cope with transition, helping them to develop a supportive network, fostering a more inclusive university culture and lengthening the transition period to incorporate secondary schools (Cage et al. 2021). More socially supportive university environments are associated with higher flourishing in students (Fink 2014). In terms of culture, Devlin and McKay (2014) argue that low income students frequently do not understand that there are unspoken requirements and tacit understandings involved in succeeding, and therefore are immediately at a disadvantage compared to more affluent peers. Thus, university environments have an important role to play in reducing stigma, supporting student mental health (Wynaden et al. 2014) as well as being more explicit about the hidden curriculum, encouraging agency in students and making the cultural environment more accessible to students from all backgrounds. Healthy students who feel more connected to their university have lower odds of developing depression and anxiety, and students already experiencing symptoms have higher odds of recovery (Adams et al. 2021),

3.5 Summary and conclusion

Educational transitions are a process that involves an interaction between student and school or university environment. Schools reproduce and perpetuate societal culture (Bourdieu 1990), often replicating middle-class values about the means and ends of education (Bernstein 1975). For young people from different cultural and socio-economic backgrounds where education is viewed in different terms, the school orders may be in direct conflict with young people's own cultural understandings and experiences. Ultimately, this may result in them being unable to fully engage with the school orders and become disconnected from the school environment (Bernstein, 1975). Children with SEN may also find transition more

problematic and be unable to fully commit to school orders that do not match their own educational, social and wellbeing needs. Schools therefore have a vital role to play in ensuring that their culture does not alienate pupils from diverse backgrounds, but instead, provides them with opportunity to find their place and experience a sense of belonging. If this does not begin at transition, when students first experience their new school, it may never happen, and this lack of engagement may have lifelong health impacts. In this sense, school transition is not just a transition between physical buildings, but can also pose a "socioeconomic transition" (Moore et al, 2020, p.5) that can only be eased if schools look critically at their practices and relationship with local families and community.

The next chapter will highlight the gaps in research that chapters two and three have uncovered, and pose the research questions that this thesis will seek to answer.

4. Identifying research questions

Transition between educational settings is a potentially stressful life event for young people. This thesis so far has argued that socioeconomic status, as a fundamental cause of health inequality, is a key pathway to mental health embodiment in young people transitioning between educational settings. It has argued that flexible and psychosocial resources can buffer the stresses of transition and that a weakly classified, highly meaningful school culture can reduce the stress associated with transition, reducing the burden on resources. Building on this argument, this chapter aims to summarise the key gaps identified by the literature review, and to propose a number of research questions that this thesis will seek to address.

The development of research questions is not an objective or linear process. A reflexive discussion of the subjectivities of the research process is presented in chapter five, however it should be highlighted here that the research questions are influenced by researcher interests as well as the interests of the university and research centre where the researcher is based. Research questions are also not developed in isolation of the methods needed to answer them - researcher preference for quantitative or qualitative methods will inform question development. Research questions requiring secondary analysis are also naturally limited and guided by the data available.

Therefore a researcher preference for quantitative methods alongside two identified datasets, plus the gaps in knowledge identified by the literature review, resulted in the following questions being developed.

4.1 Study 1: Latent class growth analysis (LCGA) of mental health trajectories

The first set of research questions come from the understanding that mental health trajectories are heterogeneous and it may be possible to group individuals based on their trajectories. Previous research has provided some evidence of subpopulations in mental health trajectories. Fanti and Henrich (2010), for example, in a sample of over 1000 children aged from 2-12 years from the USA,

identified five classes of externalising problems (chronic; high desister; moderate; moderate desister; and low) and three classes of internalising problems (high; moderate; and low). These different trajectories were differentially associated with a range of behaviours, including having deviant peer relationships and being rejected by peers.

Furthermore, as has been highlighted, mental health is a broad term that captures both negative and positive aspects associated with mental illness and mental wellbeing. Even mental illness can be broken down into parts, considering emotional, behavioural and social components, which may not be highly correlated. Therefore in considering how mental health changes over transition, it is important to consider multiple aspects of mental health, and also to consider how they might covary over time for different trajectories groupings, or 'classes'. For example, using growth mixture modelling (GMM), Shi and Ettekal (2021) identified four trajectory classes of internalising and externalising behaviours (each measured separately using different scales of the strengths and difficulties questionnaire) in children from the USA assessed from age 6-17: chronic co-occurring; moderate co-occurring; pure externalising; low risk. Children in the non-low risk categories were at high risk for poor educational outcomes following the transition to middle school, and children in the chronic co-occurring class had particular difficulties with teacher-child relationships. In a similar vein, using parallel process growth mixture model with four mental health outcomes, internalising problems, externalising problems, attention problems and social problems, McCoy et al. (2018) also extracted four classes (early recovery; late recovery; increasing attention and externalising problems; low and stable). Data were collected in the US during the pre-school year and then until children were in fifth grade. A four class model (non-depressed; mild depression; severe depression; despondent) for depression has also been found for adults (Mezuk and Kendler 2012).

A dataset was identified from the School Transition and Adjustment Research Study (STARS) which took place in 2012-13 (Rice et al. 2014). Students were followed from year 6 to year 7 and all transitioned to secondary schools in South East England. Child-report of the Strengths and Difficulties Questionnaire (SDQ), which includes subscales of different aspects of mental health functioning, was

collected at three time points, and alongside this, data on child characteristics, including gender, negative life events, special educational needs status, free school meal eligibility and whether the child was worried about school transition. Therefore the first analysis in this thesis will seek to better understand how the mental health problems assessed using the SDQ co-vary over the primary to secondary school time period, and whether there are subpopulations of young people with specific patterns of mental health that can be identified. It will then seek to assess whether the individual-level predictors of mental health across the primary to secondary school transition identified in previous research might influence trajectory class membership. This has not been investigated in an English sample of young people across the primary to secondary school transition.

There are two key research questions (RQ) for this analysis:

- RQ1: Among young people experiencing a primary to secondary school transition, are there subpopulations that can be identified based on their trajectories of mental health difficulties?

- RQ2: Do individual-level socioeconomic status, special educational needs, worrying about transition, experiencing multiple negative life events prior to transition and gender predict which trajectory class young people will be situated within?

4.2 Study 2: Multi-level modelling analysis of individual and school-level predictors

Building on the LCGA in chapter six, the second analysis will use a number of outcomes to obtain a fuller picture of mental health across the primary to secondary school transition. This analysis will be based on a second dataset created from two surveys collected in Welsh schools during 2019. The first survey, named ‘CHETS’ (Changes in child exposure to environmental tobacco smoke) collected data on year 6 students in Welsh primary schools prior to transition, and this was linked to a second survey as part of the School Health Research Network (SHRN) - which was carried out in secondary schools in

Welsh during the autumn term. Students in year 7 students who had also taken part in CHETS while in year 6 had their data linked. The Strengths and Difficulties Questionnaire (SDQ) used in chapter six will be used again, in three different ways. Firstly, it will provide an overall score of mental health difficulties, and then using the relevant subscales, a measure of emotional difficulties and a measure of conduct problems. Alongside this, a mental wellbeing measure, the Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS) will be used. These different outcome measures will enable testing of whether mental health problems and mental wellbeing have the same risk factors across transition.

These scales will first be used to consider individual-level predictors of mental health problems and mental wellbeing, including socioeconomic status, gender and being worried about transition. Notably and importantly, pre-transition mental health will be controlled for in the analysis so all individual-level predictors will be based on any changes in mental health that occur during the transition time frame. This analysis will also seek to understand how changes in family affluence might influence mental health over transition, building on evidence that individual affluence interacts with school affluence to inform young people's mental health outcomes (Moore and Littlecott 2015).

The analysis will then consider school-level characteristics - meaningfulness, classification and school-level affluence - to assess the effect they have on transition experiences. It is hypothesised that students in weakly classified and highly meaningful schools would have better mental health outcomes, as the cultures of these schools would be more easily connected to by students and students would find transition less stressful. A school environment survey was carried out in Welsh secondary schools alongside the child-reported SHRN dataset, and this teacher-reported data will be used to develop a measure of classification. Administrative data provided by Stats Wales will be used to develop a measure of meaningfulness. Both of these school-level variables will be used within the analysis. Neither measure has been considered within the context of primary to secondary school transition, or used to predict young people's mental health outcomes. This second analysis gives rise to two further broad research questions:

- RQ3: To what extent are socioeconomic status, gender, being worried about transition and pre-transition mental health important individual-level predictors of mental health difficulties and mental wellbeing following transition to secondary school?

- RQ4: After taking individual-level predictors into account, to what extent are school-level meaningfulness, classification and affluence important school-level predictors of mental health and mental wellbeing following transition to secondary school?

4.3 Study 3: Systematic review of school transition interventions

Finally, if, in line with ecosocial theory, the aim of epidemiological research is to have real-world impacts on health outcomes, knowledge about transition and the factors that influence mental health outcomes are not sufficient. There needs to be change in response to this knowledge, and in public health terms, this generally relates to interventions that can target these factors, which if successful might be developed into everyday practice.

While the first two analyses in this thesis are focused on primary to secondary school transition, this third analysis will include two other transition types, entry into school from a pre-school setting, and transition from school to post-compulsory education. The reason for inclusion of these two additional transitions is two-fold. Firstly, as has been argued in the literature review, the theoretical basis for SES as a pathway to embodiment over transition, and for school culture being an important predictor of the impact of transition on mental health is the same for all three transition types. Young people experiencing any educational transition may find it to be stressful and if so, will seek to use their available resources to respond to the stress. At all ages, young people from low SES backgrounds will typically have a lower resource pool of both psychosocial and flexible resources, and are more likely to experience cultural incongruence between their family environment and their new school environment. The hidden curriculum, privileging of middle-class priorities and the school orders are all likely

to be less similar to their home lives than they will be for children with higher affluence.

Secondly, transition interventions are typically complex to carry out as they involve following young people between two school settings and evaluation of these interventions is expensive as they need to resource follow ups over relatively long periods of time. Interventions frequently focus on each type of school as distinct intervention settings, resulting in less robust evaluation or systematic review literature on interventions which connect two or more through a focus on transition. This single setting focus is understandable due to the methodological complexity of longitudinal approaches that follow children between two settings. However it is also problematic because transition itself is an important milestone in child development which provides huge opportunities for both adaptive and maladaptive social and emotional development that may result in inequalities that persist across the life course (Gotlib and Blair 1997; Symonds 2015).

It is therefore possible that the number of transition interventions focused solely on mental health outcomes across the primary to secondary transition is insufficient for a useful analysis. As the other two transitions have a shared theoretical basis, there may be important learning from interventions aimed at these transition types that can support building an evidence base on primary to secondary transition interventions, while also offering comparative insights into how transition can be supported at different ages.

The final research questions will therefore seek to better understand the characteristics of interventions that have been used in the past to support a range of educational transitions as well as how effective they have been in supporting mental health. The analysis will consider the extent to which individual-level factors as well as school culture have been targeted through these interventions, and whether other possible mediators of transition experiences, including parenting, could support intervention effectiveness. It will also consider, in line with critical realism (see chapter five) which mechanisms the theories of change within these interventions draw on.

The two primary research questions for the final analysis are:

- RQ5: What are the characteristics of effective school transition interventions?

- RQ6: What are the theories of change that mental health transition interventions draw upon?

4.4 Summary and conclusion

Six overarching research questions have been developed based on the gaps in knowledge derived from the previous two chapters. These research questions will form the basis of analyses presented in chapters six to nine. Before these analyses, the next chapter will look at the methodological considerations of this research project by first arguing that critical realism is the most apt philosophical position for supporting the premises of ecosocial theory and then providing specific perspectives on the methodological choices of this thesis.

5. Methodology

The previous chapters have reviewed evidence on mental health outcomes across educational transitions and argued that ecosocial theory is a useful means of framing this. Six overarching research questions have been proposed and this chapter will consider the methods best placed to help answer these questions, while highlighting that the development of both research questions and methods was not a linear process, but "messy and iterative" (Micceri 1989, p.101).

First however, this chapter will situate this research methodologically within the critical realism research paradigm, and argue that it is closely aligned to ecosocial theory.

5.1 Research philosophy: Critical realism

Research paradigms, as defined by Kuhn (1962) are "the set of common beliefs and agreements shared between scientists about how problems should be understood and addressed" (p.45) and reflect "normal science" in a particular time period. In order to develop research questions and to select appropriate theory to support these research questions, it is therefore important to be explicit about which research paradigm the research will be set within.

Historically, paradigms within social science have ranged from the extremes of positivism to interpretivism. Yet, this thesis will argue that neither of these extremes is appropriate for epidemiological research. Positivism collapses ontology and epistemology together, suggesting that what we know is the same as what actually exists (Teddlie and Tashakkori 2009). It doesn't acknowledge the existence of non-empirical phenomena, nor, with its focus on closed systems and experimental designs does it have a response to the difficulties of isolating causal mechanisms within open social systems. It fails to acknowledge the importance of researcher position and values in scientific decisions and interpretations, and its emphasis on universal laws as a basis for generalisation is problematic for complex social contexts (Bryman 2008). Finally, it is highly reductionist, which in public health, results in biological factors being preferenced and social factors overlooked (Krieger 2011). Conversely, interpretivism, which allows little space

for generalisation, causal relationships or an objective ontology, results in public health problems having no hope of being addressed beyond an immediate context. It therefore undermines aims of progress in public health by ignoring the real effects of biological, social and physical mechanisms in the production of health (Nettleton 2013). It also cannot explain real world public health successes (Davey Smith and Ebrahim 2001).

Critical realism (CR) sits between the extremes of positivism and interpretivism; like positivism, it is ontologically realist; but like interpretivism it is epistemologically relativist. It has been described as the “pre-eminent post-positivist paradigm” (Bonell et al, 2018, p.11) and is a much better fit for the reality of epidemiological phenomena. Furthermore, ecosocial theory and critical realism offer complementary ontological and epistemological perspectives on the approach to public health research, and therefore can be used alongside each other.

5.1.1 Key concepts in critical realism and alignment to ecosocial theory

Critical realism holds that reality has existence that is independent of humans or other actors and is not dependent on human thought or perception (Okasha, 2002). In critical realism, reality is viewed as consisting of three layers. The ‘real’ is where causal properties or ‘mechanisms’ of social objects reside, much of which will be invisible (Letherby et al. 2013). Within the real sits the ‘actual’ which includes all events generated by mechanisms; within the actual is the ‘empirical’ which solely includes those events that can be observed or experienced (Zachariadis et al, 2013). The latter is purely epistemological - based on individual perception. Reality is therefore stratified into three layers, but it is also stratified due to emergence (Bhaskar 2017), with connections interacting across levels of reality (Alderson 2021). Emergence encapsulates the non-additive nature of many social phenomena - they are more than the sum of their parts - and is a strong argument against naïve reductionism, which overlooks the partial and situated nature of all human knowledge (Hodgson 2000). Even phenomena typically thought of in biological terms, such as evolution or mental health, can also be viewed as emergent, suggesting the need for emergent thinking in

biological as well as social science (Schwartz and Begley 2002; Jablonka and Lamb 2014).

Within a realist ontology, CR thus seeks to uncover objective truth - what would be obtained from a “God’s eye perspective” (Nagel, 2014, p.11) - but it does this from a position of epistemological relativism: our ability to know is limited by time, context and history. This relativism however has to reflect reality to a greater or lesser extent, as “interpretations that do not accord with that external reality will be refuted by experience” (Letherby et al. 2013, p.111). Bhaskar (2017) describes the ‘real’ world as intransitive - it is stable and independent of us. However, our perceptions of it are transitive, constantly changing and developing (Gorski, 2013). Epistemic fallacy occurs when statements about ontology are reduced to what we know and what we don’t know is overlooked (Bhaskar 2017).

This description of reality is a good fit for ecosocial theory. Ontologically, ecosocial theory is concerned with an objective reality of epidemiology, while acknowledging that data are not straightforwardly observed but involve interpretation and varying perceptions (Krieger 2011). Furthermore, Krieger (2011) is clear that the values of the researcher can have implications for how data are interpreted, but that while the researcher is constantly readjusting their perceptions of reality, reality stays constant and unchanging.

Alongside ontological realism and epistemological relativism, a third key concept in critical realism is judgemental rationality - Bhaskar (2017) describes these three concepts as the “holy trinity” of critical realism (p.20). Judgemental rationality states that despite the limits to our knowledge about the world, not all knowledge is equal and that it is possible to make rational decisions about which theories, given the evidence available, provide the most accurate depictions of the ‘real’ (Price et al, 2018). Closely linked to this is the idea that critical realism is ‘serious’ (Bhaskar 2017) - it is “deeply concerned” with policy change and takes the stance that “morality, human rights, justice, freedom and compassion” are ontologically real (Alderson 2021, p.119). Thus facts become value-laden: Bhaskar (2017) uses the example of witches - once you know that witches are not real, you have to acknowledge that burning people who have been labeled as witches is wrong. This is also an important tenet of ecosocial theory, in which

Krieger (2011, p.246) argues that some results are “more valid and beneficial” than others for improving health and that ultimately, epidemiology must seek to “create knowledge relevant to improving population health and preventing unnecessary suffering, including eliminating health inequities” (Krieger 2011, p.31).

Of central importance in public health research is critical realism’s approach to causality, which is based on mechanisms operating within the ‘real’. Discussions of causality within CR are not about empirical associations - i.e. observable correlations between variables - but instead focus on the mechanisms and structures operating beneath the empirical evidence. A mechanism is what is seen when the black box connecting two events is opened and “nuts and bolts, cogs and wheels” inside are observed (Elster 1989, p.3). Mechanisms provide an explanation of why two events are connected, and in identifying mechanisms, guide specification of statistical models and strengthen causal inferences (Hedstrom 2008). In this thesis, the two events of interest are school transition and mental health and while quantitative analysis can statistically connect these events, a focus on mechanisms asks how and why they are connected. This thesis argues that the differential distribution of resources is one of the mechanisms that explains the connection between these two events, particularly in the production of unequal outcomes across the population. The mechanistic paradigm shifts focus from relationships between variables to understanding the basis of these relationships (Dixon-Woods 2014).

These mechanisms are context dependent and explain why A does not always lead to B, particularly within the complex reality of the social world, and aims to elucidate the processes and conditions associated with the causal relationship (Zachariadis et al. 2013). These associations are known as ‘demi-regularities’ which indicate “the occasional, but less than universal actualization of a mechanism or tendency” (Lawson 1997, p.204). Causality and activation of mechanisms is therefore probabilistic, not deterministic, and these probabilities are nested within time and space. However, the social world contains sufficient invariance, alongside its stochastic properties, for context-dependent generalisations (Letherby et al. 2013). For example, smoking doesn’t always cause lung cancer, and not everyone with lung cancer will be smokers, yet, there

is a probabilistic connection between smoking and lung cancer which is sufficient to justify public health intervention (Alderson 2021).

In this research, the empirical level includes the measures used to assess mental health, socioeconomic status and other constructs, changing mental health measurements across the transition period and correlations between variables. At the actual are the young people, their schools, the transition process, mental distress, poverty, inequality and interventions. At the real are the mechanisms explaining why transition, inequality and mental health are correlated. These mechanisms will be multiple and will operate within and across all levels, involving political, economic, social and biological mechanisms, as well as mechanisms deriving from the agency of individuals. This thesis is theorising that a mechanism of differential resource distribution is key to understanding the mental health inequality associated with school transition.

There is also a central focus on causal mechanisms within ecosocial theory, many of which will not be visible, and time, place and historical contingency are viewed as key concepts that determine causal relationships. Mechanisms act within and across ecological and social levels. Ecosocial theory uses the concept of ‘structured chance’ to describe how while there is randomness within disease distribution, societal and ecological contexts, such as SES, can determine the probability of each health outcome and shift distributions in different directions by increasing exposure and risk. Therefore social structures and context alter the probabilities of different outcomes, in line with the concept of demi-regularities in critical realism, and individuals are also viewed as having agency to help further modify these probabilities (Krieger 2021).

Finally, critical realism is concerned with relatedness, and invokes the idea of the ‘four planes’ (Alderson 2021) which are closely connected to the ideas of ecosocial theory. The first is “bodies in relation to nature” which is aligned to the ecological focus of ecosocial theory; “interpersonal relations” aligns to the social aspects of ecosocial theory; “larger social relations and structures” to issues of levels, accountability and agency; and “inner human being in the mental-social-embodied personality” to embodiment. As in ecosocial theory, in critical realism,

power is invoked as an important mediator of health inequalities, visible as a continuous interaction between structure, agency and culture (Alderson 2021).

Critical realism therefore offers a complementary research paradigm for ecosocial theory, and together they suggest four important ideas that have been carried forward in this thesis. Firstly, that empirical findings which suggest pathways to embodiment are epistemological and not ontological, and therefore there should be a focus on uncovering hidden mechanisms residing in the 'real' level of reality and underlying mechanisms of action. Secondly, that context-mechanism interactions are key to mechanism action, and therefore it is important to consider which contexts (particularly in relation to time, level and place) might activate mechanisms and which might not. Thirdly, as both critical realism and ecosocial theory are aligned with moral realism, there should be an emphasis on developing policy recommendations that would help improve mental health outcomes and reduce mental health inequalities. And finally, findings should be considered in light of accountability, agency and power inequalities - who is responsible for health inequalities at each ecological and societal level, and what needs to change to address any imbalance?

5.1.2 Researcher accountability and subjectivity

In developing research questions and choosing the methods to address them, the researcher makes subjective decisions about what issues within their field of study are important and worthy of investigation. Researchers are thus accountable for how their research contributes to or helps reduce health inequalities (Krieger 2011).

In social science research, the researcher is intricately entwined with those being researched, sharing a common human identity with those being researched. In ecological terms, while a biologist or physicist is acting at a different level of scale to the topic of their research, which enables them to act as an external observer, a social scientist shares the same scale as their participants (Allen and Starr 2017). Subjectivity is built into the research process, and results in research being influenced by the researcher's own life experiences, perspectives and

values (Davis 2018), and is characterised by “politics, power and emotion” (Letherby et al. 2013, p.2) rather than the objectivity it is often portrayed to exhibit. Furthermore, the researcher is situated within a research paradigm that determines the activities of “normal science” (p.5), which seeks to force reality as perceived by the researcher into the boundaries determined by the paradigm (Kuhn 2012). When the paradigm shifts due to the accumulation of anomalies, the researcher sees the world in a new way: “What were ducks in the scientist’s world before the revolution are rabbits afterwards” (p.111-2). Thus, while the real stays the same, the researcher’s understanding and interpretation will always be epistemologically relative and historically situated.

Quantitative research, with its history in positivism, can be less comfortable with reflexivity, where the researcher’s apparent absence from research accounts provides false reassurance of objectivity. However, even given the same dataset and research questions, different quantitative researchers will likely make different decisions throughout the analysis process, resulting in different, and sometimes even opposing findings (Huntington-Klein et al. 2021). It is therefore important to consider, reflexively, how subjectivity and my own socially-situated identity, have influenced the research process (Davis 2018).

As a mother of two primary school-aged children, my interest in young people’s mental health began after the birth of my eldest child. Taking home a vulnerable new-born who I spent almost every minute of every day (and night) with, brought to the fore how her future outcomes, in particular emotional and psychological, were largely - at least this was how I felt - in my hands. Having experienced the mental health difficulties of people close to me, some of whom could trace roots back to childhood, I became convinced of the importance of early years experiences, and the role of parenting and environment, on future mental health outcomes. This led to my master’s dissertation on maternal mental health and parenting behaviours. As my children grew, my interest was not diminished, and joining DECIPHer, where there was a focus on school mental health, aligned with my interest in how environment might exacerbate or alleviate psychological distress. Closely tied to this remains an interest in how building positive aspects of mental health - mental wellbeing - can increase enjoyment of life alongside protecting against mental illness. This comes from a position that views social

and health inequality as socially unjust, requiring government intervention and being a legitimate area of research.

In joining a research centre, my interests became entangled with the priorities of the research centre. While academic knowledge was historically produced within a university setting focusing on experimental science with strict disciplinary separation, there has been a development of an alternative, more open approach, which has been referred to as ‘mode 2’ science (Nowotny et al. 2001). This new approach cannot be separated from the society in which it occurs, is associated with increasing numbers of sites of knowledge production - not just universities - and is focused on the applications of the knowledge produced, rather than knowledge for knowledge’s sake. In mode 2 science, society is now able to “speak back” to science (Nowotny et al. 2001, p.54), resulting in research priorities being steered by global and national entities, research being commercialised in order to obtain funding, and accountability for research outputs potentially changing researcher behaviour (Nowotny et al. 2003). Thus, the research centre in which I am based is faced with producing knowledge within this paradigm, with priorities influenced by the priorities of the wider university, funders, including Welsh Government, and the outcomes of the Research Excellence Framework (REF). Data collection for the secondary school SHRN dataset used in chapter eight was funded by Welsh Government, and the interest in transition has been increasing, both in Welsh Government and UKRI (for example, Welsh Government 2022b), and in researchers within my department (for example, Moore et al. 2020; Moore et al. 2021; Moore et al. 2022). The data available from CHETS and SHRN therefore lent themselves to quantitative analysis with a focus on school transition, and formed the initial idea for my thesis. From this, the idea of a systematic review with a focus on interventions - also a priority for the research centre - was developed. The research questions were developed iteratively based on the data available, the findings from my literature review, my own interests in both topic and methods. The research questions then themselves further helped develop the methods and literature review, providing an on-going feedback loop.

The research presented in this thesis is all based on secondary analysis. I therefore had distance from the participants in my research - I never met them -

and I didn't set the questions in the surveys used. However, someone else was responsible for the decisions about what to include and what to omit within the surveys, and therefore their subjectivities and priorities may be carried forward through my research. My own subjectivities and research interests were present however in selecting research questions, methods, developing statistical models and interpreting the findings. Even in my systematic review, where two reviewers were involved in most stages to provide some evidence of objectivity in decision-making (although the extent to which two researchers with similar backgrounds coming to the same conclusions represents true objectivity is arguably minimal), the ultimate interpretations and decisions about which data were important and how they should be represented were my own. The focus of this thesis on quantitative methods over qualitative methods should also be considered as due to subjective decision-making based on my personal preferences, the data available and the research interests of my research centre. It is also possible that my own biases have led to this research being conducted and reported in a way that has overlooked important areas of inequality, thus functioning to potentially widen rather than narrow, however mildly, mental health inequalities in young people transitioning between schools.

The methodological discussion that follows should be viewed in light of this subjective, situated, process of decision-making.

5.2 Methodological choice: multi-method quantitative using secondary data

In terms of methods, Bhaskar (2017) doesn't argue for any in particular: "there is no general method, there is only a specific method for specific objects given certain epistemological circumstances" (p.42).

The six research questions posited in the previous chapter were:

Study one: Trajectories of mental health across the primary to secondary transition and individual-level predictors of class membership (chapter six):

- RQ1: Among young people experiencing a primary to secondary school transition, are there subpopulations that can be identified based on their trajectories of mental health difficulties?

- RQ2: Do individual-level socioeconomic status, having special educational needs, worrying about transition, experiencing multiple negative life events prior to transition and gender predict which trajectory class young people will be situated within?

Study two: Individual and school environment level predictors of mental health and wellbeing across the primary to secondary transition using multi-level modelling (chapter eight):

- RQ3: To what extent are socioeconomic status, gender, being worried about transition and pre-transition mental health important individual-level predictors of mental health difficulties and mental wellbeing following transition to secondary school?

- RQ4: After taking individual-level predictors into account, to what extent are school-level meaningfulness, classification and affluence important school-level predictors of mental health and mental wellbeing following transition to secondary school?

Study three: Systematic review of universal interventions that target educational transitions (chapter nine):

- RQ5: What are the characteristics of effective school transition interventions?

- RQ6: What are the theories of change that mental health transition interventions draw upon?

The two broad classes of method available are quantitative and/or qualitative, each of which have different strengths and weaknesses. Quantitative research can provide representative data on a large sample of individuals in order to test

hypotheses (Silverman 2006). It can operationalise concepts and use validated measures to measure them and analyse them using statistical methods which can help uncover demi-regularities. Qualitative research, conversely, offers a different perspective by providing rich, deep understandings of social phenomena (Bryman 2008).

Research questions 1-4 sought to uncover relationships between variables, and have been addressed using a quantitative approach which makes use of large secondary datasets. This approach allows for generalising about associations between variables (at least within a probabilistic framework) in order to understand data trends and factors that influence outcomes. Research questions 5-6 also required a primarily quantitative approach to assess effectiveness of interventions, while also looking for qualitative differences in the interventions to help explain any findings.

5.2.1 Data collection strategy: secondary data

Both studies one and two used secondary survey data sets. The former was collected as part of the School Transition and Adjustment Research Study (STARS) in 2012-13 (Rice et al. 2014). Students were followed from year 6 to year 7 and all transitioned to secondary schools in South East England. Data were obtained directly from Professor Frances Rice who was lead investigator for the study, and is now at Cardiff University. This dataset set was chosen because it had three time points of data, which is the minimum necessary to assess growth trajectories as required in research question 1 (Berlin et al. 2014). Furthermore, by using two different datasets of young people transitioning from primary to secondary school for studies one and two, it enabled some comparison of findings to assess whether the same hypotheses held for individual-level variables in two different contexts.

The second dataset, used in study two, was created by linkage of two other datasets, from two surveys. The first was the CHETS (Childhood exposure to environmental tobacco smoke) survey which was a survey of year 6 students in Wales carried out in spring/summer 2019 and included questions on mental

wellbeing and school transition, and the second was the School Health Research Network (SHRN) survey of secondary school students, also in Wales, carried out in autumn 2019. Both surveys were carried out by DECIPHer at Cardiff University and data from students who participated in both surveys were manually linked. This dataset was chosen because the scope of the data enabled the development of a school-level classification measure, plus it could be further linked to administrative schools data to enable the development of a school-level meaningfulness measure. This was vital to ensure school-level variables could be included in the analysis to assess the impact of school environment on mental health outcomes across the primary to secondary transition.

A systematic review was carried out for study three, which is also a form of secondary analysis and enables researchers to "locate, appraise and synthesize the best available evidence relating to a specific research question in order to provide information and evidence-based answers" (Boland et al. 2017, p.2). This approach enabled data from a wide number of studies to be included in the analysis and for effectiveness of transition interventions to be assessed based on all available evidence. In order to obtain the data used within the systematic review, a search strategy and protocol detailing inclusion criteria, proposed data extraction categories and planned analysis was first developed. The protocol was registered in an external database (PROSPERO registration CRD42020176336) to reduce subjectivity during the review process (The PLoS Medicine Editors 2011). Searches were first saved and deduplicated in Endnote X9 before transferring to Rayyan, which is a systematic review specific programme and allows blinded screening of abstracts and full papers (Rayyan 2021). An excel spreadsheet was developed for data extraction that enabled multiple outcomes and multiple time frames of follow up to be extracted from the papers before analysis. More details on this process are in chapter nine.

Secondary data analysis has a number of important benefits - it often provides larger datasets than would be available from primary data collection, which may be more representative and have higher power to detect effects. It also avoids research being repeated and is more cost and time efficient (Tripathy 2013). The latter was particularly important in this research, where longitudinal data were required to assess changes in mental health outcomes over a prolonged period.

The data used for the first two studies relied heavily on self-report measures. Self-report measures were also frequently used in the systematic review. Thus individuals' experiences of transition were assessed based on their own assessments. Self-report measures are often criticised as lacking validity due to potential social desirability responding, and it is therefore important to justify their use in this research. Firstly, for mental health and wellbeing outcomes, self-report is arguably the most valid method of assessment given the "self-experiential nature" (Chan 2009, p.326) of the constructs. It is not possible to imagine anyone else being better placed to respond on behalf of the participant and part of the design process of these measures is to carefully word items to avoid there being a clear 'socially desirable' response. Secondly all of the mental health and wellbeing measures used in this study have been tested for measurement invariance and construct validity in large samples (for example, Van Roy et al. 2008; Deighton et al. 2013; Patalay et al. 2014; Ortuño-Sierra et al. 2015; Melendez-Torres et al. 2019).

Other measures may also be prone to social desirability reporting - for example, the Family Affluence Scale used in study two, however, that too has been tested for validity (Boyce et al. 2006; Torsheim et al. 2016) and there is evidence that when answers are verifiable, as they are in this measure, respondents are more like to respond accurately (Becker and Colquitt 1992). In fact, an evidence-based review of possible validity issues in self-report measures (Chan, 2009) is clear that "there is no strong evidence to lead us to conclude that self-report data are inherently flawed or that their use will impede our ability to meaningfully interpret correlations or other parameter estimates obtained from the data" (p.330). For some variables, multi-informant responses can be of use, particularly where, for example, child behaviour may be different in different settings (e.g. home vs school) (De Los Reyes et al. 2013) and in this thesis, this is exemplified by their use in many of the interventions included in the systematic review. Receiving similar responses about the same construct of interest from multiple informants, for example child mental health, provides triangulation and can help support conclusions.

5.2.2 Data analysis strategy: multi-method quantitative

The two secondary datasets used for studies one and two were longitudinal, hierarchical datasets. As highlighted in chapter two, ecological systems are divided into levels for analysis, even if in reality, those levels are more continuous and less discrete than convention allows (Allen and Starr 2017). In these two datasets, children are nested within secondary schools, although there will also be non-nested hierarchies based on power relationships. For hierarchical nested data, there are two main approaches to quantitative analysis - multilevel modelling (MLM) and structural equation modelling (SEM) (Curran 2003; Grimm et al. 2017).

Study one (chapter six) used latent class growth analysis (LCGA), which is based on a SEM analysis framework. It is a powerful technique for modelling longitudinal trajectories, and models intercepts and slopes as latent variables to be modelled across time for a single population (Wickrama et al. 2016). It is also then possible for a series of latent classes to be added into the model (in this thesis from two to five), in order to test for subpopulations within the overall population. This analysis involved three time points of data collection, one in year 6 (pre-transition) and two in year 7 (post-transition), with all collection points approximately six months apart. Three time points is the minimum required for growth curve analysis (Berlin et al. 2014). Unlike multilevel approaches to longitudinal growth modelling, LCGA provides model fit statistics (for example, RMSEA; CFI; SRMR) that can be used to assess relative fit of the models, and ultimately to select which model should be selected for further analysis. It also, unlike MLM, allows the straightforward modelling of latent classes and parallel processes, the latter of which was particularly important in this research, as four parallel processes were modelled over the three time points (CenterStat 2017). Data were cleaned using STATA (version 15.1), and then transferred into Mplus version 8.6 for analysis. Mplus is a programme specifically designed for latent variable modelling (Frey 2008).

Study two (chapter eight) used MLM. It is an extension of regression analysis which enables hierarchical data to be analysed by partialing out the variability in an outcome between individual and structural components (Cockerham 2005). In

this case, individuals were at the lowest level, and secondary schools at the higher level. Ignoring higher-level nesting results in an incorrect assumption that cases are independent, which artificially inflates the overall sample size, erroneously narrowing confidence intervals around regression coefficients (Steele 2008). Multilevel models have been used extensively to model hierarchical social data, and there are conditions under which findings are equivalent to structural equation approaches (Curran 2003). They have also been used effectively within public health (Diez-Roux 2000). In this analysis it was necessary to compare a three level with a two level structure (adding a primary school level) as an initial step in the analysis, and modelling higher order nesting is more straightforward in MLM compared to SEM (CenterStat 2017). Study two used linked primary and secondary school data to enable pre-transition scores for mental health and wellbeing to be controlled for in subsequent analysis (two time points of data were collected - one in year 6 and one in year 7). Furthermore, by modelling a higher level, school-level variables - free school meal eligibility (%), meaningfulness and classification - could be used as predictors of individual-level outcomes. STATA (version 15.1) was used to analyse these data. It is a statistical programme with broad capabilities and is well suited to data cleaning as well as analysis (Frey 2008).

Systematic review data can be analysed in a number of ways. A meta-analysis (Field and Gillett 2010) is typically advocated as the preferred analysis in health-related systematic reviews, but not all reviews will be amenable to this level of statistical manipulation. The Cochrane Handbook (Higgins et al. 2021a) lists acceptable types of analysis for intervention reviews based on available data, one of which is a direction of effect analysis, which only requires data on effect direction. It is appropriate where different effect measures are reported, there is incomplete reporting of effect measures and there is methodological diversity in the studies included (Higgins et al. 2021a). Effect direction analysis produces effect direction plots based on vote counting, rather than statistical significance, and can combine effects into different categories based on similarities, thus is flexible to complex interventions that occur in open systems (Boon and Thomson 2021). For these reasons, study three used effect direction plots to represent the findings of a large number of diverse transition studies. This approach is also useful within the context of critical realism as the open systems inevitable in

complex social interventions frequently result in mixed findings, making production of an overall effect size inappropriate (Bonell et al. 2018).

5.2.3 The limits of quantitative research

While a quantitative methodology is the most appropriate for the research questions posed, its use raises important considerations from within a critical realism paradigm which should be further explored.

Firstly, as variables and their correlations exist at the empirical rather than real level, uncovering hidden mechanisms is not directly possible using purely quantitative methods. In fact, quantitative research suggests a flat, rather than three level ontology, overlooking the social and cultural construction that creates health, as well as deeper mechanisms at work (Silverman 2006). This reduction in the complexity of reality is even more pronounced because the phenomena in this research are necessarily being researched within open systems where there will be multiple mechanisms operating within multiple contexts, rather than just one mechanism as would be isolated in a closed system. The reality will thus inevitably be complex, with mechanisms operating and interacting across different ontological levels (Bhaskar 2017). Statistical relationships within this thesis should therefore be viewed as a starting point for further understanding of which mechanisms might be at play within the transition process and the context in which they are activated - on their own, they are unable to predict whether similar trends will be seen in other settings, times or with other populations (Bonell et al. 2018).

Statistical models are the means by empirical data are organised, summarised and simplified within quantitative research. Yet, as has been argued by Elliott (1999), models should be viewed as stories rather than true representations of data - or as Box (1979, p.201) stated: “All models are wrong, but some are useful”. The stories represented by models are necessary to enable any meaningful interpretation of the data (Xie 2011) but they form just one possible interpretation. Not only this, but the process of developing statistical models involves choices based on “intuition, hunches and ideas” (Greiffenhagen et al.

2011). As will be discussed later in this thesis, the LCGA models in study one had to assume zero within class variation in order for the models to run successfully, which was helpful for producing acceptable models, but is unlikely to correspond to real life. Therefore while statistical models remain useful and important, they are also subjective and approximate - in making this point, Micceri (1989) compares the normal curve to a 'unicorn and other improbable creatures' given its lack of appearance in nature.

Alongside consideration of the use of statistical models is how p-values are used in this research. P-values are human-defined cut offs, that privilege some findings and cause others to be overlooked, even though sometimes it is the small number of contradictory cases that might have most theoretical interest (Lakew 2017). This privileging of p-values is argued to reflect human need to "reduce these data to the measure of the human mind" (Arendt 1958, p.267) even though this may lead to erroneous conclusions. P-values can therefore be used mechanically in statistics overlooking the importance of consideration and judgement. Gigerenzer and Marewski (2015) view p-values as a "surrogate" (p.434) - along with citations and publishing in high impact factor journals - for innovative research, shifting focus away from innovation and towards a more clearly defined, but less valuable outcome. They also argue that this focus frequently results in lack of reproducibility, a factor that has led some researchers to argue that p-value cut off values should be reduced to 0.005 (Benjamin et al. 2018). Yet, rather than focusing on p-values operating at the empirical level of reality, and considering them to reflect reality, critical realism argues for a focus on the real, with consideration of mechanisms and context.

P-values were used in the multi-level modelling analysis, although it was noted where findings were in the expected direction and therefore p-values in this sense as used as continuous rather than binary measures (Wasserstein et al. 2019). The LCGAs focused on odds ratios and confidence intervals, alongside p-values, which provide more information about the nature of a relationship than p-values alone. For the systematic review, p-values were not relied upon at all, and there was a focus on the direction of effect, whether significant or not, in order to produce effect direction plots. This is arguably a strength of the systematic review

- that by not focusing on p-values it seeks to use all available evidence, acknowledging that some studies will be under powered.

In systematic reviews, a focus on theories of change can help shift emphasis from a flat ontology that only reports empirical findings to the level of the real (Bonell et al. 2018). A theory of change states how an intervention is hypothesised to have its desired outcome by considering not just whether the intervention works, but in which context it works and for whom (Reinholz and Andrews 2020). Directions of effect, as are presented in this thesis, should be viewed as probabilistic demi-regularities that are context-dependent, and interventions as likely requiring modification to be transferred in to other settings (Bonell et al. 2018). Furthermore, while reviews of intervention studies have historically been associated with positivism through their aggregation of data from multiple studies (Gough et al. 2012), in reality, trials within social science implicitly align to critical realism through the use of randomisation. If context didn't influence mechanisms, there would be no need to randomise because outcomes would be the same irrespective of contextual factors. Thus randomisation is an acknowledgement of the reality of trials within open systems. The systematic review will seek therefore to consider underlying theories of change.

Secondly, it is also important to acknowledge that quantitative research can tend to focus on deterministic variables and structures as being responsible for outcomes, overlooking agency of individuals (Alderson 2021). While external events can change people's behaviour and have a positive or negative impact on their mental health, individuals also have some power to respond to these events and make changes that will themselves influence their mental health outcomes (Neff and Olsen 2007). Therefore the dynamic and reciprocal nature of cause and effect can be difficult to capture within a quantitative approach, and there can be a focus on the majority or 'average' experience, rather than minority experiences which might represent important examples of how individual agency as a causal mechanism can subvert structural constraints. As has already been highlighted, young people transitioning to a new school may experience some agency over their experiences, however this is likely to be mediated by resources, which itself is closely associated with socioeconomic status. Therefore by controlling for variables that are linked to agency, quantitative analyses can, to some degree,

account for it while still acknowledging that each child is an individual and can make choices about their own lives, even as they are simultaneously constrained by structures of power and inequality.

Individuals are also intersectional - they have multiple identities and power acts across each of these identities resulting in socially structured exposures and experiences: “power relations of race, class, and gender, for example, are not discrete and mutually exclusive entities, but rather build on each other and work together” (Collins and Bilge 2020, p.2). This has implications for agency and the resources that individuals have to subvert structural powers. Yet, it is not always possible to account for these intersectional identities in quantitative research. In the LCGA analysis, while it was possible to partially model some interactions between predictor variables (Appendix 1), not all interactions could be modelled, and even if they could have been, this would still not mean that all of the intersectional identities of the students involved in the research had been represented. Intersectionality is being increasingly advocated as a tool for understanding and analysing health inequality (Bowleg 2021), however quantitative analysis is not always best placed to provide the nuance needed for this to be effective. Therefore adding voices to this research through qualitative research to better understand how agency is employed over the transition process, the cases where individuals do not follow the trends dictated by structure as well as how the power dynamics associated with intersectionality affect school transition would be beneficial.

Finally, and echoing the need to consider intersectional identities of young people, quantitative research cannot provide lived experiences of the transition process that might provide an opportunity to delve further into the mechanisms underlying the quantitative findings. Although critical realism does not advocate for any particular research method for most research activities, in order to uncover mechanisms, CR argues for retroduction which involves asking ‘what must the world be like for this to occur?’ by imagining possible mechanisms based on empirical phenomena and then iteratively selecting the most likely causal mechanism (Alderson 2021). As such, it is a non-linear process that moves back and forth between deep structures and empirical patterns in order to produce the most valid representation of the phenomena under study (Saether

1998). Therefore research methods have to be aligned to the research questions, but retroduction should be considered where there is scope to consider underlying mechanisms.

Retroduction can also help minimise the researcher's position and power within the research process. Price (2016) is clear that retroduction is not a practice that researchers should be undertaking in isolation, but should be an activity that invites the views of lay people, particularly when considering 'wicked problems' such as health inequality. It should not be expected that a single researcher, or even a group of researchers, can retroductively uncover hidden social mechanisms without equal input from the communities that are being impacted. Neither can a researcher step outside of themselves, or their research paradigm, to understand the perspectives and priorities of others without inviting them into the research process. Even careful reflexive thought cannot free a researcher from their subjectivity (Pillow 2003) or provide access to the ontological level of the real, and in reality, it is often those aspects of a researcher's position that are most hidden that would be most worthy of reflexivity (Probst 2015). Those being researched are less tightly entwined within the current mode of normal science, and therefore are in a position to see new possibilities, allowing researchers to "mine cultural resources across a whole spectrum of society to generate a new concept" (Price 2016, p.118). Introducing lay voices to the research process and in developing policy recommendations in particular, is therefore one potential way to try to uncover these hidden researcher subjectivities and reduce the risk of the researcher exacerbating inequalities. The possibility of using retroduction to build on the findings of this thesis will be further highlighted in chapter ten.

5.3 Time horizon: Longitudinal

All the data used across all six research questions were longitudinal. All data used included assessment of outcomes pre- and post-transition, and the systematic review included post-transition follow ups that ranged from immediate to intermediate and sustained. Due to school transition being a process, research into its effects should be longitudinal (Jindal-Snape 2016).

From a critical realist perspective, quantitative longitudinal research needs to be conscious of the gaps between data collection points and what might have occurred between them that is not accounted for in the data collection. While correlations might be found between earlier and later variables, the link between variables may provide little understanding of how or why they are related, and will not be able to elucidate possible events or mechanisms that have been activated when data collection was silent (Alderson 2021). This is also an issue at the empirical level: it is important that longitudinal data are collected frequently enough, at the most relevant points in time and over the right timescale to capture shifts in outcomes.

5.4 Ethical considerations

From a critical realist perspective, research must be mindful of its moral imperative to, at a minimum, do no harm. In order for research to meet this minimum standard, and ideally go beyond it to make positive contributions to outcomes, it must be conducted with integrity. For secondary analysis of survey data, there are three main ethical considerations: storage of data; maintaining anonymity of participants; and ensuring consent has been provided for data to be used for the secondary analysis (Tripathy 2013).

In this research, for both sets of data, consent was provided at the point of data collection for additional secondary analysis to be carried out. Maintaining anonymity of both individuals and schools was ensured by anonymised datasets being provided where both individuals and school names were replaced by ID numbers. When data needed to be linked from Welsh Government sources (which provided the school names) to the anonymised data for production of the meaningfulness scale in study two, the scale was generated independently and then passed to a third party who could link it to the anonymised dataset. Finally to ensure secure storage, data were held on the Cardiff University server and accessed from a laptop using a VPN and remote desktop (due to COVID-19 it was not possible to use university computers). The laptop was password encrypted. Ethical approval was obtained for secondary data analysis from Cardiff

University School of Social Sciences Research Ethics Committee (ref: SREC/3652).

Systematic reviews, while not requiring formal institutional ethical approval, also have ethical implications. The most central, and from which many of the others stem, is that they are often used to influence policy and clinical decisions as well as further research. It is therefore important that they are carried out with integrity (Wager and Wiffen 2011). The production of a protocol prior to the review starting can reduce bias in the process (The PLoS Medicine Editors 2011). In order to minimise bias from the systematic reviewer, it is recommended that two reviewers screen and extract data from each paper identified in the searches (Wager and Wiffen 2011), however as has already been noted, the extent to which two people from similar social and disciplinary backgrounds reaching the same conclusion provides evidence of objective truth is debatable. Both are likely to interpret the data through a similar lens and observe and overlook similar aspects of reality. In this review, it was not possible for two reviewers to extract all the data due to cost constraints, therefore a proportion of papers were extracted by the second reviewer independently and cross checked.

Bias can also be introduced at other stages of the review, many of them outside of the reviewer's control, including search bias (including database, citation, availability, language, country and familiarity biases) and publication bias (including funding, methodological, outcome and confirmatory biases) (Suri 2020). While it is not possible to exclude all bias from the review, it is important that any conclusions drawn in a systematic review are mindful of the limitations and caveats that such biases would introduce, and therefore the extent to which the review should be used to inform decision making. Furthermore, when reviewing papers for inclusion in the review and extracting data from them, it is important that the reviewer acknowledges and reflects upon what is reported and what is not reported as the information provided is "inevitably refracted through the subjective lens of the authors of individual studies" (Suri 2020, p.47). Any papers that dominate the findings of a review should be carefully considered, both due to the possibility of fraudulent findings and because there may be reasons that are not stated as to why its findings may differ from those of other studies (Wager and Wiffen 2011).

The final ethical issue of systematic reviews is that they often assume that the original papers from which they draw have themselves followed ethical principles. It has been proposed that papers should be assessed for ethical sufficiency during a systematic review, and where criteria are not met, excluded from the analysis (Vergnes et al. 2010). This is however likely to be impractical as papers rarely report ethical procedures in sufficient detail to make a judgement about their ethical standards, and for many historical and important studies where ethics would not stand up to modern scrutiny, it is impossible to pretend the knowledge they provide does not exist. One approach which ensures that gaps in the original papers are highlighted is for systematic reviews to follow guidelines for reporting so that at a minimum, all required information is included, and bias in narrative synthesis and other analyses minimised (Campbell et al. 2020).

Alderson (2021) argues that ethics is often reduced to a "weak set of rules about research procedures" (p.113) when in fact, a researcher's own ethical perspectives will also impact on their research, and in line with moral realism, have central importance to what is researched and why. In this research, there is a clear position that health and societal inequalities are wrong, that the mental health of children and young people should be a priority for research and policy, and that government has to bear the weight of tackling the structural issues that lead to poverty and inequality of outcome for young people.

5.5 Summary and conclusion

This chapter has drawn parallels between critical realism as a research paradigm and ecosocial theory as a causal theory of epidemiology. It has argued that ecosocial theory aligns with critical realism and therefore is an appropriate theory to use within a critical realist paradigm. It has then gone on to argue for a quantitative methodological approach using a range of statistical procedures in order to most logically address the research questions set. Finally, it has considered the ethical implications of this research project. The next chapter will look at the first empirical study in detail.

6. Study one: Trajectories of mental health across the primary to secondary transition and individual-level predictors of class membership

The previous chapter argued that critical realism offers a useful research paradigm for exploring mental health inequalities and that a quantitative research design is best suited for answering the six overarching research questions of this thesis. This chapter will seek to respond to the first two research questions using data from English primary and secondary schools to model mental health trajectories across the primary to secondary transition.

Mental health, as a complex construct, can be split into domains and each part analysed separately rather than just as part of a whole. As introduced in chapter two, at the highest level, it can be divided into mental illness and mental wellbeing, with the former focusing on the negative symptoms of poor mental health, and the latter on the positive aspects of mental functioning (Iasiello et al. 2020). Even within these categories, it is possible to focus on specific subdomains - for example, a systematic review of measures used to assess mental health in young people aged 12-25 years old included questions to assess cognitive, emotional and behavioural outcomes, quality of life, social relationships and vitality (Kwan and Rickwood 2015). Measures often assess more than one aspect of mental health by using subscales. The Child Outcomes Rating Scale (C/ORS) for example is divided into questions on personal wellbeing, interpersonal relationships, social relations and overall sense of wellbeing; while the Revised Child Anxiety and Depression Scale (RCADS) has six subscales focusing on the symptoms associated with different mental illnesses (Wolpert et al. 2015). The Strengths and Difficulties Questionnaire (SDQ) which is frequently used in non-clinical samples to measure mental health difficulties is comprised of four subscales: emotional difficulties, conduct problems, hyperactivity/inattention and peer problems, each of which assess a different aspect of mental health functioning (Goodman 1997). Poor mental health may be indicated by high scores on one or multiple scales with different combinations producing different symptoms. The different aspects of mental health may also influence each other, for example, risk of developing internalising problems may be increased by

experiencing externalising problems (Gilliom and Shaw 2004) and peer relationships may mediate some of this relationship (Brendgen et al. 2001). Externalising behaviour in childhood is also associated with hyperactivity traits in adolescence, but not vice versa (Kuja-Halkola et al. 2015). Therefore it can be helpful to consider these measures simultaneously but separately to provide a more complete picture of the mental health status of each young person and to allow a deeper understanding of the specific difficulties they are experiencing.

Individual mental health trajectories are heterogeneous and therefore looking for a single average trajectory in a population, based on one overall measure of mental health may obscure and ignore important differences between individuals. Methods that can group individuals into subpopulations based on their multiple trajectories of different aspects of mental health functioning may therefore provide a more useful and accurate picture of how mental health changes over time. As highlighted in chapter four, previous research has found a varying number of groups (or 'classes') for different mental health measures across adolescence (Fanti and Henrich 2010; McCoy et al. 2018; Papachristou and Flouri 2020; Shi and Ettekal 2021). Furthermore, based on evidence that there are individual-level variables that can help predict how mental health might be impacted by transition, it would be hypothesised that the same individual-level variables would predict class membership.

The two research questions that this study seeks to address are therefore:

- RQ1: Among young people experiencing a primary to secondary school transition, are there subpopulations that can be identified based on their trajectories of mental health difficulties?

- RQ2: Do individual-level socioeconomic status, having special educational needs, worrying about transition, experiencing multiple negative life events prior to transition and gender predict which trajectory class young people will be situated within?

6.1 Methods

This study uses latent class growth analysis (LCGA) to identify classes of individuals with similar trajectories across the primary to secondary school transition (Nagin 1999; Herle et al. 2020). LCGA is based on growth curve modelling, but assumes that individuals are from different subpopulations rather than one overall population. These different populations are not grouped based on individual characteristics like SES or gender, but based on the individual responses themselves, creating person-centred, rather than variable-centred classes (Jung and Wickrama 2008). The analysis therefore adds categorical latent class variables to the growth curve model so that individuals are assessed on their own heterogeneous trajectories and combined into classes based on those with similar trajectories. This allows modelling of between class differences. In an LCGA, within class variability is set to zero, making it a special case of a growth mixture model (GMM), where the latter also models within class variability (Wickrama et al. 2016). It was not possible to run GMMs in this analysis, due to convergence issues. This is not unusual due to the large number of parameters involved in this type of analysis, and often results in a restricted GMM - i.e. an LCGA - being the more parsimonious solution (Wickrama et al. 2016). The LCGAs in this analysis will use a parallel process model that allows four complementary but different measures of mental health (emotional problems, conduct problems, hyperactivity and peer problems) to be modelled simultaneously. It will then focus on individual-level factors to assess whether they can predict the trajectory class that each individual is situated within.

6.1.1 Sampling

The School Transition and Adjustment Research Study (STARS) was conducted by researchers at University College London during 2012-3. The sample consisted of young people transitioning from 150 primary schools to nine secondary schools in the South East of England. Data were collected from young people on three occasions - in year 6 (final year of primary school - May 2012) and at the beginning and end of year 7 (first year of secondary school). Data collections were conducted six months apart (Rice et al. 2014).

6.1.2 Measures

The child-report version of the Strengths and Difficulties Questionnaire (SDQ) (Goodman 1997) was administered at all three time points. It consists of four subscales, conduct problems, emotional problems, hyperactivity and peer problems, each with five questions scored on a scale of 0-2, where higher scores equate to higher difficulties. Where more than half of each subscale (three or more questions) had been completed, the average score was used. If fewer than three, the subscale was marked as missing (Youth in Mind 2016). Cronbach's alpha was calculated at each time point for each subscale. Emotional difficulties ranged from 0.72 to 0.74; conduct problems from 0.57 to 0.62; hyperactivity from 0.69 to 0.73; and peer problems from 0.56 to 0.59. These are within the range reported as acceptable by Goodman (2001). The four SDQ subscales (emotional difficulties, conduct problems, hyperactivity and peer problems) were modelled as four separate, but parallel, trajectories, or 'processes' (for example, Wu et al. 2010; McCoy et al. 2018).

Secondary schools provided demographic data on child gender (female = 1), eligibility for free school meals (eligible = 1) and first language (non-English = 1). For special educational needs, the original data were rated on an ordinal scale reflecting increasing severity: 0 = no SEN, 1 = school action, 2 = school action plus, 3 = statement of educational needs. Responses were dichotomised so that 0 = no SEN and 1 = SEN present. Data were also dichotomised for ethnicity into white and ethnic minority groups (ethnic minority = 1).

To assess level of stress, a negative life events scale was used. Pupils were asked at time 1 (T1; during year 6 of primary school) which of 19 negative life events (NLEs) they had experienced in the previous 12 months. These ranged from death of parent or sibling to doing badly at school, a close friend moving away or serious illness to the respondent. The full list of questions is available in the Appendix of Riglin et al. (2015). Pupils were dichotomised into two groups, 0 = having experienced fewer than two NLEs prior to transition; 1 = having experienced two or more NLEs prior to transition. Finally, young people were asked during year six (T1) whether they were worried about the transition to secondary school. Children who said they were somewhat, quite or very worried

about transition have been scored ‘1’; children who said they were not at all, or little worried, are scored ‘0’. The final sample size was 1861 participants. Data were cleaned in STATA (version 15.1) and then transferred to Mplus (version 8.6) for analysis.

6.1.3 Missing data

Data at T1 were collected from children via post, resulting in higher levels of missingness (62%) than at the other two time points (19% and 14% respectively) where data were collected in secondary school.

Missingness in data can be missing completely at random (MCAR), missing at random (MAR) and missing not at random (MNAR). MCAR means that the missingness is unrelated to either observed or unobserved data; MAR that missingness can be predicted by observed data but not by unobserved data and MNAR where missingness is predicted by unobserved data, potentially including social desirability reporting (Rubin 1987; de Leeuw and Hox 2008). It can be problematic to ascertain which is the cause of missingness, and often all three factors are at play. Both full information maximum likelihood (FIML), which is the default in Mplus, and multiple imputation (MI), can address MCAR and MAR patterns of missingness to provide unbiased, precise estimates (Rubin 1987; Cham et al. 2017). The main difference between the two methods is that FIML uses all available data for each case to find the most likely value of the missing data, while MI creates multiple datasets with different potential values of the missing value to capture uncertainty and these multiple datasets are then used to perform the analysis (Grace-Martin 2010). For many analyses, FIML and MI give equivalent results, although there are situations in which they each outperform each other (Lee and Shi 2021). However, MNAR, unless a model can be built to explain the missingness, is likely to result in biased estimates using both FIML and MI.

In this study, the biggest cause of missingness was failure of individuals to return their questionnaire at T1, primarily affecting the SDQ, negative life events and being worried about transition questions. Most students in the sample had demographic data on gender, free school meal eligibility, special educational

needs status, ethnicity and first language as this was provided directly by schools. For the majority of individuals, it is likely that failure to respond at T1 was due to lack of desire or ability to participate, and some of the factors influencing this may be the demographic variables collected: students who did not take part in T1 were more likely to be male, eligible for free school meals, to have special educational needs, to be from an ethnic minority and to not have English as a first language (Table 6.1) all of which relate to missingness as being MAR. However, it is also likely that some data are also MNAR, which cannot be accounted for in the analysis. Findings should be interpreted with this in mind.

	Characteristics of each subsample				
Subsample	Female	Eligible for FSM	Special Educational Needs	Ethnic minority	Non English first language
Missing SDQ data at T1	45.30% (0.50)	17.06% (0.38)	19.74% (0.40)	41.89% (0.49)	29.21% (0.45)
Not missing SDQ data at T1	49.30% (0.50)	13.46% (0.34)	15.73% (0.36)	37.79% (0.49)	28.14% (0.45)

Table 6.1: Missing data patterns for Time 1 in year 6 (final year primary school). Standard deviation in parentheses.

Both FIML and MI were used in this study to account for missing data. FIML is the default option in MPlus and was used for all analyses except for the three step procedure (see Methods section) because FIML is not available in Mplus for this analysis. For the three step procedure, MI was used.

6.1.4 Analysis

6.1.4.1 Measurement invariance

The analysis involved three stages, firstly testing for measurement invariance, secondly modelling the latent classes, and finally, the three-step procedure to test for relationships between individual characteristics and class membership. As data were only collected on three occasions, trajectories were modelled as linear processes (Berlin et al. 2014).

In order for change over time in the later models to be valid, it is necessary to assess whether the measures underlying the latent factors perform consistently over time. A series of models were run to assess measurement invariance in line with the recommendations of van de Schoot et al. (2012). Three consecutive models were tested: the first to assess configural invariance (factor loadings, intercepts, item variances and correlations free to differ over time, resulting in the only constant being the items associated with each factor). This 'null' model was used as a comparator for subsequent models. The second model assessed metric invariance in which equivalent loadings were fixed equal across time. Model 3 assessed strong invariance, in which equivalent loadings and intercepts were fixed equal across time.

6.1.4.2 Latent class growth analysis

As part of the measurement invariance testing, latent variables were created to represent the four subscales at each time point. This model was then added to in order to convert the strong invariance model to a second order linear growth model. This involved creating two more latent variables for each process, representing the intercept and slope of each growth curve. While it was possible to model individual growth curves using the higher order model, it was not possible to convert this to a mixture model with multiple classes due to the high computational load. Therefore, the model was adjusted to use a composite measure for each subscale to reduce the number of parameters needing to be estimated and increase parsimony (Wickrama et al. 2016).

The latent growth curves were extended to incorporate a latent class variable (Figure 6.1). LCGAs are a special case of growth mixture models where the intercept and slope variances within each class are fixed to zero, assuming no within class variance. First LCGAs with 2, 3, 4 and 5 classes and no covariates were run; then secondary school was added as a fixed factor, and finally, to 'tidy up' the models, residual variance of each composite variable was held equal over time. This is assumed to be the case in multi-level modelling in many programmes, but has to be specified in Mplus (Stride 2021). All LCGAs converged and their fit statistics were extracted.

Due to missing data at T1 on primary school of origin, it was not possible to adjust the analysis for clustering at primary school level without losing more than half of the data. It was also not possible to model data as two-level with secondary schools at the higher level due to the low number of secondary schools - at least 30 higher level units are necessary to allow for accurate adjustment of fit indices and standard errors (Muthen 2003b). Therefore secondary schools were modelled as dummy covariates within each model to adjust for clustering. Intra-class correlations (ICCs) measure how related data are within clusters compared to between clusters, with values of zero indicating that there is no correlation between responses within a cluster - i.e. that responses are not influenced by clustering (Killip et al. 2004). ICCs were calculated for the data at each time point based on secondary school as a higher level predictor and were very low, in line with previous estimates of school mental health outcomes (Shackleton et al. 2016). ICCs did not differ greatly between the first time point (when students were still in primary school) and the second and third, despite not having transitioned when the first round of data were collected. This suggests that there were already commonalities between students going to the same secondary schools prior to transitioning (Table 6.2). Secondary school was therefore modelled as a time-invariant covariate within the LCGAs.

To further develop the LCGAs, a series of growth mixture models were then run, firstly class-invariant (CI), which assume that variance is equal across each class and secondly, class-variant (CV) which allow variance to be freely estimated within each class. None of the CI or CV models converged without negative variances or correlations greater than one. To address these issues of model misspecification, a number of adjustments were made, including holding covariance between latent factors to zero and holding one or more non-significant slope variances to zero. However, none of the models converged and therefore the models retained were the original LCGAs (Figure 6.1).

	Time 1	Time 2	Time 3
Emotional difficulties	0.02	0.01	0.02
Conduct problems	0.00	0.00	0.02
Peer problems	0.01	0.01	0.01
Hyperactivity	0.02	0.01	0.02

Table 6.2: Intra-class correlations (ICCs) for each outcome variables at each time point

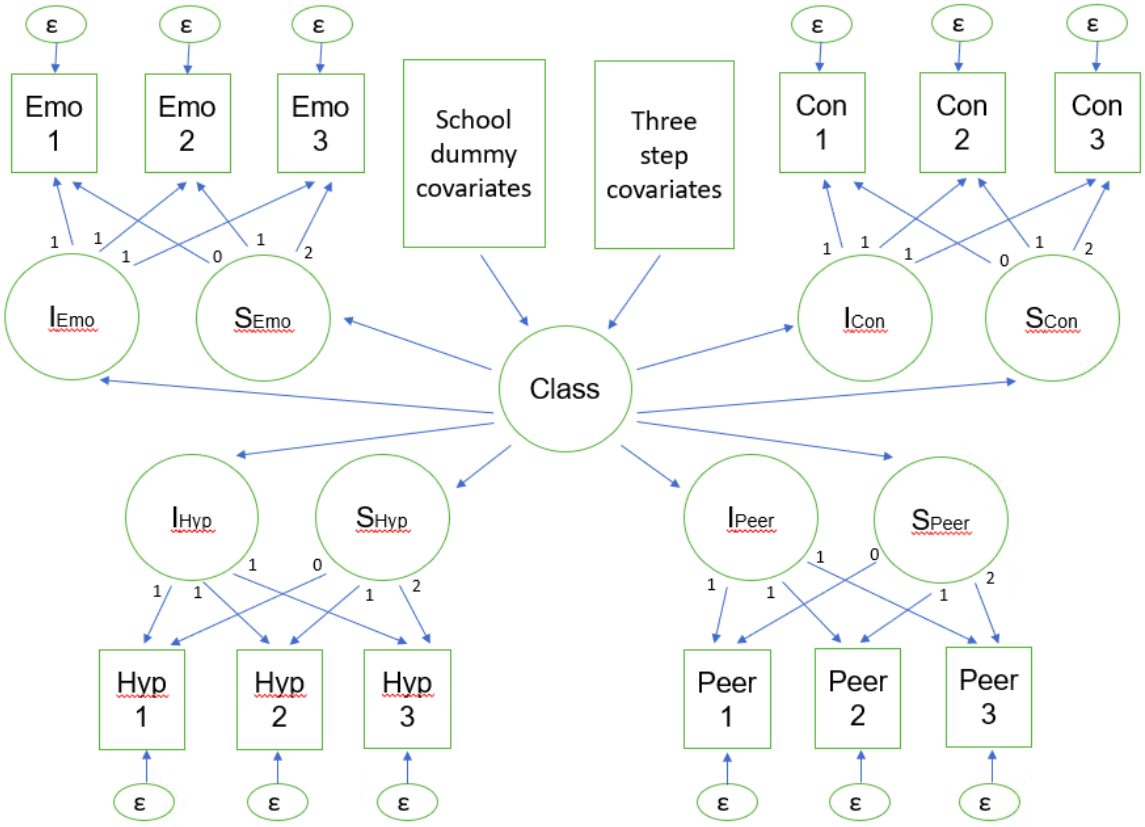

Figure 6.1: Latent class growth analysis diagram (I = intercept factor; S = slope factor for each dependent variable. Emo = emotional difficulties; Con = conduct problems; Hyp = hyperactivity; Peer = peer problems).

6.1.4.3 Three-step procedure

A multinomial logistic regression was carried out using the three-step procedure (Asparouhov and Muthén 2013). Steps were in line with Wickrama et al. (2016), with the only divergence being that due to missingness in some of the predictors,

multiple imputation was carried out in between the second and third steps (Muthen 2012). The three step procedure does not affect class development, but is based on the classes already developed during the LCGA.

Step one involves estimating and selecting the best model for the data, which had already been carried out. The second step involves re-running the selected model while requesting, based on class probabilities, a new variable that indicates which class each individual would belong to. This new variable is saved by Mplus as a new file along with the additional variables not used to create the model but needed for the subsequent analysis.

Multiple imputation was then used to impute values for gender, eligibility for free school meals, SEN status, being worried about transition and having two or more NLEs prior to transition. While the first three of these had relatively low levels of missingness as they were provided by secondary schools, the latter two were collected during the first round of data collection and had much higher rates of missingness.

The imputation model included these five variables along with two additional demographic variables that were theoretically determined to have potential predictive value: ethnicity (white or ethnic minority) and first language (English or non-English) (Samaan 2000; Spomer and Cowen 2001; Reis et al. 2009; Kouider et al. 2014; Jonsson et al. 2018). The secondary school ID variable and the dependent SDQ variables from each time point were also included in the predictive model to ensure that the connection between predictor and dependent variables was maintained during imputation (He 2010). Two hundred imputations were carried out to ensure accurate point estimates and standard errors. This has been suggested as a conservative estimate where data are sufficiently small to allow imputations to run quickly (von Hippel 2020).

The LCGA was re-run with class means fixed using logit values obtained during the original LCGA to ensure that class membership was protected when the covariates were added to the model. The five predictors were then regressed on class using multinomial regression to obtain log odds parameter coefficients (Wickrama et al. 2016). Odds ratios were then calculated as exponentials of the

log odds parameter estimates, and standard errors as exponentials of [log odds±1.96*SE(logOR)] (Mplus 2022).

6.2 Results

6.2.1 Descriptive analysis

Just under half of the sample were female (46.8%). One in seven participants were eligible for free school meals (15.4%) and one in six had special educational needs (18.0%). Approximately a third (32.9%) stated that they had experienced two or more negative life events prior to transition and a similar proportion were worried about transition while in their final year of primary school (35.4%). Tetrachoric correlations (Muthen 2003a) were calculated to represent correlations between pairs of binary variables, and were consistently low across all of the demographic variables. The highest correlations were between having SEN and being worried about transition (r=0.165), having SEN and having experienced two or more NLEs (r=0.162) and having SEN and being eligible for FSM (r=0.107) (Table 6.3). There were very low proportions of some of the combinations of variables, for example, just 4% of children were eligible for FSMs as well as having experienced two or more negative life events.

Table 6.4 provides descriptive statistics on the four dependent variables. Missingness was highest at T1, resulting in more adjustment to mean values following FIML. Each mental health difficulties subdomain was plotted based on these overall FIML averages, providing average growth curves estimates prior to the introduction of classes (Figure 6.2). Emotional problems rise slightly between T1 and T2 with little change between T2 and T3. Both conduct and peer problems increase between T1 and T2 before dropping between T2 and T3. Hyperactivity scores increase across all three time points. For each scale, the standard deviation is broadly comparable over time.

	Female	Eligible for FSM	SEN	Two or more NLEs	Worried about transition
Proportion of sample*	46.8%	15.4%	18.0%	32.9%	35.4%
Missingness (prior to MI)	1/1861 (0.05%)	262/1861 (14.08%)	263/1861 (14.13%)	1150/1861 (61.79%)	1148/1861 (61.69%)
Tetrachoric correlations					
Female	1.0				
Eligible for FSM	-0.00	1.0			
SEN	-0.08	0.11	1.0		
Two or more life events	-0.01	0.03	0.16	1.0	
Worried about transition	0.09	-0.05	0.17	0.09	1.0
Proportions (prior to MI)					
Eligible for FSM	114/1598 7.13%				
SEN	108/1597 6.76%	69/1598 4.32%			
Two or more life events	110/711 15.47%	28/662 4.23%	48/662 7.25%		
Worried about transition	137/713 19.21%	24/664 3.61%	51/664 7.68%	89/709 12.55%	

Table 6.3: Descriptive statistics for demographic characteristics. Tetrachoric correlations used for binary variables, ranging from -1 to +1. Multiple imputation used to address missingness (n=1861). NLEs = negatlve life events. *Based on average results over 200 datasets. Proportions calculated prior to multiple imputation as not possible post-imputation in Mplus

.

	T1 (Univariate)	T1 (FIML)	T2 (Univariate)	T2 (FIML)	T3 (Univariate)	T3 (FIML)
Emotional problems	2.09 (2.11) n=711	2.17	2.23 (2.26) n=1515	2.23	2.23 (2.27) n=1606	2.24
Conduct problems	1.38 (1.50) n=711	1.51	1.76 (1.77) n=1517	1.78	1.68 (1.73) n=1606	1.70
Hyperactivity	2.90 (2.23) n=710	3.09	3.17 (2.24) n=1500	3.20	3.223 (2.34) n=1605	3.24
Peer problems	1.51 (1.63) n=711	1.59	1.68 (1.73) n=1509	1.70	1.62 (1.70) n=1605	1.64

Table 6.4: Mean (standard deviation) values for each SDQ subscale at each data collection point. Univariate statistics are based on available data and do not account for missingness. FIML column provides mean values used in subsequent analysis having accounted for missingness (n=1861).

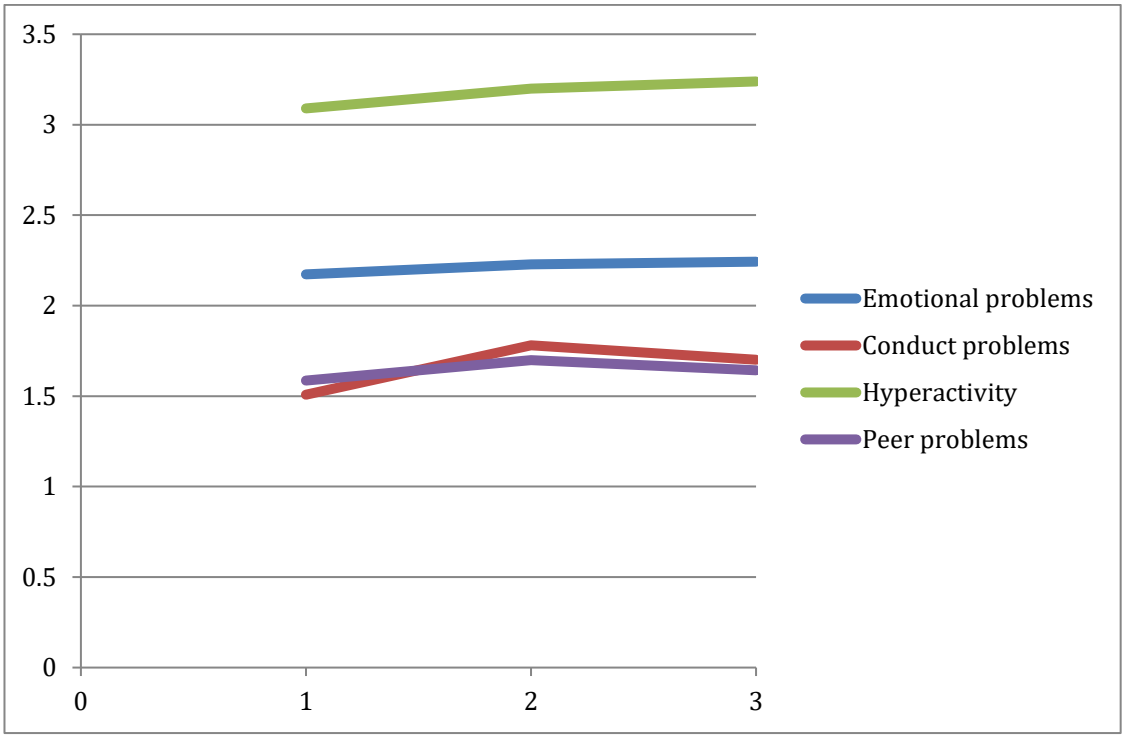

Figure 6.2: Mean trajectories of each dependent variable based on FIML estimations prior to introduction of a latent class variable. X-axis represents data collection points (T1-T3); y-axis represents mean values of each SDQ subscale.

Within each subscale, data collected across the three time points were moderately correlated (Table 6.5). The strongest correlations between subscales are at the same time points - i.e. emotional difficulties collected at T1 is more strongly correlated with peer problems at T1 than peer problems at T2 or T3. There is therefore little evidence that one subscale may be causing changes in other at a later date (e.g. there is no evidence that conduct problems at T1 is

more strongly related to emotional problems at T2 than T1). Some subscales are more strongly correlated than others. Emotional problems and peer problems are correlated at over 0.4 at each equivalent time point, and conduct problems and hyperactivity are correlated at over 0.5 at each equivalent time point. The weakest correlations are between hyperactivity and peer problems.

6.2.2 Measurement invariance

Table 6.6 provides the fit indices for the three measurement invariance models. Although the change in chi square is significant for the metric and strong invariance models (suggesting they are a significantly worse fit than the preceding model), where sample size is over 300, chi squared can result in reasonable models being rejected, and theoretically meaningless differences in models becoming statistically significant (Chen 2007; van de Schoot et al. 2012; Shi and Ettekal 2021). It is therefore recommended to use other fit indices. None of the fit indices change substantively across the increasingly restricted models, suggesting that all three models are of a similar fit. The root mean square error of approximation (RMSEA) and the standardised root mean square residual (SRMR) are absolute fit indices, which compare the fit of observed and expected covariance matrices using the maximum likelihood minimization function. Therefore lower values suggest less difference between observed and expected values. For RMSEA good model fit is indicated by values <0.6, which all three models have. For SRMR, good models are indicated by values of <0.08, again, met by all three models.

The comparative fit index (CFI) is an incremental fit indices that makes a comparison between the chi-square statistic for the model being tested and the chi-square statistic from the independence model. Acceptable cut offs for CFI are generally stated as being >0.9, which all three models fall short of here. However, it has been increasingly argued that fit statistic cut offs need to be based on the model being specified rather than set in stone based on simulations of different models in the past (Marsh et al. 2004; McNeish and Wolf 2021). Furthermore, simulations have suggested that many models do not achieve the 0.9 cut off and that values of 0.8 are more realistic in many cases (Baumgartner and Homburg

1996). The Bayesian information criterion (BIC) values, where lower BIC indicates a better trade off between model fit and model complexity, tends to decrease from model 1 to 3, suggesting that restricting some parameters is not negatively affecting the model, and that the assumption of measurement invariance is not unrealistic.

Emo T1	1.0											
Emo T2	0.54	1.0										
Emo T3	0.56	0.54	1.0									
Con T1	0.29	0.19	0.18	1.0								
Con T2	0.24	0.35	0.19	0.52	1.0							
Con T3	0.24	0.23	0.32	0.46	0.58	1.0						
Hyp T1	0.33	0.23	0.17	0.52	0.42	0.33	1.0					
Hyp T2	0.27	0.38	0.23	0.40	0.55	0.43	0.59	1.0				
Hyp T3	0.24	0.27	0.37	0.33	0.45	0.59	0.49	0.61	1.0			
Peer T1	0.46	0.29	0.27	0.34	0.24	0.21	0.28	0.16	0.17	1.0		
Peer T2	0.24	0.44	0.25	0.24	0.36	0.22	0.22	0.25	0.15	0.43	1.0	
Peer T3	0.25	0.30	0.42	0.20	0.25	0.30	0.21	0.22	0.24	0.42	0.47	1.0
	Emo T1	Emo T2	Emo T3	Con T1	Con T2	Con T3	Hyp T1	Hyp T2	Hyp T3	Peer T1	Peer T2	Peer T3

Table 6.5: Correlations between SDQ subscales at each data collection time point. Emo = emotional difficulties; Con = conduct problems; Hyp = hyperactivity; Peer = peer problems; T = time.

	Chi-sq, df	Change in Chi-sq, df	CFI	RMSEA	SRMR	BIC	Sample-size adjusted BIC
Configural invariance (null model)	3822.31, 1584	-	0.89	0.03	0.05	120413.49	119441.33
Metric invariance	3916.39, 1616	94.08, 32 (p<0.001)	0.88	0.03	0.05	120266.02	119395.52
Strong invariance	4099.34, 1648	182.95, 32 (p<0.001)	0.88	0.03	0.05	120207.42	119438.58

Table 6.6: Measurement invariance indices for each level of invariance testing. Fit indices include: CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual; BIC = Bayesian information criterion.

6.2.3 Latent class growth analysis (LCGA)

Table 6.7 presents the fit indices for three models, each with 2, 3, 4 and 5 classes. Model 1 is the LCGA without secondary school covariates, and therefore doesn't take into account variability at the school-level. Model 2 is the LCGA with the secondary school dummy covariates, and Model 3 includes the secondary school dummy covariates and also holds the variance of the observed composite variables equal over time.

The best fit for all classes (2, 3, 4 and 5) was model 3. Within model 3, entropy levels were over 0.8 for all models except the three class model. Entropy values are based on posterior probabilities. Values range from 0-1 where 0 indicates there is no class separation and 1 that there is perfect separation. A value of 0.8 or higher indicates high probability of class separation (Wickrama et al. 2016). The BLRT remained significant for all models, suggesting that each model was a significantly better fit than the one preceding it. The adjusted LMR-LRT was only significant for the two class model, although almost reached a significant p-value for the four class model. In all models class sizes were above 5% of the overall sample as advocated by Wickrama et al. (2016). As class number increased, BIC continued to decrease and didn't reach a low point, which is not untypical of LCGAs (Muthen 2009). Based on theory and examination of the graphs of each model, the four-class model was selected as the best fit to the data. It also had good latent class probabilities (Table 6.8) which provide the probability that an observation you have classified as being within a certain class is a member of that class, as well as other classes. High values within each class and low probabilities between classes, supporting clear distinction between the classes (Wickrama et al. 2016) and denotes high probabilities that observations have been allocated to the correct classes.

MODEL 1: LCGA - no covariates	2 Classes	3 Classes	4 Classes	5 Classes
LL (No of parameters)	-31000.36 (29)	-30638.07 (38)	-30284.66 (47)	-30124.16 (56)
BIC	62219.61	61562.94	60924.05	60670.98
Sample-size adj BIC	62127.47	61442.21	60774.74	60493.07
Entropy	0.84	0.79	0.81	0.82
Adj. LMR-LRT (p)	3033.95 (P<0.0001)	714.09 (p=0.30)	696.56 (p=0.11)	316.35 (p=0.61)
BLRT (p)	-32539.67 (p<0.0001)	-31000.36 (p<0.0001)	-30638.07 (p<0.0001)	-30284.66 (p<0.0001)
Class size (%) C1	510.49 (26.93%)	1134.09 (59.82%)	426.68 (22.50%)	982.37 (51.81%)
C2	1385.51 (73.08%)	508.39 (26.81%)	271.77 (14.33%)	123.53 (6.52%)
C3	-	253.53 (13.37%)	165.82 (8.75%)	445.84 (23.52%)
C4	-	-	1031.74 (54.42%)	106.31 (5.61%)
C5	-	-	-	237.96 (12.55%)

MODEL 2: LCGA - school dummy covariates	2 Classes	3 Classes	4 Classes	5 Classes
LL (No of parameters)	-30486.00 (37)	-30116.04 (54)	-29757.77 (71)	-29595.22 (88)
BIC	61250.56	60638.64	60050.10	59852.98
Sample-size adj BIC	61133.01	60467.09	59824.53	59573.41
Entropy	0.85	0.79	0.82	0.82
Adj. LMR-LRT (p)	3035.97 (p<0.0001)	734.17 (p=0.49)	710.98 (p=0.10)	322.59 (p=0.64)
BLRT (p)	-32015.84 (p<0.0001)	-30486.00 (p<0.0001)	-30116.04 (p<0.0001)	-29757.77 (p<0.0001)
Class size (%) C1	501.24 (26.93%)	1092.20 (58.69%)	269.60 (14.49%)	451.01 (24.24%)
C2	1359.76 (73.07%)	521.84 (28.04%)	427.43 (22.97%)	942.41 (50.64%)
C3	-	246.96 (13.27%)	164.61 (8.85%)	125.10 (6.72%)
C4	-	-	999.38 (53.70%)	239.42 (12.87%)
C5	-	-	-	103.07 (5.54%)

MODEL 3: LCGA - school dummy covariates. Variance of observed composite variables held equal over time	2 Classes	3 Classes	4 Classes	5 Classes
LL (No of parameters)	-30492.90 (29)	-30122.03 (46)	-29763.35 (63)	-29608.20 (80)
BIC	61204.14	60590.39	60001.02	59818.70
Sample-size adj BIC	61112.01	60444.25	59800.87	59564.55
Entropy	0.85	0.79	0.82	0.82
Adj. LMR-LRT (p)	3059.79 (p<0.0001)	735.99 (p=0.24)	711.81 (p=0.07)	307.90 (p=0.69)
BLRT (p)	-32034.75 (p<0.0001)	-30492.90 (p<0.0001)	-30122.03(p<0.0001)	-29763.35 (p<0.0001)
Class size (%) C1	1361.94 (73.18%)	248.33 (13.34%)	161.03 (8.65%)	950.59 (51.08%)
C2	499.06 (26.82%)	1100.19 (59.12%)	423.32 (22.75%)	100.35 (5.39%)
C3	-	512.48 (27.54%)	272.04 (14.62%)	239.45 (12.87%)
C4	-	-	1004.62 (53.98%)	445.37 (23.93%)
C5	-	-	-	125.24 (6.73%)

Table 6.7: LCGA fit indices for each model. Model 1 includes no school dummy covariates; model 2 includes secondary school dummy covariates; model 3 includes secondary school dummy covariates plus the variance of the observed composite variables is held equal over time. LL = log likelihood value; No of parameters = Number of estimated (freed) parameters; BIC = Bayesian information criteria; LMR-LRT = Lo-Mendell-Rubin Likelihood Ratio Test; BLRT = Bootstrap likelihood ratio test.

	Class 1	Class 2	Class 3	Class 4
Class 1	0.91	0.05	0.04	0.00
Class 2	0.03	0.85	0.04	0.09
Class 3	0.03	0.06	0.84	0.06
Class 4	0.00	0.05	0.02	0.93

Table 6.8: Average latent class probabilities for most likely latent class membership (row) by latent class (column). Values represent probability that an observation placed in each class (row) is actually a member of that or another class (column).

The four classes in the model are represented in Figure 6.3. The majority of students belonged to class 4 (54%), which can be described as 'low and stable' across all four subscales. Class 4 was used as the reference class in subsequent analyses. Twenty-three percent of students belonged to class 2, which is represented by individuals having low and decreasing levels of emotional and peer problems, but relatively higher levels of hyperactivity and conduct problems. Class 3 represented 14% of individuals, and consisted of individuals with high and increasing levels of emotional difficulties, moderately high and increasing hyperactivity, moderate, stable peer problems and low, stable levels of conduct problems. Finally class 1 (9% of students) was the smallest class and was characterised by individuals with persistently very high levels for all four subscales. Conduct problems increased significantly from time 1 to time 3 and hyperactivity and peer problems also showed an upward trend.

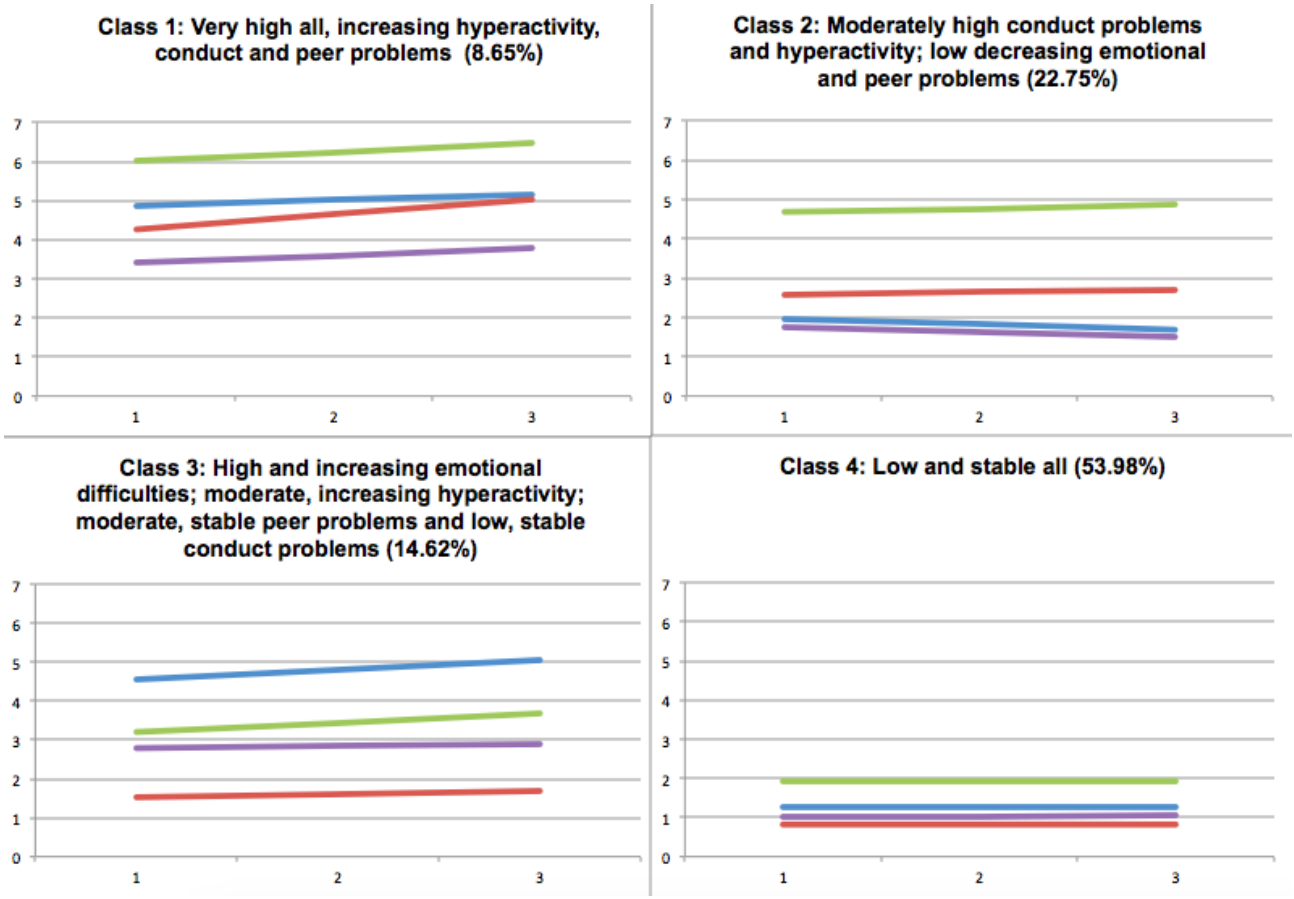

Figure 6.3: Class characteristics and percentage group membership. X-axis represents each data collection point (time 1-3); y-axis represents mean scores for each SDQ subscale within each class. Blue = emotional problems; red = conduct problems; green = hyperactivity; purple = peer problems

6.2.4 Three-step procedure

Odds ratios from the three-step procedure can be found in Table 6.9. Most of the odds ratios were significant and suggested that the five covariates were good predictors of which of the four classes individuals would belong to over the primary to secondary school transition. Class 4 was used as the reference group as it serves as a control of more favourable transition.

Adjusted for the other covariates, female students had significantly lower odds of being in class 1 with high scores for all variables than class 4, but had significantly higher odds of being in class 3 with high increasing emotional difficulties. For males, the converse was true. Students eligible for free school meals had higher odds of being in all three classes compared to reference class 4. They had over three times higher odds (odds ratio = 3.225) of being in class 1 (very high all); and nearly twice as high of being class 2 (moderately high conduct problems and hyperactivity) than in the reference class. They did not have significantly higher odds of being in class 3 (high, increasing emotional problems), although the effect was in the expected direction.

Students with special educational needs also had significantly higher odds of being in class 1 with very high scores across all subscale, and in class 2 with moderately high conduct problems and hyperactivity compared to reference class 4. The comparison between class 3 (high, increasing emotional problems) and class 4, while non-significant, was in the expected direction. Students who had experienced two or more NLEs also had higher odds of being in all classes compared to class 4. Finally, students who stated that they were worried about transition had higher odds of being in the two classes characterised by high emotional problems (classes 1 and 3) compared to the reference class.

	Class 1: Very high all, increasing hyperactivity, conduct and peer problems (8.65%)		Class 2: Moderately high conduct problems and hyperactivity; low decreasing emotional and peer problems (22.75%)		Class 3: High and increasing emotional difficulties; moderate, increasing hyperactivity; moderate, stable peer problems and low, stable conduct problems (14.62%)	
	Odds ratios	95% CI	Odds ratios	95% CI	Odds ratios	95% CI
Female	0.42	[0.27, 0.65]	0.32	[0.23, 0.45]	1.82	[1.24, 2.68]
Eligible for free school meals	3.23	[1.86, 5.61]	1.98	[1.27, 3.08]	1.27	[0.69, 2.35]
Special Educational Needs	2.90	[1.71, 4.92]	1.80	[1.17, 2.77]	1.63	[0.96, 2.74]
Experienced 2 or more NLEs	4.49	[2.27, 8.87]	2.10	[1.31, 3.36]	3.00	[1.80, 4.98]
Worried about secondary school	3.00	[1.57, 5.71]	1.17	[0.73, 1.87]	3.33	[2.00, 5.54]

Table 6.9: Multinomial logistic regression models with class as dependent variable and class 4 as reference. Odds ratios calculated for class membership given the other predictor variables. CI = confidence interval; NLEs = negative life events

6.3 Summary and conclusion

This analysis suggests that, in terms of mental health difficulties, there are four main subgroups of young people experiencing the transition to secondary school. The majority of young people were situated within the 'low and stable' grouping, however the large proportion of remaining students were in classes represented by poor mental health functioning in one or more areas. Individual-level characteristics predicted membership of trajectory classes, in line with evidence that young people from low SES backgrounds and those with special educational needs are more likely to have more negative trajectories of mental health difficulties through transition to secondary school than those without. Young people who are worried about transition were also more likely to have more negative emotional trajectories. These findings will be discussed in depth in chapter ten.

The next two chapters will seek to build on these findings by considering how school environment, alongside individual-level variables might influence mental health across the primary to secondary transition. Chapter seven will describe the development of two school-level measures, the first to assess school classification, and the second to assess school meaningfulness. Chapter eight will use these variables, alongside a number of individual-level predictors to assess whether improving these aspects of the school environment might reduce the impact of transition to secondary school on young people's mental health.

7. Developing measures of the school environment

The previous chapter considered how individual-level factors might influence mental health outcomes across transition. School-level factors may also be predictors of mental health functioning over the transition period, and may also be more effective targets for intervention than individual factors. This is for a number of reasons. While individual factors may help to describe the majority of variance in mental health, many will not be amenable to intervention - for example, biological sex or ethnicity - and it is likely that differences attributed to individual level factors are actually due to an interaction between individual characteristics and environment. Targeting environment also does not rely on children choosing to participate in an intervention where the emphasis is on them to change their thoughts or behaviours. When the emphasis is on the individual to change, this is likely to increase inequalities as it is generally the children with most to gain (e.g those from low SES backgrounds or with SEN) that will find it hardest to fully engage (White et al. 2009).

This chapter describes the development of two measures of school environment - classification and meaningfulness - which will be used in study two as predictors in multi-level regression models seeking to explain mental health in year 7.

No measure of classification was available in the CHETS-SHRN secondary data and therefore a measure needed to be developed based on available data and theory. Bernstein (1975) suggests that the level of classification within a school can be assessed by the way an individual school operates, with a weakly classified school exhibiting “open” instructional and regulatory orders. For the former, this would mean heterogeneous teaching groups, an emphasis on ways of knowing, co-operative teaching roles, blurred subject boundaries, varied social groups for pupils and aspirations of the many raised. For the latter, it would mean celebration of participation and co-operation, blurred boundaries with community and family outside of the school and a range of opportunities for pupils to influence staff decisions. The only available scale to measure classification was developed by Shackleton et al. (2017). It focussed on seven domains of boundaries: staff authority and responsibility; teacher-student collaboration; teacher support for students; how student learning is organised; the nature of

discipline and pastoral care practices; activities, practices or policies around student development; and the extent to which school is linked to local community. Although the scale had limited reliability and the factor structure initially proposed was not supported by confirmatory factor analysis (CFA), the categories are an important indicator of the factors that might be relevant to measuring a school's level of classification.

Measures of value added education have been used as a proxy for school-level meaningfulness (Aveyard et al. 2004; Bonell et al. 2017). By predicting how each school would be expected to do in terms of both academic attainment and attendance based on the composition of its students, it is possible to assess the difference between actual and expected values of each school. This difference can be used as a measure of how much better or worse student outcomes are than the model predicts. Schools that are highly meaningful for their students are able to encourage participation and engagement at a higher level than a school with a similar demographic intake but lower meaningfulness. Schools that have low meaningfulness for students will struggle with pupil disengagement and behaviour resulting in poor attendance and attainment.

This value added measure has been used to explain why smoking uptake, early alcohol initiation, heavy alcohol consumption, illicit drug use, stealing, fighting and poor behaviour at school (Aveyard et al. 2004; Bisset et al. 2007; Markham et al. 2008; Tobler et al. 2011; Bonell et al. 2017) are lower in some schools than others, suggesting that students connected to the two school orders are less likely to reject valued school identities and seek affiliation with subcultures where deviant behaviour is more likely to be promoted (Markham et al. 2008; Markham 2015). While the measure has not been used to explain differences in mental health and wellbeing outcomes between schools, a similar logic applies - it would be hypothesised that young people more connected to the school orders will feel a greater sense of belonging and self-esteem, have more peer support within school and feel more able to seek support from teachers when stressed or worried, resulting in better mental health outcomes.

7.1 Methods

7.1.1 Classification measure

7.1.1.1 Sampling

The dataset available for secondary analysis consists of two surveys from the School Health Research Network (SHRN) at Cardiff University. A pupil survey (completed in autumn 2019) which was open to all maintained, mainstream secondary and middle schools in Wales and was completed by students aged 11-16 (years 7-11) and years 12-13 where a school had a sixth form, during the autumn term of 2019 (Page et al. 2021b). Overall, 94% (n=198) of schools participated, and from years 7-11, 119,388 students responded (77% response rate within these schools). There was an overall response rate of 72% (Page et al. 2021b). Where students in years 12-13 responded, their responses have also been included in the aggregate scores below. The schools were also sent a school environment questionnaire (SEQ) to be completed by one senior member of staff. This was completed in January-March 2020. Of the 210 schools invited to participate, three had physically separate sites and were asked to complete for each site. Seventy-eight percent of schools participated in the survey (n=167), with 126 completing it in full and 41 in part (School Health Research Network 2020).

Questions from both surveys were screened to assess whether they fit within the domains of classification and boundaries proposed by a number of authors (Bernstein 1975; Markham and Aveyard 2003; Markham 2015; Shackleton et al. 2017). Forty-eight variables were initially selected, which based on the number schools (n=198 for the pupil survey; n=167 for the SEQ), was too many for a factor analysis - Osborne (2014) suggests a starting point for an exploratory factor analysis should be 20 cases per variable, although other authors have suggested as few as five may be sufficient (Suhr 2006). Two variables were excluded, one due to low variability - nearly all schools answered in the same way - and one was excluded due to high levels of missingness. To further reduce the

overall number of variables, binary variables that were part of the same string of questions were, where possible, combined (see Table 7.1).

Variables from the pupil survey were aggregated for each school based on all available responses from students in years 7 to 13, which resulted in an average score for each school. Only one school had fewer than 100 responses (n=45 responses) and many schools had over 1000 responses. The mean number of pupil responses per school across the dataset was 640. In total 24 variables were included in the factor analysis (Table 7.1), and these were loosely divided into categories based on sub-categories of boundaries.

7.1.1.2 Statistical analyses

Exploratory factor analysis (EFA) was carried out to extract key questions that could be used to explore the latent construct of classification within these datasets. EFA is a method to reduce a large number of interrelated variables into a distinct factor structure to represent and measure a latent construct. Each factor will be represented by multiple variables, and the overall construct represented by one or more factors (Osborne 2014). The process doesn't impose a pre-defined structure on the data, but allows the data to develop the structure based on correlations between variables. This is in contrast to confirmatory factor analysis (CFA) in which the factor structure is first hypothesised and then tested using the data (Suhr 2006). The latter was inappropriate for this analysis as although there was some theoretical basis for the factor structure, it was not clear which variables would have the most predictive value and should be included in the each factor, nor whether there would be sufficient internal reliability to create a coherent measure from the data available.

Although there is no factor structure imposed on the data, an initial number of factors to be extracted must be stipulated or, in order to account for 100% of variance, the same number of factors as items will automatically be extracted (Osborne 2014). There are a number of indicators that can help in the decision of how many factors to extract (Howard 2016), however they are sometimes contradictory. A commonly used indicator is the Kaiser criterion based on eigenvalues, however this has been shown to be inaccurate and should be

avoided (Osborne 2014; Howard 2016). Recommended indicators include using theory alongside a scree plot and a Minimum Average Partial (MAP) test (Osborne 2014; Howard 2016). The scree plot is used to visualise the amount of variance in the data accounted for by each factor, in order of decreasing amounts of variance. The MAP test is also based on variance explained by factors, but is calculated using average squared correlations of the dataset. At each step, the variance of each factor is partialled out and the squared correlation recalculated until it reaches a minimum, suggesting the number of factors needed to explain the most variance (Howard 2016). Both of these methods, alongside theory were used to guide factor extraction.

Although there were only small amounts of missing data in the SEQs completed by schools, when the pupil data was aggregated and combined, there were 36 schools that had completed pupil data but not filled in the SEQ, leaving higher missing values for the SEQ variables. Variable 24: “Does your school have partnerships with any of the following individuals or groups to help improve student health and wellbeing?” had the fewest responses, with only 158 complete cases out of a possible 203. To account for the missing data, factor analysis was carried out with multiple imputation using a covariance matrix (Graham 2009; Weaver and Maxwell 2014). Unlike typical multiple imputation (see section 6.2.3 on missing data in chapter six), rather than creating multiple datasets with different imputed values, this method imputes initial missing values (the estimation step), and then processes the data using maximum likelihood estimation (MLE) to create mean and covariance estimates. These two stages are repeated until the estimates converge, creating a final covariance matrix based on all data. This process assumes that the data are missing at random (MAR) and that the data are multivariate normal (Truxillo 2005; UCLA: Statistical Consulting Group 2021). However where normality cannot be assumed, the second stage can also use iterative principle axis factoring (PAF), which follows a very similar two step process (McNeish 2017). The following analysis uses PAF as many of the variables in the EFA were not normally distributed, however, it was also replicated using MLE as recommended by Howard (2016), and both methods produced the same final factors. The analysis was also replicated without multiple imputation using listwise deletion, with the same factors extracted.

7.1.2 Meaningfulness

7.1.2.1 Sampling

Data were obtained from Stats Wales via the My Local School website which allows data to be used freely in any format with the acknowledgement that the public sector information is licensed under the Open Government Licence v3.0 (Welsh Government 2022c). Personal correspondence with Stats Wales also provided additional data on pupil gender.

As of January 2021, there were 205 state secondary schools in Wales according to the My Local School website. Of these, six had opened in the previous five years and so were yet to have any attainment data. The remaining 199 secondary schools were included in this analysis. Data were extracted on two outcome variables - attainment and attendance - and on five predictor variables: percentage of students eligible for free school meals (FSM); Welsh Index of Multiple Deprivation (WIMD); proportion of females; ethnicity; and proportion of children with special educational needs (SEN).

Attainment was measured using the capped 9 points score which is calculated for each student in year 11 (age 16) in Wales and consists of nine attainment ‘slots’ each worth one GCSE. Three slots are subject specific and contain the student’s best result in English or Welsh language or literature, mathematics or mathematics - numeracy, and science. The remaining six slots contain the best results obtained in any other GCSE subjects (Welsh Government 2019a). Stats Wales creates an aggregate measure for each school and this was used in the analysis. The calculation for producing the capped 9 points scale changed in 2019, making comparison with previous years problematic. Therefore, only data from 2019 were used in the analysis as it was not possible to create a five year average as in Bonell et al., (2017). It was not feasible to combine with 2020 or 2021 data due to the impact of the coronavirus pandemic on data availability and exam results. For attendance, the Welsh Government provides a percentage of half days attended by students across the school year. This was averaged for

2015-2019 to provide a five-year average for each secondary school. Achievement and attendance were positively correlated (r=0.736).

Individual-level predictor variables were selected based on their association with academic and attendance outcomes in the literature, as well as their potential association with mental health. Two measures of deprivation were used as predictors. Firstly, data on the proportion of young people eligible for free school meals (FSM) within each school were accessed via My Local School. Data from the 2017-2019 three-year average were used (mean = 16.61%; range = 4.1% to 50.8%). Secondly, each school's postcode was used to obtain the school's local super output area (LSOA) and from this, the Index of Multiple Deprivation (IMD) score for that LSOA from the 2019 IMD analysis which is available under the Open Government Licence v3.0. The IMD is the Welsh Government's official measure of relative deprivation. It ranks all LSOAs in Wales from 1 (most deprived) to 1909 (least deprived) and is calculated based on eight domains of deprivation - income, employment, health, education, access to services, housing, community safety and physical environment (Welsh Government 2019b). Each LSOA has an average population of approximately 1600 people (Welsh Government 2019b). In this analysis, IMD rankings ranged from 1-1900. There was a moderate negative correlation between school FSM eligibility and Welsh IMD (r=-0.478).

In January of every school year, a census is completed by all schools in Wales. The 2019 census data were used to calculate the percentage of females in each secondary school as well as percentage for each secondary school of students who recorded that their ethnic background was anything other than 'White-British'. Overall gender data for 179,165 students across the 199 schools was provided. Just under half of students in the sample were female (49.74%). The average aggregate score for female gender across the schools was slightly higher (49.86%). At the aggregate level, the average school proportion of ethnic minority students was 9.30% (range 0.8% - 84% at the school-level). Stats Wales also reports on the proportion of students within each secondary school that have been identified as having special educational needs, including School Action, School Action Plus and having a statement of SEN. These percentages were

summed for each school to give an overall proportion of children with SEN. Mean aggregate school values were 24.76% of students (range 6.6% to 65.1%).

7.1.2.2 Statistical analyses

Two linear regression models were created (Tobler et al. 2011), one with the capped points 9 score as an outcome, and the other with the attendance measure as an outcome. The full list of predictor variables (Welsh IMD, proportion of females, %FSM eligibility, % of children with SEN, % of ethnic minority pupils) were added as predictors to both models. Residuals from each model were stored and standardised (to give a mean value of 0 and standard deviation of 1). The residuals represent the difference between expected and actual scores for each school and outcome, given the school's demographic composition. A principle components analysis (PCA) was run for the residuals from the attendance and attainment models to examine their factor structure. Similar to an EFA, a PCA is a method for reducing complexity in datasets and reduces variables so that they sit on uncorrelated axes using vectors. PCA can be used for any number of variables, including assessing whether two variables can be represented by just one principle component (Holland 2019). A cut off of 70% of variance being explained is used to select the number of principle components retained (Jolliffe and Cadima 2016). Within this analysis, if both models were representing the same underlying construct, the PCA should suggest a factor structure of one which would allow the two sets of residuals to be summed and standardised to create the overall meaningfulness measure for each secondary school.

Boundary domains	Variable No	Variable Name	Question	Scoring	Survey of origin
DISCIPLINE - student/teacher boundaries			How often does your school use the following restorative practices in your approach to student discipline?		
	1	Dis_Circle	Circle time	1-4 (never - often)	Teacher
	2	Dis_Restorative	Restorative conference	1-4 (never - often)	Teacher
	3	Dis_Peer	Peer mediation	1-4 (never - often)	Teacher
	4	Dis_Other	Other	1-4 (never - often)	Teacher
STUDENT ENGAGEMENT - student/school boundaries			How frequently do you use the following methods to involve students in policy developments?		
	5	SEng_Council	Consultations with school council	1-6 (never - always)	Teacher
	6	SEng_Group	Consultations with other student voice groups	1-6 (never - always)	Teacher
	7	SEng_Wider	Wider consultations with students (e.g. surveys)	1-6 (never - always)	Teacher
	8	SEng_Box	Suggestion boxes	1-6 (never - always)	Teacher
	9	SEng_Other	Other methods	1-6 (never - always)	Teacher
	10	SEng_Policy	Sum of the 'yeses' to the following policy development questions	0-6 (0 to 7 stages)	Teacher

			At what stage [in policy development] are your students usually involved?		
			Proposing when a new policy is needed or an existing policy needs amending	Binary (yes/no)	
			Developing the content of a policy	Binary (yes/no)	
			Commenting on a draft policy	Binary (yes/no)	
			Implementing a policy	Binary (yes/no)	
			Writing a student-friendly version	Binary (yes/no)	
			Monitoring and/or reviewing a policy	Binary (yes/no)	
			Other	Binary (yes/no)	
	11	SEng_Meet	How many times a year does your School Council or similar student-led body meet?	1-3 (less than 6 times a year - more than 6 times a year).	Teacher
			Here are some statements about pupils in your school. Please show how much you agree or disagree with each one:		
	12	SEng_Activity	At our school, pupils have a say in planning and organising school activities and school events (project weeks or days, sport weeks or days, excursions, field trips etc	Aggregate score 1-5 (strongly disagree - strongly agree)	Pupil
	13	SEng_Project	At our school, pupils have a lot of chances to help decide and plan school projects	Aggregate score 1-5 (strongly disagree - strongly agree)	Pupil
	14	SEng_Pupil	At our school, pupils' ideas are treated seriously	Aggregate score 1-5 (strongly disagree - strongly agree)	Pupil
	15	SEng_Idea	At our school, my ideas are taken seriously	Aggregate score 1-5 (strongly	Pupil

				disagree - strongly agree)	
TEACHER SUPPORT - student/teacher boundaries			Here are some statements about teachers. Please show how much you agree or disagree with each one:		
	16	TSup_Care	I feel that my teachers care about me as a person	Aggregate score 1-5 (strongly disagree - strongly agree)	Pupil
	17	TSup_Talk	There is at least one teacher or other member of staff at this school who I can talk to about things that worry me	Aggregate score 1-5 (strongly disagree - strongly agree)	Pupil
PARENT ENGAGEMENT - parent/school boundaries	18	PEng_Area	Sum of the 'yeses' from the following parental involvement questions	0-4 (none to 4 areas)	Teacher
			In what areas are parents involved in decisions regarding health and wellbeing improvement at your school?		
			Identifying health priority areas	Binary (yes/no)	
			Health education	Binary (yes/no)	
			School health policy	Binary (yes/no)	
			Other	Binary (yes/no)	
	19	PEng_Way	Sum of the 'yeses' from the following parental involvement questions	0-6 (0 to 6 ways)	Teacher

			In what ways are parents involved in health and wellbeing improvement decisions?		
			PTA meeting	Binary (yes/no)	
			Surveys	Binary (yes/no)	
			Information evening for parents	Binary (yes/no)	
			As parent governors	Binary (yes/no)	
			Pressure from parents (i.e. contact initiated by parents on health issues)	Binary (yes/no)	
			Other	Binary (yes/no)	
	20	PEng_Outdoor	Sum of the 'yeses' from the outdoor sports facilities questions	0-3 different times of the week	Teacher
			Which of your school's facilities are available for groups in the local community to use and when?		
			Outdoor sports/play facilities - In the evenings	Binary (yes/no)	
			Outdoor sports/play facilities - At weekends	Binary (yes/no)	
			Outdoor sports/play facilities - In school holidays	Binary (yes/no)	
	21	PEng_Indoor	Sum of the 'yeses' from the indoor sports facilities questions	0-3 different times of the week	Teacher
			Which of your school's facilities are available for groups in the local community to use and when?		
			Indoor sports/play facilities - In the evenings	Binary (yes/no)	
			Indoor sports/play facilities - At weekends	Binary (yes/no)	

			Indoor sports/play facilities - In school holidays	Binary (yes/no)	
	22	PEng_Cater	Sum of the 'yeses' from the catering facilities questions	0-3 different times of the week	Teacher
			Which of your school's facilities are available for groups in the local community to use and when?		
			Catering/dining facilities - In the evenings	Binary (yes/no)	
			Catering/dining facilities - At weekends	Binary (yes/no)	
			Catering/dining facilities - In school holidays	Binary (yes/no)	
	23	PEng_Facility	Sum of the 'yeses' from the other types of facility questions	0-3 different times of the week	Teacher
			Which of your school's facilities are available for groups in the local community to use and when?		
			Other - In the evenings	Binary (yes/no)	
			Other - At weekends	Binary (yes/no)	
			Other - In school holidays	Binary (yes/no)	
	24	PEng_Partner	Does your school have partnerships with any of the following individuals or groups to help improve student health and wellbeing? Please tick all that apply	0-11 partnerships	Teacher

Table 7.1: Variables included in exploratory factor analysis. Shaded boxes indicate that these variables were used to create a combined variable and were not used as single variables

7.2 Results

7.2.1 Classification measure

7.2.1.1 Extraction of factors

A MAP test of all 24 variables suggested extracting four factors and the scree plot (Figure 7.1) suggested six. Figure 7.1 illustrates that the first factor explains nearly 50% of variance (eigenvalue of approximately 5), while the second factor explains over 25% of variance (eigenvalue of approximately 2.7), and therefore together account for around 75% of variance. There is a steeper decrease between factors six and seven within the plot, and this is used as a cut off for selecting the number of factors to extract. Theory also suggests the data may help to explain four classification domains (Table 7.1), however to be cautious and avoid missing any important indicators, factor analysis was initially run set to a maximum of six factors.

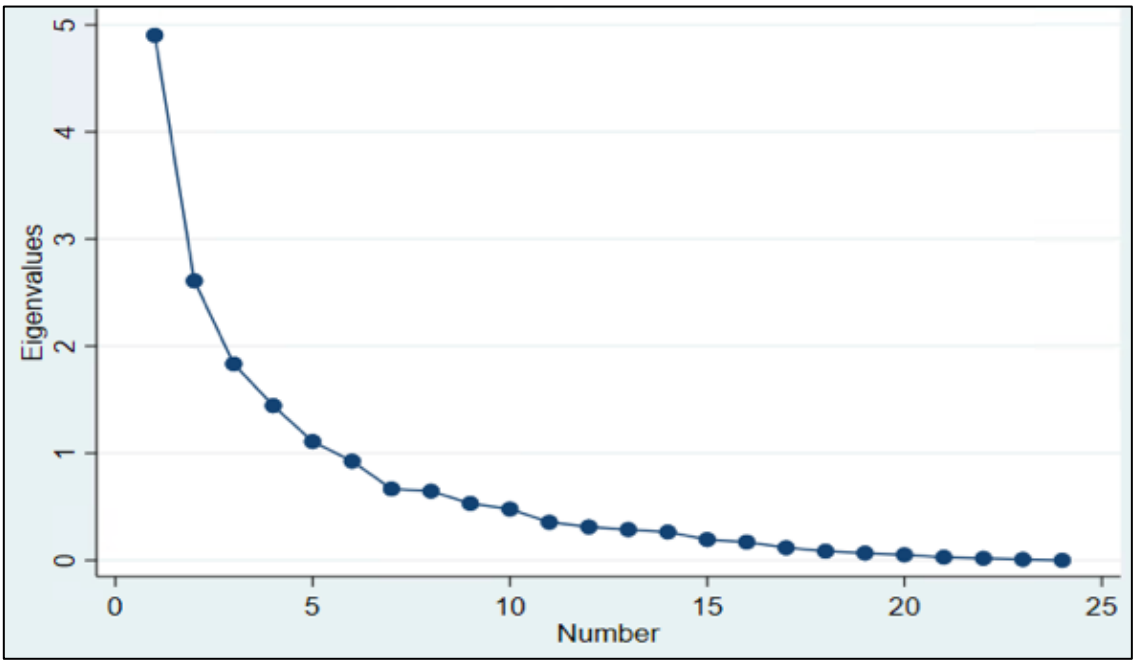

Figure 7.1: Scree plot of all variables selected for exploratory factor analysis (n=24 variables)

In EFA, a decision also has to be made about how factors will be rotated. This refers to the rotation of graph axes so that factors fall as close to the axes as possible and aids interpretation of the factor structure (Osborne 2015). The two

options are orthogonal rotation, which assumes the factors are uncorrelated, and oblique rotation which allows the factors to correlate, however, in the case that they are uncorrelated this will give the same results as orthogonal rotation. Oblique rotation is recommended for this reason and is provided by the promax algorithm in STATA (Osborne 2014; Osborne 2015). Four variables failed to load on any of the six factors at ≥0.3. These were removed and the factor analysis was run again, still set on a maximum of six factors (Table 7.2).

Variable	Variable Name	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Uniqueness
1	Dis_Circle					0.53		0.71
3	Dis_Peer					0.33		0.87
4	Dis_Other						0.53	0.71
5	SEng_Council		0.78					0.40
6	SEng_Group		0.82					0.30
7	SEng_Wider		0.71					0.45
9	SEng_Other				0.37			0.82
10	SEng_Policy		0.45					0.65
12	SEng_Activity	0.85						0.13
13	SEng_Project	0.92						0.05
14	SEng_Pupil	0.96						0.06
15	SEng_Idea	0.95						0.08
16	TSup_Care	0.77					0.45	0.28
17	TSup_Talk	0.77						0.39
18	PEng_Area				0.75			0.49
19	PEng_Way				0.63			0.58
20	PEng_Outdoor			0.73				0.48
21	PEng_Indoor			0.86				0.23
23	PEng_Facility			0.42				0.81
24	PEng_Partner					0.59		0.53

Table 7.2: Factor loadings following extraction of six factors from selected variables. All factor loadings shown are ≥0.30. Blank spaces represent loadings of <0.30

The factor analysis was then run two ways, firstly (iteration 1), by removing the crossing loading variable (variable 16) and secondly (iteration 2), by reducing the number of factors for extraction to four from the start of the EFA, based on the initial MAP test suggestion. Both iterations then proceeded by examining Cronbach's alpha and McDonald's omega correlation coefficients to assess internal reliability of each factor (Trizano-Hermosilla and Alvarado 2016), and

uniqueness scores within the models produced. McDonald's omega was calculated using the formula:
Omega = (sum of factor loadings)^2 / (sum of uniquenesses + (sum of factor loadings)^2) (Verkuilen 2012).

7.2.1.2 Iteration 1: removing cross loading variable 16

Variable 16 was removed from the EFA and the model re-run. This gave a clean solution across six factors, but overall for the 19 indicators, alpha = 0.32 which is unacceptably low. A generally accepted threshold for internal consistency based on alpha is 0.70, which indicates that 70% of the variance in the measure is 'true score' and 30% is due to error (Osborne 2014).

Based on unacceptably low internal reliability measurements, the EFA was re-run reducing the number of factors until the only factors remaining had alpha and omega values of over 0.70 (the excluded factors all had alpha values below 0.50). This resulted in a three-factor solution, although the overall alpha value for the whole scale remained very low (0.13). There was also evidence of model misspecification in factor three due to a negative uniqueness value (Kolenikov and Bollen 2012) and it only included two items (variables 20 and 21) which is lower than the minimum of three items per factor recommended to reliably ensure a convergent solution in confirmatory factor analysis (Marsh et al. 1998).

The model was therefore re-run for a final time dropping the two variables from factor 3 and reducing the factors extracted to two (Table 7.3). There remained an unacceptably low alpha when the variables consisting of factors 1 and 2 were combined (alpha = 0.39), suggesting that they do not form a coherent measure of 'classification', although separately (factor 1, alpha = 0.95; factor 2, alpha = 0.77), they may provide two useful measures. There is some evidence of redundancy in factor 1 (due to the very high alpha and very low uniqueness values of some of the indicators), and this will be addressed later in this chapter.

Variable	Variable Name	Factor 1	Factor 2	Uniqueness
5	SEng_Council		0.77	0.40
6	SEng_Group		0.79	0.36
7	SEng_Wider		0.74	0.46
10	SEng_Policy		0.49	0.76
12	SEng_Activity	0.92		0.16
13	SEng_Project	0.96		0.07
14	SEng_Pupil	0.98		0.06
15	SEng_Idea	0.95		0.10
17	TSup_Talk	0.67		0.56
Cronbach's alpha		*0.95*	*0.77*	
McDonald's omega		*0.95*	*0.80*	

Table 7.3: Factor loadings with extraction set to two factors (iteration 1). All factor loadings shown are ≥0.30.

7.2.1.3 Iteration 2: reducing initial extraction to four factors

The MAP test initially suggested four factors should be extracted from the analysis, so this second iteration started the EFA with just four factors for extraction, rather than six (again, using multiple imputation to account for missing values). This analysis did not create any cross loading (in contrast to iteration 1). The eight variables that failed to load on any factors at ≥0.30 were removed and the factor analysis was re-run. Neither factor 3 nor factor 4 had acceptable internal reliability, and therefore, as with iteration 1, a two-factor solution was run (Table 7.4). This solution is almost identical to iteration 1, except that it has retained variable 16 in factor 1.

Variable	Variable Name	Factor 1	Factor 2	Uniqueness
5	SEng_Council		0.77	0.40
6	SEng_Group		0.79	0.36
7	SEng_Wider		0.74	0.46
10	SEng_Policy		0.49	0.75
12	SEng_Activity	0.88		0.23
13	SEng_Project	0.93		0.13
14	SEng_Pupil	0.98		0.04
15	SEng_Idea	0.96		0.06
16	TSup_Care	0.72		0.49
17	TSup_Talk	0.68		0.55
Cronbach's alpha		*0.94*	*0.77*	
McDonald's omega		*0.95*	*0.80*	

Table 7.4: Factor loadings on two factors (iteration 2). All factor loadings shown are ≥0.30.

To test whether the same factors were extracted without multiple imputation, the EFA was rerun using principle axis factoring and listwise deletion. This produced the same solution as iteration 2.

7.2.1.4 Factor structure

Both iterations of the EFA resulted in two factor solutions, however due to low Cronbach's alpha across the two factors, it was not advisable to combine them into a single measure. Factor 1 consisted of questions from the pupil survey (Table 7.5) and factor 2 from the teacher survey (Table 7.6). The variables from iteration 2 were retained rather than iteration 1 as the sole difference was an additional variable (variable 16) in iteration 2, which potentially offered greater explanatory power.

Variable	Variable Name	Variable Question
12	SEng_Activity	At our school, pupils have a say in planning and organising school activities and school events
13	SEng_Project	At our school, pupils have a lot of chances to help decide and plan school projects
14	SEng_Pupil	At our school, pupils' ideas are treated seriously
15	SEng_Idea	At our school, my ideas are treated seriously
16	TSup_Care	I feel that my teachers care about me as a person
17	TSup_Talk	There is at least one teacher or other member of staff at this school who I can talk to about things that worry me

Table 7.5: Interim factor 1 structure (alpha = 0.94; omega = 0.95). All questions taken from pupil survey and representing student engagement and teacher support classification domains

Variable	Variable Name	Variable Question
5	SEng_Council	How frequently do you use consultations with school council to involve students in policy developments?
6	SEng_Group	How frequently do you use consultations with other student voice groups to involve students in policy developments?
7	SEng_Wider	How frequently do you use wider consultations with students (e.g. surveys) to involve students in policy developments?
10	SEng_Policy	At how many stages in the process of policy development are students involved?

Table 7.6: Final factor 2 structure (alpha = 0.77; omega = 0.80). All questions taken from teacher survey and representing student engagement classification domain

Factor 2 has an acceptable alpha and uniqueness scores that, while not all high - high scores for uniqueness are generally accepted as being 0.60 or higher (Stata.com 2020) - are acceptable.

Factor 1 however has very high alpha and low uniqueness scores for some of the variables, suggesting redundancy. It has been suggested that the maximum alpha should be 0.9 (Tavakol and Dennick 2011) because redundancy can affect content validity (Diamantopoulos et al. 2012). Therefore, the variables in factor 1 were reassessed to determine whether any should be removed from the measure. By dropping variables 13 and 14 which were highly correlated with other variables and had low uniqueness scores, factor 1 now consists of four indicators and has an acceptable alpha of 0.88 (Table 7.7).

Variable	Variable Name	Variable Question
12	SEng_Activity	At our school, pupils have a say in planning and organising school activities and school events
15	SEng_Idea	At our school, my ideas are treated seriously
16	TSup_Care	I feel that my teachers care about me as a person
17	TSup_Talk	There is at least one teacher or other member of staff at this school who I can talk to about things that worry me

Table 7.7: Final factor 1 structure (alpha = 0.88; omega = 0.89). All questions taken from pupil survey and representing student engagement and teacher support classification domains

The questions from factor 1 were aggregated scores from the pupil survey, and therefore provide student perceptions of boundaries between students and teachers as well as students and decision-making processes within the school. The four indicators were summed to produce the final measure (all indicators were scored out of 5 and equally weighted within the measure) as factor scores are likely to be unstable and therefore not provide a realistic means of weighting each item (Osborne 2014). Therefore this measure will be referred to as 'pupil perceptions of school boundaries'. The second factor consists of four questions from the teacher survey, and provides a teacher perspective of the extent to which students are included in school decision making, and the extent to which there may be boundaries between students and the decisions made within the school about priorities. This measure will be referred to as 'teacher perceptions of school boundaries'. Variable 10 was scored out of 7, while the other three indicators were scored out of 6, therefore variable 10 was weighted to be scored out of 6, and all four indicators summed to produce the measure.

The final item loadings are displayed in Figure 7.2.

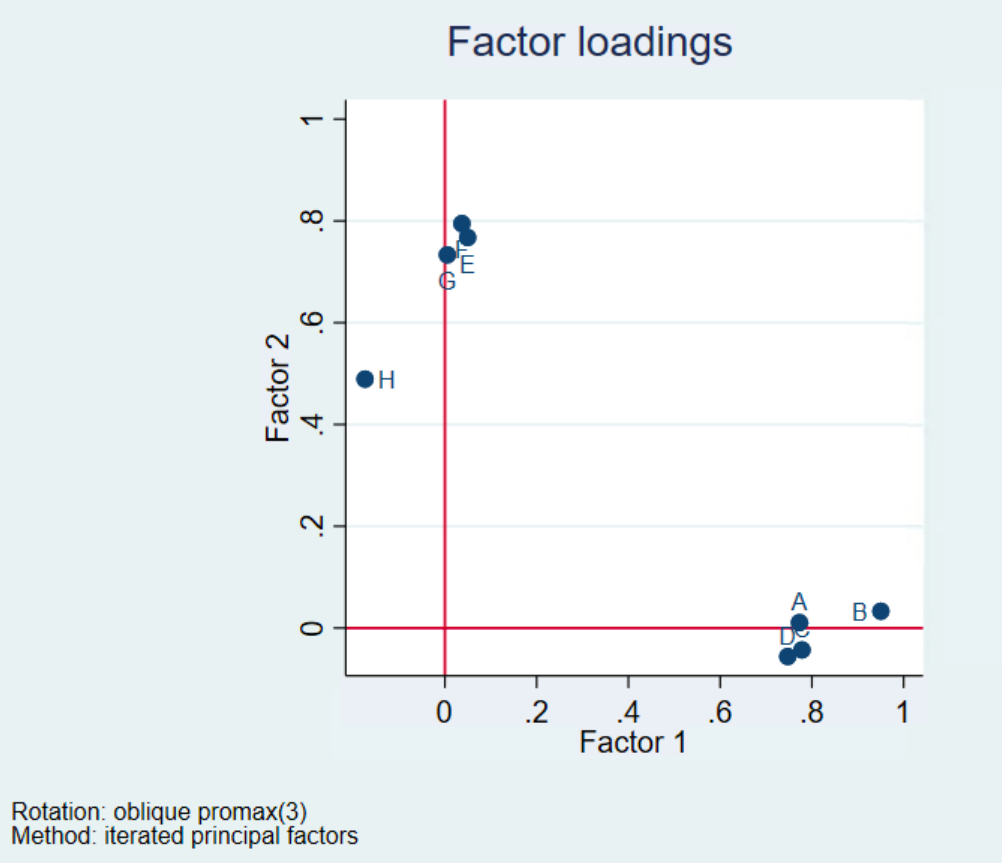

Figure 7.2: Rotated factor solution for the two extracted factors following iterated principal axis factoring and oblique (promax) rotation. Each letters represents a variable included in the EFA. Axes values represent factor loadings for each variable

7.2.2. Meaningfulness measure

For the meaningfulness measure, standardised residuals for achievement and attainment were moderately correlated in the two models (r=0.41), suggesting schools with higher attainment also tend to have higher levels of attendance. The PCA retained one factor accounting for 70.41% of variance and with factor loadings of +0.71 for both attendance and attainment residuals. These residuals were summed and standardised to have a mean of zero and a standard deviation of one in order to create the meaningfulness measure.

7.2.3 Descriptive statistics

Descriptive statistics for the school-level measures are presented in Table 7.8. Both of the classification measures produced were normally distributed (Figure

7.3; Figure 7.4). They share very little variation (r=0.08; n=160; p=0.30), suggesting divergence of views between teachers and pupils on school boundaries. The standardised meaningfulness scores produced for each school were also normally distributed (Figure 7.5).

Measure	N (secondary schools)	Mean	Standard deviation
Pupil perceptions of school boundaries	201	13.77	0.65
Teacher perceptions of school boundaries	161	14.61	3.86
Meaningfulness	199	0.00	1.00

Table 7.8: Summary statistics of school-level measures - pupil and teacher perceptions of school environment and school meaningfulness

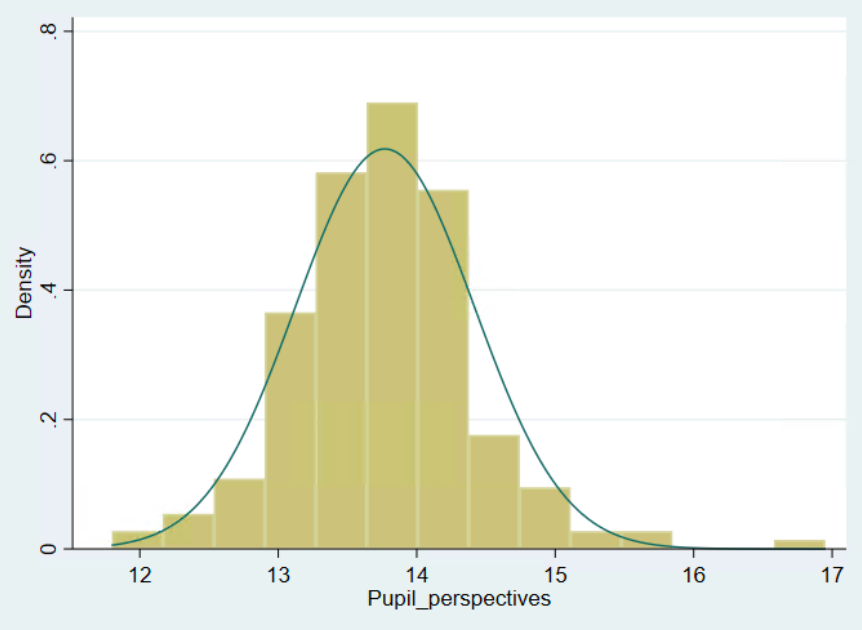

Figure 7.3: Histogram of pupil perceptions measure scores for each secondary school (n=201)

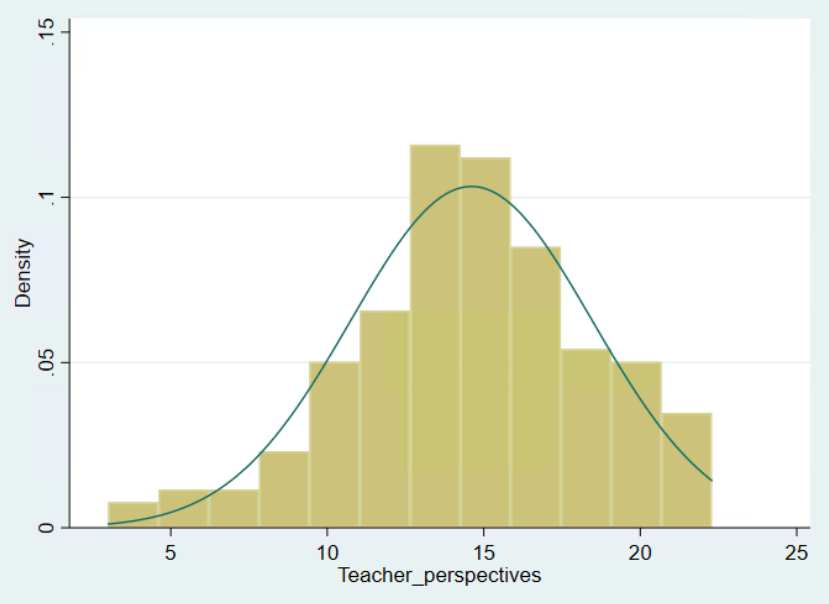

Figure 7.4: Histogram of teacher perceptions measure for each secondary school (n=161)

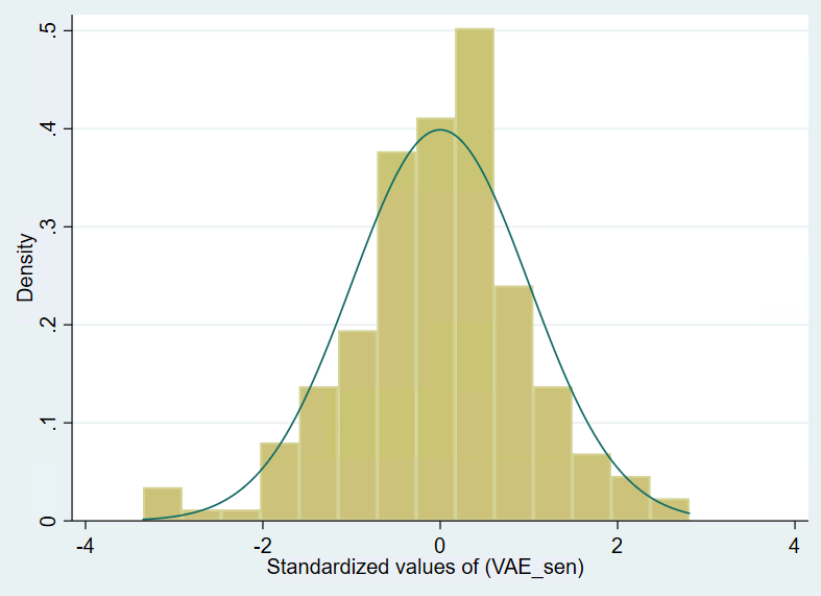

Figure 7.5: Histogram of meaningfulness measure for each secondary school (n=199)

For the meaningfulness measure, correlations of the five predictor variables and the two outcome variables are shown in Table 7.9. Of particular note are the high negative correlations between %FSM eligibility and both outcome variables. There is also a high correlation between %FSM and SEN and moderate negative correlations between percentage of children with SEN and both outcomes.

	%FSM	IMD ranking	% Female	% SEN	% Ethnic minority	Attainment	Attendance
%FSM	1.0						
IMD ranking	-0.478	1.0					
% Female	-0.045	-0.101	1.0				
% SEN	0.566	-0.244	-0.115	1.0			
% Ethnic minority	0.256	-0.039	-0.013	0.014	1.0		
Attainment	-0.652	0.305	0.117	-0.403	0.099	1.0	
Attendance	-0.836	0.436	0.052	-0.492	-0.072	0.736	1.0

Table 7.9: Correlations of variables included in the meaningfulness measure

Four schools had meaningfulness scores more than +1.96 standard deviations from the mean (top 2.5% of schools), and two of these were above +2.58 standard deviations from the mean (top 0.5% of schools). Five schools had value-added scores more than -1.96 standard deviations from the mean (bottom 2.5% of schools), and of these, four were more than -2.58 standard deviations from the mean (bottom 0.5% of schools).

There was a small positive correlation between pupil perceptions of school boundaries (where higher scores are indicative of more positive perceptions of boundaries/weaker boundaries) and school-level meaningfulness ($r=0.24$; $n=177$; $p=0.001$) but almost no relationship between teacher perceptions of school boundaries and school-level meaningfulness ($r=0.08$; $n=142$; $p=0.34$). The proportion of students eligible for free school meals was positively associated with pupil perspectives of school boundaries ($r=0.19$; $n=177$; $p=0.01$) - i.e. students in less affluent schools tended to perceive school boundaries as more positive/weaker - but there was a smaller, negative association between teacher perspectives and %FSM ($r=-0.15$; $n=142$; $p=0.08$). Therefore in contrast to the students, teachers in less affluent schools perceived there to be stronger boundaries than teachers in more affluent schools. Meaningfulness was not associated with % free school eligibility of a school ($r=0.00$; $n=199$; $p=0.97$), however, there was a significant positive association between meaningfulness and school attainment ($r=0.58$; $n=199$; $p<0.001$) and meaningfulness and school attendance ($r=0.44$; $n=199$; $p<0.001$).

7.3 Summary and conclusion

This analysis has produced two school-level measures of classification and one meaningfulness measure using secondary data from Welsh secondary schools. The classification analysis sought to combine pupil and teacher data to encompass the full range of classification domains available in the datasets: discipline, student engagement, teacher support and parent engagement. Perhaps unsurprisingly, given that the questions were not developed for this purpose, this was problematic. Two separate measures have therefore been developed that assess teacher perceptions of school boundaries and pupil perceptions of school boundaries. No questions on discipline or parent engagement remained in the final analysis and therefore the measures produced only assess a small proportion of the classification concept. The teacher measure is particularly limited as the questions included are solely focused on student involvement in policy development within the school and not other forms of student engagement.

The next chapter will use these three school-level measures as part of a multi-level analysis of the factors influencing mental health across the primary to secondary transition.

8. Study two: Individual and school environment level predictors of mental health and wellbeing across the primary to secondary transition using multi-level modelling

As has been evidenced in the earlier literature review, the transition from primary to secondary school can have negative impacts on mental health in some children. Chapter six highlighted four classes of trajectories of mental health that young people may experience across this school transition, as well as individual-level factors that predict which classes young people are most likely to be part of. However, individual-level factors are only part of the story. Schools themselves may influence mental health outcomes in young people, and this chapter seeks to better understand school-level factors alongside individual-level predictors. It will build on the previous chapter that described the development of school-level classification and meaningfulness measures that aim to quantify aspects of school culture, and are hypothesised to influence young people's mental health outcomes.

8.1 Methods

The dataset combined two linked surveys conducted within the DECIPHer research centre in 2019. CHETS was a survey that took place when students were in the final year of primary school (year 6, aged 10-11 years) while the SHRN pupil survey took place the following academic year in the first year of secondary school (year 7, age 11-12 years). CHETS was carried out in the spring/summer of 2019 prior to transition and SHRN in the autumn/winter of 2019, post transition. The CHETS survey included 2,170 respondents from 73 primary schools across Wales (Moore et al. 2020). The SHRN survey included 119,388 respondents in years 7 to 11 from 198 secondary schools across Wales. In year 7, 26,786 students responded, an 81% response rate (Page et al. 2021b). The fact that the SHRN survey involved almost all secondary schools in Wales meant that most pupils who had participated in the CHETS survey would be in Year 7 within a school where the SHRN survey was taking place. Within the CHETS survey, pupils were asked to provide their name, month and year of birth and the

secondary school they anticipated transitioning to, in order to enable linkage across the transition. In the SHRN survey, pupils were asked to provide their name, date of birth and to indicate which primary school they attended. These data for linkage were requested at the end of the SHRN survey. As described above, approximately 19% of Year 7 pupils in Wales did not complete the SHRN survey. Of those who did, approximately 15% did not reach the end of the survey, while pilot work indicated that of those who reached the end of the survey, around half would provide accurate data for linkage (Morgan et al. 2020). Hence, it was anticipated that approximately 30% of CHETS participants would be linked to SHRN survey responses. A ready anonymised linked dataset was provided by DECIPHer for these analyses, which comprised all children who participated in both surveys (while in Years 6 and 7 respectively) and provided sufficient information for accurate linkage.

In total, data for 602 children (28% of CHETS survey participants) were successfully linked and included in this dataset. Of these students, the majority transitioned with a large group of their peers to the same secondary school. A small number of students were excluded from analyses due to non-standard transition. These included situations where one or two children from an English medium primary transitioned to a Welsh medium secondary while the majority of their cohort transitioned to a common English language secondary; where one or two children transitioned to a faith school rather than their catchment secondary and in one case where children were split at transition into separate boys and girls secondary schools. To map and understand these different types of non-standard transition, where young people's experiences are likely to be different to those transitioning with the majority of their cohort, would require a larger sample size with more children within these non-standard transition categories. Given the relatively small sample, it was therefore decided to focus on the more dominant, standard form of primary to secondary transition.

The pupils included in the final sample of 512 attended 60 different primary schools and transitioned to 52 different secondary schools in Wales (Figure 8.1). All students from each primary school transitioned to the same secondary school, however, eight secondary schools received pupils from two primary schools. All remaining secondary schools received pupils from just one primary school within

this dataset. Therefore the students were nested within primary schools which were nested within secondary schools.

8.1.1 Measures

In the year 6 CHETS survey, two scales were used from the Me and My School (MMS) questionnaire as measures of mental health problems. MMS contains 16 items, of which 10 comprise an emotional difficulties scale and six comprise a behavioural difficulties scale (Deighton et al. 2013). Post-transition in the year 7 SHRN survey, mental wellbeing was measured using the short form of the Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS). Data were transformed as per Stewart-Brown et al (2009). The scale is scored out of a maximum of 35 and scores were normally distributed. To assess mental health difficulties in year 7, the child-report Strengths and Difficulties Questionnaire (SDQ) was used (as was the case in chapter six). It is a 25 item scale comprising five subscales of five items, with each item scored from 0-2. As in the LCGA analysis, four of the five subscales were used: emotional problems, conduct problems, hyperactivity and peer problems subscales. A total difficulties score was calculated by summing these subscales. The data were positively skewed and therefore a square root transformation was used to improve the normality of the data for the total difficulties score. This transformation of SDQ scores has been used in other studies (for example, Hill et al, 2016). The analysis also used two SDQ subscales separately as dependent variables - the emotional problems and conduct problems subscales. Although both subscales were also positively skewed, these were not improved by transformation and were used in their raw form.

In both the year 6 CHETS survey and the year 7 SHRN survey, the Family Affluence Scale (FAS) was administered to assess socio-economic status of participants. FAS is a six item scale which asks whether their family owns a car or other vehicle, whether they have their own bedroom, the number of computers in the home, how many bathrooms they have and whether they have a dishwasher (Hobza, 2017). The sixth question, which asks how many holidays they had the previous year was included in the SHRN scale, but excluded from CHETS as

public involvement consultations prior to survey administration assessed that younger children did not consistently understand the question. Therefore, while the CHETS FAS scale is scored out of 9, the SHRN FAS scale is out of 12. Where the analysis solely uses a family affluence scale score as a predictor variable, this is based on the SHRN scores out of 12. Where the analysis uses a change score to assess whether a decrease or increase in family affluence between primary and school might influence outcomes, this is calculated based using a modified SHRN score (excluding the final question so that it is out of 9) minus the CHETS score so that the same scales are used.

Finally, a single item from the year 6 CHETS survey that asked students to what extent they were worried about the transition to secondary school was included in the analysis. It was scored on a likert scale from 1 (not at all) to 5 (very much).

Four school-level variables were included in the analysis. These all related to the secondary, rather than primary schools that the children attended: school-level meaningfulness, pupil perceptions of school boundaries, teacher perceptions of school boundaries and percentage of children eligible for free school meals (%FSM). The development of the first three level-two variables was described in depth in the previous chapter, based on the full SHRN dataset of schools. %FSM was based on the three year average (from 2017-2019) value of free school meal eligibility provided by Stats Wales on the My Local School website. Data from these four school-level measures were merged with the individual-level data, resulting in schools without individual-level data (due to not participating in SHRN, or none of the children in the school having participated in CHETS) being removed from the analysis (Figure 8.1). The descriptive statistics below will therefore differ slightly to those in chapter seven, which included the full number of schools.

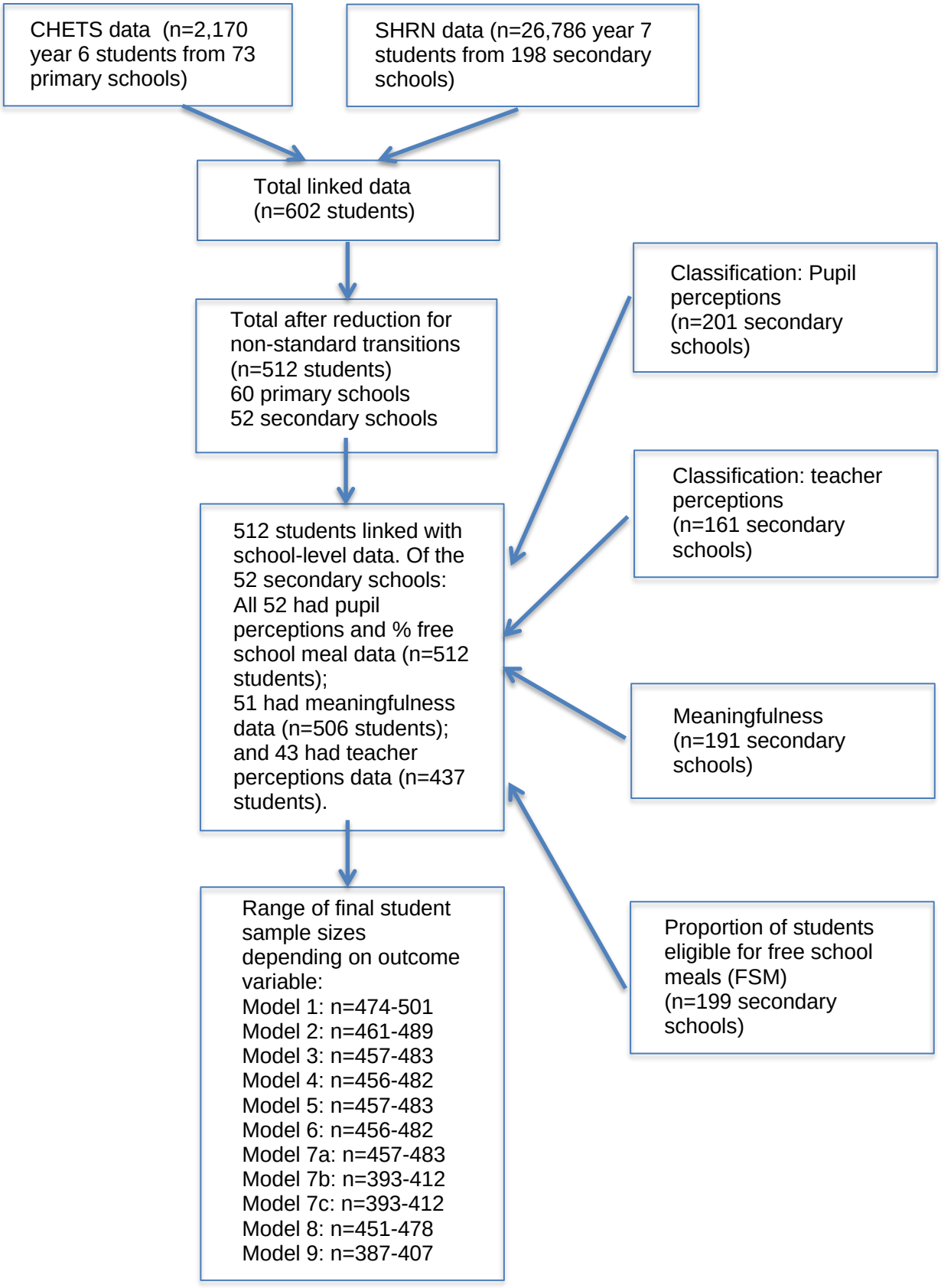

Figure 8.1: Flowchart of data linkage and changes in sample sizes throughout the multi-level analysis

8.1.2 Multi-level modelling

A series of hierarchical linear mixed-effects models were developed to answer the two overarching questions. The models were repeated for each of the four possible outcome variables - SWEMWBS, SDQ total difficulties score, SDQ emotional problems and SDQ conduct problems. All models were run in STATA version 15 using maximum likelihood estimation. In order to answer the two overarching research questions, a number of models were developed.

- RQ3: To what extent are socioeconomic status, gender, being worried about transition and pre-transition mental health important individual-level predictors of mental health difficulties and mental wellbeing following transition to secondary school?

Model 1: Null model. No variables, but variance in outcome measures was split between individual and school level. This allows the relative importance of individual and school level variables to predicting each outcome variable to be understood.

Model 2: Individual level demographic variables were added to the null model for each outcome measure (pre-transition emotional and behavioural difficulties, gender and year 7 family affluence). Controlling for pre-transition difficulties allowed only variation in the outcomes that had emerged post-transition to be explained. Gender is likely to be an important predictor, particularly for the emotional difficulties and conduct problems outcomes, where research suggests emotional difficulties are likely to be higher in girls and conduct problems higher in boys (Leadbeater et al. 1999; Green et al. 2005). Finally, family affluence was added as SES also has an empirical basis for being considered important to mental health outcomes across the primary to secondary transition (Jindal-Snape et al. 2020).

Model 3: Model 2 was further developed by the addition of the variable assessing the extent to which a child had been worried about transition. Being worried about transition is of particular interest as it is an individual-level variable that is

associated with poor mental health post-transition and also has potential to be modified. By including pre-transition difficulties within the model, this analysis would help to understand whether being worried is a reflection of wider emotional difficulties or whether it has predictive power separate from these difficulties.

Model 4: Family affluence is not static for many children, and it was hypothesised that experiencing a drop in family affluence might make the transition to secondary school more stressful and have a negative impact on mental health beyond that of having low family affluence across both time points. Therefore a change score for family affluence was added to the variables included in Model 3.

- RQ4: After taking individual-level predictors into account, to what extent are school-level meaningfulness, classification and affluence important school-level predictors of mental health and mental wellbeing following transition to secondary school?

Model 5*:* The individual-level variables from Model 3 were added to by regressing school-level %FSM eligibility on the outcome variables. School level %FSM is an important variable because it assesses the overall affluence of children in the school. Previous research has found that low school affluence is associated with a range of child health outcomes, including poorer dietary behaviours, lower levels of physical activity and more risky sexual health behaviours (Shrewsbury et al. 2018; Peralta et al. 2019; Underwood et al. 2021). Notably Moore et al. (2020) found a particular risk for mental wellbeing in children from low SES primary schools who transitioned to a more affluent secondary school.

Model 6: A cross-level interaction term of change in family affluence X %FSM eligibility was added to the individual-level variables in model 3, with change in family affluence and %FSM included as main effects. It was hypothesised that children who experienced a decrease in family affluence between year 6 and 7 might have particular difficulty if they were transitioning to a high affluence school, as their change in affluence would be particularly evident relative to the high affluence in the school.

Model 7a, 7b, 7c: These models added the two classification measures (pupil perceptions of school boundaries and teacher perceptions of school boundaries) first individually, and then together to the variables in Model 5 or to Model 6 where the interaction term in Model 6 was retained.

Model 8: School-level meaningfulness was regressed on the outcome variable, in addition to the other variables included in Model 5, or to Model 6 where the interaction term in Model 6 was retained.

Model 9: The final model consisted of Model 7c, which included the two classification measures, with the addition of the school-level meaningfulness variable, to assess the relative importance of these school-level variables to each mental health outcome.

Random coefficient models were tested for throughout. Where the random coefficient model was a significantly better fit for the data, the random coefficient was retained for subsequent models, unless STATA was unable to model it due to lack of variance.

8.2 Results

8.2.1 Descriptive statistics

8.2.1.1 CHETS descriptive statistics

A large minority of pupils stated that they were either quite worried (22.31%) or very worried (14.54%) about moving to secondary school. Clinical cut offs for the Me and My School scores were based on Deighton et al. (2013). Pre-transition Me and My School scores suggest that 7.23% of respondents had clinically relevant emotional difficulties, and 5.86% had clinically relevant behavioural difficulties (Table 8.1). This sub-sample of CHETS data can be compared with the full, nationally representative sample used in Angel et al. (2021) and Moore et al. (2021). For emotional and behavioural difficulties there are very similar frequencies in this subsample across each category compared to the national

sample. The demographic characteristics in the subsample are also relatively similar to the national sample and there are no obvious biases.

8.2.1.2 SHRN descriptive statistics

The mean SWEWMBS score was 22.57 (SD = 4.58). Based on Warwick Medical School (2020) thresholds, nearly 1 in 4 pupils (25.20%) had low mental wellbeing (Table 8.2). Just 11.33% had high mental wellbeing. The mean value of the total difficulties SDQ summed scale was 10.69 (out of a maximum of 40; SD = 6.44). One in 10 pupils (10.34%) had a very high total difficulties score and an additional 1 in 20 (5.27%) had a high difficulties score (Youth in Mind 2016). The mean value of the SDQ conduct scale was 1.83 (SD=1.86) and the mean value of the emotional problems subscale was 3.39 (SD = 2.54). The mean family affluence scale score in year 7 was 8.31 (SD = 2.28).

		Frequency (%)
Gender	Boy	235 (45.90)
	Girl	277 (54.10)
	Prefer to self-describe / not to answer	0 (0.00)
Family structure	Both parents	330 (64.45)
	Step family	64 (12.50)
	Single parent	89 (17.38)
	Grandparents	9 (1.76)
	Care home / foster care	4 (0.78)
	Other / missing	16 (3.13)
Family affluence scale (scored out of 9)	Low (0-5)	169 (33.01)
	Medium (6-7)	211 (41.21)
	High (8-9)	131 (25.59)
	Missing	1 (0.20)
Emotional difficulties	Expected (0-9)	410 (82.03)
	Elevated - Borderline (10-11)	43 (8.40)
	Elevated - Potentially clinical significant (12+)	37 (7.23)
	Missing	12 (2.34)
Behavioural difficulties	Expected (0-5)	444 (86.72)
	Elevated - Borderline (6)	26 (5.08)
	Elevated - Potentially clinically significant (7+)	30 (5.86)
	Missing	12 (2.34)
Worried about secondary	Not at all	94 (18.36)
	Very little	154 (30.08)
	Somewhat	69 (13.48)
	Quite a bit	112 (21.88)
	Very much	73 (14.26)
	Missing	10 (1.95)

Table 8.1: Descriptive statistics for CHETS pre-transition (year 6) survey data. N=512.

		Frequency (%)
Family affluence scale (scored out of 12)	Low (0-7)	180 (35.16)
	Medium (8-9)	157 (30.66)
	High (10-12)	173 (33.79)
	Missing	2 (0.39)
Family affluence scale (scored out of 9)	Low (0-5)	156 (30.47)
	Medium (6-7)	203 (39.65)
	High (8-9)	152 (29.69)
	Missing	1 (0.20)
SWEMWBS	High mental wellbeing (27.50-35.00)	58 (11.33)
	Average mental wellbeing (19.51-27.49)	315 (61.52)
	Low mental wellbeing (7.00-19.50)	129 (25.20)
	Missing	10 (1.95)
SDQ total difficulties	Close to average (0-14)	330 (64.45)
	Slightly raised (15-17)	70 (13.67)
	High (18-19)	25 (4.88)
	Very high (20-40)	49 (9.57)
	Missing	38 (7.42)

Table 8.2: Descriptive statistics for SHRN post-transition (year 7) survey data. N=512.

The different SDQ difficulties scales were moderately negatively correlated with SWEMWBS (Table 8.3).

	SDQ total difficulties	SDQ conduct problems	SDQ emotional difficulties	SDQ peer problems	SDQ hyperactivity
SWEMWBS	-0.5714	-0.3833	-0.4601	-0.3951	-0.4295

Table 8.3: Correlation coefficients (Pearson's r) between SDQ scales and SWEMWBS

8.2.1.3 Change scores across transition

While over 200 of the 512 pupils scored the same in the Family Affluence Scale in year 7 compared to 6 (using the SHRN scores out of 9), the remaining students increased or decreased their score, with a small number seeing considerable movement up or down the scale (Appendix 2). Over a third of students (34.18%) experienced an increase in affluence between primary and secondary school, while a quarter (25.20%) experienced a decrease in affluence. The pre- and post-

transition scores of family affluence were moderately correlated (r=0.69), and explained approximately 50% of the variance in each other (r^2=48.1%).

8.2.1.4 School-level descriptive statistics

Within this sample, the mean school meaningfulness score was 0.14 (SD=0.83; range -1.76 to +1.87); the mean pupil perceptions score was 13.77 (SD=0.62; range 12.62 to 15.50) and the mean teacher perceptions score was 15.87 (SD=4.12; range 3.00 to 22.29). For the school-level %FSM eligibility, the mean aggregate value was 16.34% (SD=6.29; range 4.10% to 30.70%).

8.2.2 Missing data

There was an overall relatively low level of missing data across the individual and school level variables. Within measures made of multiple indicators, where more than half of the indicators had a response, an average value was calculated to enable the measure to be used. For example, SWEMWBS consists of seven questions - as long as four were answered, averages were used to provide an overall SWEMWBS score. This is also the method advocated for use with the SDQ (Youth in Mind 2016).

At the individual-level, the variable with the most missing data was SDQ, which had 38/512 pupils missing data (7.4%). There are two school-level variables with missing data - meaningfulness, which had six pupils missing data (all six pupils attended the same school which was new and had no year 11 achievement data available to create the measure) and teacher perceptions of boundaries which had 75 pupils missing data (nine schools). This was because none of the nine schools had completed the teacher survey. Three hundred and eighty-four pupils (75%) had complete data for all of the variables in the analysis. Sixty-four pupils (12.5%) had just the teacher perspectives variable missing and 16 (3%) had the SDQ variables missing, but all other variables complete. Listwise deletion was used in the analysis. Listwise deletion provides unbiased and precise estimates if data are missing completely at random (MCAR) or missing at random (MAR) (Koutoumanou et al. 2020).

Sample statistics for the full sample of students (n=512 overall but slightly lower for some variables - see Table 8.1 and 8.2) is compared below in Table 8.4 to sample statistics for the final SDQ conduct problems model, which had the lowest sample size (n=387) of all of the models. This suggests the samples are not dissimilar across a range of important variables.

	Full sample	Lowest sample (n=393)
	Mean (sd)	Mean (sd)
Female	0.54 (0.50)	0.52 (0.50)
Family affluence scale (SHRN data out of 12)	8.31 (2.28)	8.21 (2.35)
Emotional difficulties	6.16 (3.60)	6.13 (3.62)
Behavioural difficulties	2.74 (2.26)	2.64 (2.22)
SWEMWBS	22.57 (4.58)	22.68 (4.63)
SDQ total difficulties	10.69 (6.44)	10.57 (6.39)
Worried about secondary	2.83 (1.36)	2.76 (1.34)
%FSM aggregate mean	16.34 (6.29)	16.66 (6.45)

Table 8.4: Comparison of sample statistics for full sample (n=512) and final SDQ conduct problems model (n=393). Standard deviation (sd).

8.3 Multi-level analysis

For all four outcome variables a likelihood ratio test was used to compare a three level null model (pupils nested in primary schools nested in secondary schools) and a two level null nested model (pupils nested in secondary schools) to assess the best fit for the data (Figure 8.2). The three-level model was not a significantly better fit than the two-level model for any of the outcomes, and hence subsequent analyses use the simpler two-level models. For SWEMWBS, SDQ total difficulties and SDQ conduct problems subscale, the two-level model was a significantly better fit than its single-level linear equivalent (likelihood ratio test, $p<0.05$). However, for the emotional problems subscale the two level null model was not significantly better than the single-level equivalent at $p<0.05$ ($p=0.0719$). In the following analysis for all dependent variables, while the p-value comparing the linear model to the multi-level model is still below 0.1, the multi-level model will be used as the p-values are conservative upper bounds to the true value, and it may therefore be appropriate to reduce them to obtain a more accurate estimation (Leckie 2010). Where the p-value rises above 0.1, the analysis will revert to a single-level linear regression. Where a single-level model, rather than multilevel

model has been run, this is noted within the relevant table. Tables 8.6, 8.7, 8.8 and 8.9 present the multi-level models for all four dependent variables.

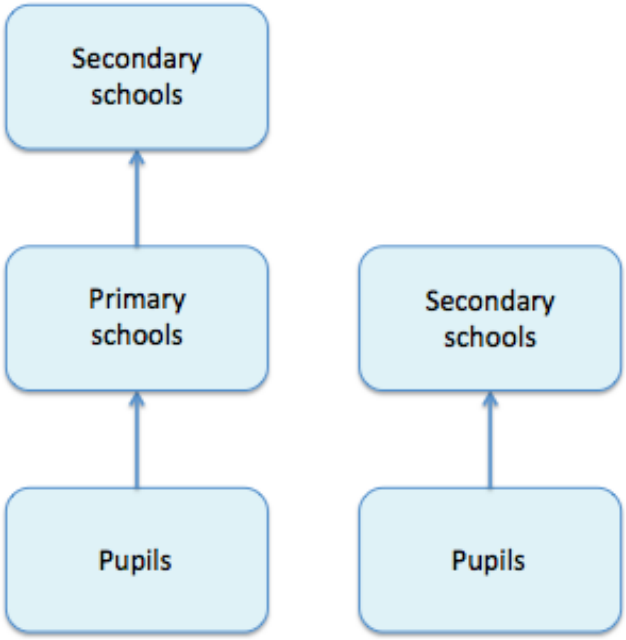

Figure 8.2: Three-level vs two-level nested structures

8.3.1 Model 1

To assess the relative proportions of variance attributable to school and pupil level effects for each outcome variable, a null model was run, where $y_{ij} = \beta_0 + u_j + e_{ij}$

β_0 = overall mean of outcome variable; u_j = secondary school (level 2) residuals; e_{ij} = pupil (level 1) residuals.

The relative distribution of variance between-school and within-school variation for each outcome variable was calculated based on the null model statistics:

$$\text{Between school variance} = \frac{\text{Secondary school variance}}{(\text{Residual variance} + \text{secondary school variance})}$$

The emotional problems subscale had much lower between-school variability than the other scales (Table 8.5). Intra-class correlations were also calculated for

each outcome. Shackleton et al. (2016a) found that ICCs for psychosocial health outcomes ranged from 0.01-0.07. The ICCs found here are at the higher end of this range (and the SDQ conduct scale is slightly above it). This suggests that children within each cluster are more alike (and more different to those in other clusters) in terms of their mental health than you would expect. This may be because these subpopulations of young people all transitioned from the same primaries and so are a more homogenous sample of young people than the secondary school populations as a whole.

Outcome variable	Between-school variance	Within-school variance	Intra-class correlation
SWEMWBS	5.95%	94.05%	0.06
SDQ total difficulties	7.57%	92.43%	0.04
SDQ emotional problems subscale	3.48%	96.52%	0.05
SDQ conduct problems subscale	6.50%	93.50%	0.08

Table 8.5: Distribution of variance for all outcome variables and intra-cluster correlations

8.3.2 Model 2

The SDQ emotional and conduct problems subscales were matched with their relevant pre-transition indicator (the former with the pre-transition emotional difficulties variable, and the latter with the pre-transition behavioural difficulties variable). For SWEMWBS and SDQ total difficulties, both pre-transition mental health measures were included in the models. For all outcomes, pre-transition mental health was a significant predictor ($p<0.001$) and this persisted throughout the increasingly adjusted models. Gender was only significant for emotional problems ($p=0.026$), with females having higher difficulties. Family affluence was a significant predictor of SDQ total difficulties ($p=0.019$) and neared significance for SWEMWBS ($p=0.066$).

These models all assumed a fixed slope, i.e. that irrespective of secondary school, the relationship between all of the level 1 variables and the outcome variable would be the same. However, it is possible that different schools have different relationships between some or all of the independent variables (e.g.

gender; family affluence; pre-transition emotional and behavioural wellbeing). Random terms for gender, family affluence and pre-transition mental health were tested for each outcome. For SWEMWBS, SDQ and the SDQ emotional problems subscale, none of the models were significantly better than their fixed slope equivalents. Notably, for all random models, the correlations between intercepts and gradients were nearing 1, all suggesting that the variance was insufficient to effectively model the random components and that the models were likely over-fitted relative to the sample and group sizes (STATACorp 2019).

For the conduct problems subscale, adding a random effect for pre-transition behavioural problems was a significant improvement on the fixed model (likelihood ratio test, $p<0.05$). It suggests that the relationship between pre-transition behavioural problems and conduct problems scores in year 7 varies by school. Children with higher behaviour problems scores in year 6 will, on average, experience different conduct problems outcomes in year 7 depending on which secondary school they transition to (Figure 8.3). The gap between secondary schools widens as year 6 behaviour scores increase, so that a child who has a score of 5 in year 6 will on average score approximately two points higher in conduct problems if they attend the school represented by the top line, compared to that represented by the bottom line.

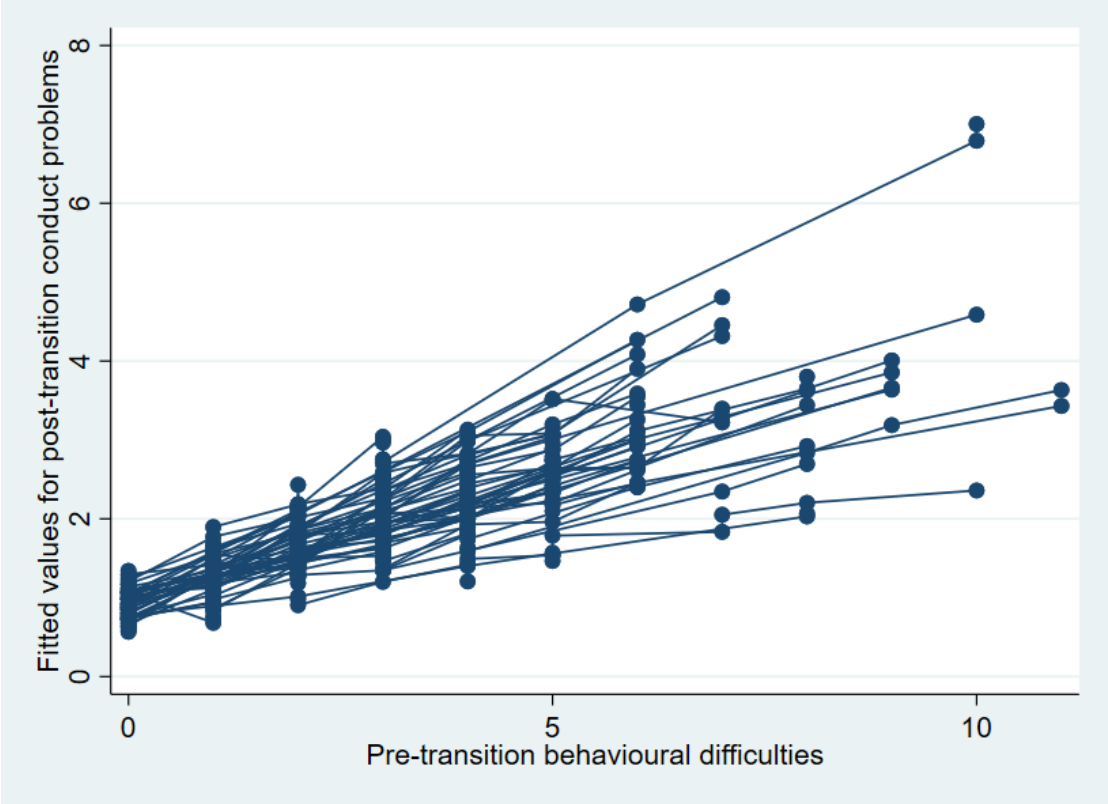

Figure 8.3: School trajectories for conduct problems in secondary school as a function of pre-transition behavioural difficulties (fitted values are adjusted for gender, family affluence and pre-transition behavioural difficulties). Each line represents a secondary school.

The random effect will be added to subsequent models due to the likelihood ratio test result, however, it should be noted that there may be minimal variance to model the random effect, as the correlation between slopes and intercepts is almost 1. The random coefficient for pre-transition behavioural difficulties will be retained for future models where STATA is able to model it and still produce standard errors of the variance components.

8.3.3 Model 3

The 'worried about secondary' variable was added to the models, and higher values were associated with lower year 7 SWEMWBS scores (p=0.017) and higher emotional problems (p=0.007). It was not a significant predictor of either SDQ total difficulties or conduct problems. Within model 3 for all outcomes, all pre-transition measures of mental health remained significant. Lower family affluence remained a significant predictor of higher SDQ total difficulties and was also associated with lower mental wellbeing (p=0.063). Gender was marginally

non-significant for both SDQ subscales. A random slope model was tested for the 'worried about secondary' variable, but was not a significant improvement on the fixed slope model for any of the dependent variables, and in line with the earlier random coefficient analyses, the intercept/gradient correlation was nearly 1, suggesting lack of variability to model the random effect. From null model to model 3, within school variance decreased by 14.42% for SWEMWBS and by 19.49% for SDQ total difficulties.

8.3.4 Model 4

Change in family affluence was not a significant predictor of mental health difficulties or mental wellbeing in any of the models ($p>0.05$). Adding a random coefficient for change in affluence did not produce models that had a significantly improved fit on the fixed coefficient model, although for the SWEMWBS model, it was only marginally non-significant ($p=0.0590$). For both SWEWMBS and SDQ emotional problems, being worried about secondary school remained a significant predictor of outcomes ($p=0.011$ and $p=0.006$, respectively).

8.3.5 Model 5

The first level two variable added to the models was percentage of pupils eligible for free school meals (%FSM) in each secondary school. For the emotional difficulties subscale, the multi-level model was not a significantly better fit for the data ($p=0.14$) and so was replaced with a single-level linear regression. %FSM was not significant for any of the outcomes, although neared significance for emotional problems ($p=0.058$). The coefficient is negative, suggesting that having accounted for individual-level family affluence, as %FSM eligibility increases (i.e. school affluence decreases), emotional problems tend to decrease (Figure 8.4). Adding the school-level variable resulted in individual family affluence becoming significant for SWEMWBS ($p=0.046$) and SDQ total difficulties ($p=0.011$). This suggests that %FSM and family affluence may be operating in opposite directions - while low family affluence may be associated with poorer student mental health, schools with a high proportion of students eligible for free school meals may be better at supporting student mental health. It is therefore not until you adjust for school level %FSM that the individual-level effect is unmasked.

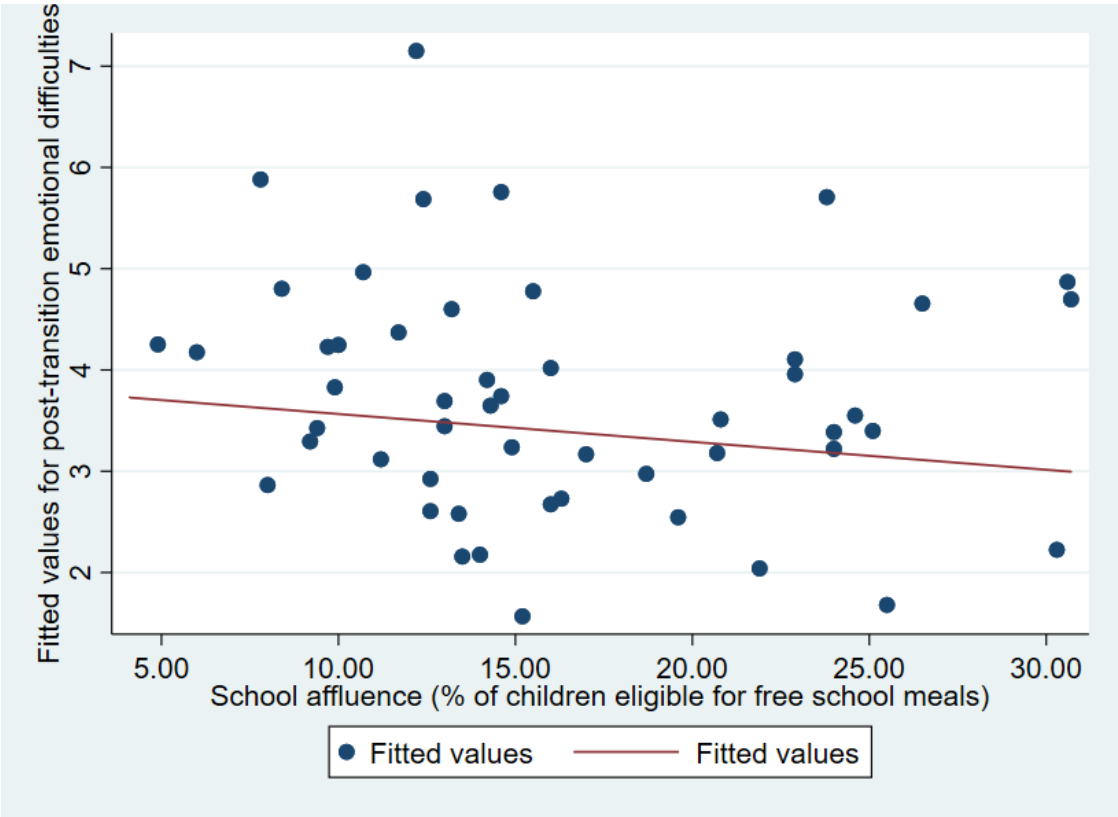

Figure 8.4: Relationship between school-level FSM eligibility and the fitted model for the emotional difficulties subscale of the SDQ. Fitted values are adjusted for gender, family affluence, worried about transition and pre-transition emotional difficulties)

8.3.6 Model 6

It was hypothesised that children who have experienced an individual decrease in family affluence would be most vulnerable to the impact of transition on mental health, and that moving to a more affluent school might augment this impact. Therefore a cross-level interaction was added to the models. In line with Heisig and Schaeffer (2019), the lower-level variable was added to the models as a random effect along with the interaction term. Omitting the lower level random effect has been shown to inaccurately shift findings towards statistical significance, making effects seem larger than in reality.

There is no significant interaction between experiencing an individual level change in affluence across the school transition and the %FSM of the secondary school being transitioned to, on SWEMWBS (p=0.955) and the model did not

have a significantly improved fit on the same model excluding the cross level interaction. Similarly, no significant interaction was found for SDQ total difficulties (p=0.152). For conduct problems, it was not possible to run a model with two random effects (pre-transition behavioural difficulties and change in family affluence), therefore the pre-transition behavioural difficulties random effect was dropped from this model in order to model the cross-level interaction. The interaction between change in family affluence and secondary school %FSM was nearing significance (p=0.06), and this same finding was replicated for the emotional problems subscale (p=0.07). This suggests that the relationship between change in family affluence and emotional/conduct problems in year 7 may be moderated by the %FSM of the secondary school.

In practical terms, using the emotional subscales regression coefficients (the direction of effect is the same for the conduct subscale):

0.29(Change in family affluence) - 0.03(%FSM) - 0.02(Change in family affluence X %FSM)

If everything else is held constant, in a school with %FSM of 5%, a child who has a drop in affluence of -1 point will experience an average decrease in their emotional problems following transition of 0.34 points; the same child transitioning to a school with 25% FSM, will experience, on average, a decrease in their emotional problems score of 0.54 points - i.e. in the less affluent school, the child will have fewer emotional problems. For children who have experienced a decrease in their family affluence, it therefore appears that transitioning to a school with lower affluence will be more supportive of their emotional health than transitioning to a school with higher affluence. This supports the finding in model 5 that there may be a protective effect on mental health of transitioning to a low affluence school if you come from a poorer family, whether because these schools are better at supporting mental health, or because transitioning to a more affluent school when you are relatively poor leads to negative social comparison. This will be considered more in the discussion chapter.

Due to the difficulties of modelling multiple random effects in the conduct subscale models, the cross-level interaction was not retained in models 7, 8, 9.

However, where models 7, 8 and 9 were run to include the interaction effect (data not shown) the interaction term became significant. For the emotional subscale, the interaction term will be retained in subsequent models.

8.3.7 Models 7a,b,c

Neither school-level pupil perceptions nor school-level teacher perceptions of school boundaries were significant predictors of any of the dependent variables in year 7 individually (models 7a and 7b) or combined (7c).

8.3.8 Model 8

The meaningfulness variable was not a significant predictor of SDQ total difficulties or the SDQ conduct and emotional problems subscales ($p>0.05$). However, it was a significant predictor of mental wellbeing scores ($p=0.031$). This suggests that a school with a one point higher score for meaningfulness will have an average higher SWEMWBS score by 0.65 points in year 7, adjusted for gender, individual affluence, pre-transition mental health, being worried about transition, and secondary school %FSM (Figure 8.5).

8.3.9 Model 9

With all school-level variables included in the models, meaningfulness remains a significant predictor of SWEMWBS in year 7 ($p=0.005$) but not for the other outcomes. Neither classification variable is significant in any of the models. Pre-transition mental health remains significant in for all outcomes. For SDQ total difficulties, family affluence ($p=0.025$) remains significant and in the emotional problems subscale, a number of variables are significant, including being worried about transition ($p=0.027$) and the interaction between secondary school free-school meal eligibility and change in family affluence ($p=0.018$).

Despite meaningfulness being the only significant school-level predictor, it is notable that the school-level residual variance has decreased to its lowest level in the SWEWMBS model (from 1.04 in model 8 which just includes %FSM and meaningfulness at the school-level to 0.62 in model 9 where the two classification

measures have been added). Decreases are also apparent in the SDQ total difficulties and SDQ conduct problems sub-scale. It is some evidence that the school-level predictors, even when not significant within the models are explaining important school-level variability

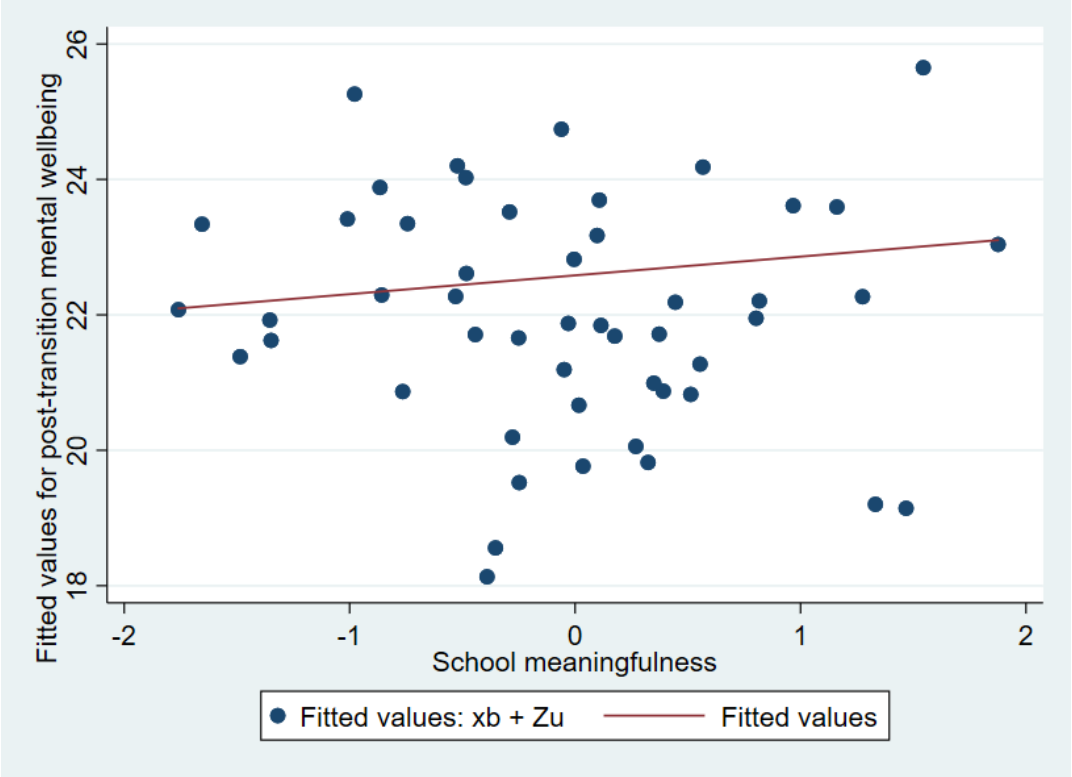

Figure 8.5: Relationship between fitted SWEMWBS values (adjusted for gender, family affluence, pre-transition behavioural and emotional difficulties, worried about secondary school and school affluence) and meaningfulness scores.

	Model 1 (n=502)	Model 2 (n=489)	Model 3 (n=483)	Model 4 (n=482)	Model 5 (n=483)	Model 6 (n=482)	Model 7a (n=483)	Model 7b (n=412)	Model 7c (n=412)	Model 8 (n=478)	Model 9 (n=407)
Residual variance	19.77 [17.37, 22.50]	17.47 [15.32, 19.92]	17.05 [14.94, 19.46]	16.92 [14.82, 19.31]	17.06 [14.95, 19.47]	16.50 [14.44, 18.84]	17.09 [14.97, 19.50]	17.04 [14.77, 19.65]	17.04 [14.77, 19.66]	17.07 [14.96, 19.49]	17.03 [14.76, 19.65]
Female		-0.40 [-1.18, 0.38] p=0.31	-0.27 [-1.06, 0.51] p=0.50	-0.25 [-1.04, 0.54] p=0.531	-0.26 [-1.05, 0.52] p=0.510	-0.25 [-1.03, 0.53] p=0.532	-0.23 [-1.02, 0.56] p=0.566	-0.27 [-1.11, 0.58] p=0.534	-0.23 [-1.08, 0.61] p=0.586	-0.19 [-0.98, 0.60] p=0.632	-0.18 [-1.02, 0.67] p=0.686
Family affluence		0.16 [-0.01, 0.33] p=0.07	0.16 [-0.01, 0.33] p=0.06	0.10 [-0.08, 0.28] p=0.29	0.17 [0.00, 0.35] p=0.05	0.09 [-0.09, 0.28] p=0.31	0.17 [-0.01, 0.34] p=0.06	0.17 [-0.01, 0.35] p= 0.07	0.15 [-0.03, 0.34] p=0.10	0.16 [-0.01, 0.33] p=0.06	0.13 [-0.05, 0.31] p=0.15
Pre-transition emotional difficulties		-0.28 [-0.40,-0.17] p<0.001	-0.22 [-0.34,-0.09] p=0.001	-0.22 [-0.34,-0.09] p=0.001	-0.21 [-0.34,-0.09] p=0.001	-0.22 [-0.34,-0.10] p<0.001	-0.21 [-0.34,-0.09] p=0.001	-0.27 [-0.40,-1.14] p<0.001	-0.27 [-0.40,-0.13] p<0.001	-0.22 [-0.35,-0.10] p<0.001	-0.28 [-0.41,-0.14] p<0.001
Pre-transition behavioural difficulties		-0.40 [-0.58,-0.21] p<0.001	-0.40 [-0.58,-0.22] p<0.001	-0.40 [-0.58,-0.22] p<0.001	-0.40 [-0.59,-0.22] p<0.001	-0.40 [-0.57,-0.22] p<0.001	-0.41 [-0.59,-0.23] p<0.001	-0.39 [-0.59,-0.19] p<0.001	-0.39 [-0.59,-0.20] p<0.001	-0.38 [-0.56,-0.20] p<0.001	-0.36 [-0.56,-0.16] p<0.001
Worried about secondary			-0.38 [-0.70,-0.07] p=0.02	-0.41 [-0.73,-0.09] p=0.01	-0.40 [-0.71,-0.08] p=0.01	-0.39 [-0.70,-0.08] p=0.02	-0.41 [-0.72,-0.09] p=0.01	-0.28 [-0.63, 0.06] p=0.11	-0.31 [-0.65, 0.04] p=0.08	-0.37 [-0.69,-0.06] p=0.02	-0.30 [-0.64, 0.05] p=0.09
Change in family affluence				0.24 [-0.06, 0.53] p=0.11		0.20 [-0.60, 1.00] p=0.62					
Secondary school FSM					0.04 [-0.04, 0.13] p=0.31	0.04 [-0.05, 0.12] p=0.40	0.03 [-0.06, 0.11] p=0.51	0.04 [-0.05, 0.13] p=0.36	0.02 [-0.07, 0.11] p=0.69	0.02 [-0.06, 0.11] p=0.55	-0.01 [-0.09, 0.07] p=0.82
Pupil perceptions							0.52 [-0.33, 1.37] p=0.23		0.79 [-0.21, 1.78] p=0.12		0.77 [-0.17, 1.71] p=0.11
Teacher perceptions								0.00	-0.03		-0.10

								[-0.13, 0.14] p=0.96	[-0.17, 0.10] p=0.63		[-0.24, 0.04] p=0.15
Meaningfulness										0.65 [0.06, 1.24] p=0.03	0.83 [0.24, 1.41] p=0.01
School FSM X Change in family affluence						0.00 [-0.04, 0.05] p=0.96					
Residual variance of random effects											
Secondary school	1.25 [0.42, 3.74]	1.26 [0.46, 3.43]	1.36 [0.52, 3.56]	1.37 [0.53, 3.53]	1.27 [0.47, 3.47]	1.31 [0.51, 3.36]	1.13 [0.38, 3.36]	1.25 [0.42, 3.73]	1.07 [0.32, 3.57]	1.04 [0.35, 3.08]	0.62 [0.12, 3.20]
Change in family affluence						0.17 [0.03, 1.00]					
Likelihood ratio test: vs single level linear model	0.005	0.002	<0.001	<0.001	0.002	0.003	0.005	0.004	0.011	0.005	0.065

Table 8.6: Model parameters for SWEMWBS. Coefficients, [confidence intervals], and p-values. Model 1: null model; Model 2: adjusted for individual demographics; Model 3: worried about transition; Model 4: change in family affluence; Model 5: school-level %FSM eligibility; Model 6: cross level interaction; Model 7a: pupil perceptions of boundaries (classification); Model 7b: teacher perceptions of boundaries (classification); Model 7c: pupil and teacher perceptions of boundaries (classification); Model 8: Meaningfulness; Model 9: all school-level covariates

	Model 1 (n=474)	Model 2 (n=461)	Model 3 (n=457)	Model 4 (n=456)	Model 5 (n=457)	Model 6 (n=456)	Model 7a (n=457)	Model 7b (n=393)	Model 7c (n=393)	Model 8 (n=451)	Model 9 (n=387)
Residual variance	1.09 [0.96, 1.25]	0.88 [0.77, 1.01]	0.88 [0.77, 1.01]	0.88 [0.77, 1.01]	0.88 [0.77, 1.01]	0.87 [0.76, 1.00]	0.88 [0.77, 1.01]	0.91 [0.79, 1.05]	0.91 [0.79, 1.05]	0.88 [0.77, 1.01]	0.92 [0.79, 1.06]
Female		-0.10 [-0.28, 0.08] p=0.27	-0.12 [-0.31, 0.06] p=0.19	-0.13 [-0.32, 0.05] p=0.160	-0.12 [-0.31, 0.06] p=0.181	-0.14 [-0.32, 0.04] p=0.137	-0.13 [-0.31, 0.05] p=0.164	-0.18 [-0.38, 0.02] p=0.08	-0.18 [-0.38, 0.02] p=0.08	-0.12 [-0.30, 0.07] p=0.21	-0.18 [-0.38, 0.02] p=0.09
Family affluence		-0.05 [-0.09, -0.01] p=0.02	-0.05 [-0.09,-0.01] p=0.02	-0.04 [-0.08, 0.00] p=0.058	-0.05 [-0.09,-0.01] p=0.01	-0.04 [-0.08,-0.00] p=0.05	-0.05 [-0.09, -0.01] p=0.014	-0.05 [-0.09,-0.01] p=0.02	-0.05 [-0.09,-0.01] p=0.03	-0.05 [-0.09,-0.01] p=0.01	-0.05 [-0.09,-0.01] p=0.03
Pre-transition emotional difficulties		0.10 [0.07, 0.12] p<0.001	0.09 [0.06, 0.12] p<0.001	0.09 [0.06, 0.12] p<0.001	0.09 [0.06, 0.12] p<0.001	0.09 [0.06, 0.12] p<0.001	0.09 [0.06, 0.12] p<0.001	0.10 [0.07, 0.13] p<0.001	0.10 [0.07, 0.13] p<0.001	0.09 [0.06, 0.12] p<0.001	0.10 [0.07, 0.13] p<0.001
Pre-transition behavioural difficulties		0.08 [0.04, 0.13] p<0.001	0.08 [0.04, 0.13] p<0.001	0.08 [0.04, 0.13] p<0.001	0.09 [0.04, 0.13] p<0.001	0.08 [0.04, 0.13] p<0.001	0.09 [0.04, 0.13] p<0.001	0.08 [0.03, 0.13] p=0.001	0.08 [0.03, 0.13] p=0.001	0.08 [0.04, 0.13] p<0.001	0.08 [0.03, 0.12] p=0.002
Worried about secondary			0.04 [-0.03, 0.11] p=0.28	0.04 [-0.03, 0.12] p=0.25	0.05 [-0.03, 0.12] p=0.23	0.05 [-0.03, 0.12] p=0.21	0.05 [-0.03, 0.12] p=0.21	0.02 [-0.06, 0.10] p=0.57	0.03 [-0.06, 0.11] p=0.53	0.04 [-0.03, 0.12] p=0.28	0.02 [-0.06, 0.10] p=0.64
Change in family affluence				-0.03 [-0.10, 0.04] p=0.36		0.08 [-0.09, 0.26] p=0.34					
Secondary school FSM					-0.02 [-0.03, 0.00] p=0.12	-0.01 [-0.03, 0.00] p=0.14	-0.01 [-0.03, 0.01] p=0.22	-0.01 [-0.03, 0.00] p=0.15	-0.01 [-0.03, 0.01] p=0.23	-0.01 [-0.03, 0.00] p=0.13	-0.01 [-0.03, 0.01] p=0.31
Pupil perceptions							-0.10 [-0.29, 0.10] p=0.34		-0.06 [-0.28, 0.16] p=0.597		-0.08 [-0.30, 0.14] p=0.46
Teacher perceptions								0.01	0.01		0.02

								[-0.02, 0.04] p=0.60	[-0.02, 0.04] p=0.50		[-0.01, 0.05] p=0.25
Meaningfulness										-0.01 [-0.15, 0.14] p=0.913	-0.00 [-0.14, 0.14] p=0.97
School FSM X Change in family affluence						-0.01 [-0.02, 0.00] p=0.15					
Residual variance of random effects											
Secondary school	0.09 [0.03, 0.24]	0.07 [0.03, 0.19]	0.07 [0.03, 0.19]	0.07 [0.03, 0.19]	0.07 [0.02, 0.18]	0.06 [0.02, 0.18]	0.06 [0.02, 0.17]	0.04 [0.01, 0.17]	0.04 [0.01, 0.17]	0.07 [0.02, 0.18]	0.04 [0.01, 0.17]
Change in family affluence						0.00 [0.00, 0.49]					
Likelihood ratio test: vs single-level linear model	0.002	<0.001	<0.001	0.001	0.002	0.031	0.003	0.037	0.041	0.002	0.053

Table 8.7: Model parameters for SDQ total difficulties. Coefficients, [confidence intervals], and p-values. Model 1: null model; Model 2: adjusted for individual demographics; Model 3: worried about transition; Model 4: change in family affluence; Model 5: school-level %FSM eligibility; Model 6: cross level interaction; Model 7a: pupil perceptions of boundaries (classification); Model 7b: teacher perceptions of boundaries (classification); Model 7c: pupil and teacher perceptions of boundaries (classification); Model 8: Meaningfulness; Model 9: all school-level covariates

	Model 1 (n=479)	Model 2 (n=467)	Model 3 (n=462)	Model 4 (n=461)	Model 5 (n=462)	Model 6 (n=461)	Model 7a (n=461)	Model 7b (n=395)	Model 7c (n=395)	Model 8 (n=455)	Model 9 (n=389)
Residual variance	6.25 [5.47, 7.14]	5.04 [4.40, 5.76]	4.90 [4.28, 5.61]	4.90 [4.28, 5.61]	Single-level	Single-level	Single-level	Single-level	Single-level	Single-level	Single-level
Female		0.48 [0.06, 0.90] p=0.03	0.37 [-0.05, 0.79] p=0.08	0.35 [-0.08, 0.77] p=0.11	0.35 [-0.08, 0.77] p=0.11	0.32 [-0.11, 0.74] p=0.14	0.32 [-0.11, 0.75] p=0.14	0.31 [-0.15, 0.77] p=0.18	0.32 [-0.14, 0.78] p=0.18	0.34 [-0.09, 0.77] p=0.12	0.34 [-0.12, 0.80] p=0.15
Family affluence		-0.06 [-0.16, 0.03] p=0.17	-0.06 [-0.16, 0.03] p=0.16	-0.06 [-0.16, 0.04] p=0.23	-0.07 [-0.16, 0.02] p=0.14	-0.06 [-0.15, 0.04] p=0.27	-0.06 [-0.16, 0.04] p=0.27	-0.05 [-0.15, 0.06] p=0.39	-0.05 [-0.15, 0.06] p=0.37	-0.06 [-0.16, 0.04] p=0.27	-0.05 [-0.15, 0.06] p=0.38
Pre-transition emotional difficulties		0.29 [0.23, 0.35] p<0.001	0.25 [0.19, 0.31] p<0.001	0.25 [0.18, 0.31] p<0.001	0.25 [0.18, 0.31] p<0.001	0.24 [0.18, 0.31] p<0.001	0.24 [0.18, 0.31] p<0.001	0.25 [0.18, 0.32] p<0.001	0.25 [0.18, 0.32] p<0.001	0.24 [0.18, 0.30] p<0.001	0.25 [0.18, 0.32] p<0.001
Worried about secondary			0.24 [0.07, 0.41] p=0.007	0.24 [0.07, 0.41] p=0.01	0.25 [0.08, 0.42] p=0.01	0.26 [0.09, 0.43] p=0.004	0.26 [0.08, 0.43] p=0.004	0.22 [0.03, 0.41] p=0.02	0.21 [0.02, 0.40] p=0.03	0.26 [0.09, 0.44] p=0.003	0.22 [0.02, 0.41] p=0.03
Change in family affluence				-0.06 [-0.22, 0.11] p=0.50		0.29 [-0.12, 0.69] p=0.16	0.29 [-0.11, 0.70] p=0.16	0.43 [-0.02, 0.89] p=0.06	0.43 [-0.02, 0.89] p=0.06	0.29 [-0.12, 0.69] p=0.17	0.44 [-0.02, 0.90] p=0.06
Secondary school FSM					-0.03 [-0.07, 0.00] p=0.06	-0.03 [-0.06, 0.01] p=0.10	-0.03 [-0.07, 0.01] p=0.10	-0.03 [-0.06, 0.01] p=0.14	-0.03 [-0.07, 0.01] p=0.10	-0.03 [-0.07, 0.01] p=0.11	-0.03 [-0.07, 0.01] p=0.18
Pupil perceptions							0.06 [-0.30, 0.42] p=0.74		0.15 [-0.29, 0.58] p=0.51		0.08 [-0.37, 0.52] p=0.74
Teacher perceptions								0.04 [-0.01, 0.09] p=0.14	0.03 [-0.02, 0.09] p=0.26		0.06 [-0.01, 0.13] p=0.08
Meaningfulness										0.01 [-0.25, 0.27] p=0.97	-0.03 [-0.31, 0.26] p=0.86

School FSM X Change in family affluence						-0.02 [-0.04, 0.00] p=0.07	-0.02 [-0.04, 0.00] p=0.06	-0.03 [-0.05,-0.00] p=0.02	-0.03 [-0.05,-0.00] p=0.02	-0.02 [-0.04, 0.00] p=0.07	-0.03 [-0.05,-0.01] p=0.02
Random effects residual variance											
Secondary school	0.22 [0.04, 1.19]	0.17 [0.03, 0.95]	0.17 [0.03, 0.90]	0.16 [0.03, 0.92]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Change in family affluence						N/A	N/A	N/A	N/A	N/A	N/A
Likelihood ratio test: vs single level linear model	0.072	0.075	0.071	0.081		>0.1	>0.1	>0.1	>0.1	>0.1	>0.1

Table 8.8: Model parameters for SDQ emotional problems subscale. Coefficients, [confidence intervals], and p-values. Model 1: null model; Model 2: adjusted for individual demographics; Model 3: worried about transition; Model 4: change in family affluence; Model 5: school-level %FSM eligibility; Model 6: cross level interaction; Model 7a: pupil perceptions of boundaries (classification); Model 7b: teacher perceptions of boundaries (classification); Model 7c: pupil and teacher perceptions of boundaries (classification); Model 8: Meaningfulness; Model 9: all school-level covariates

	Model 1 (n=482)	Model 2a (n=470)	Model 2b (n=470)	Model 3 (n=466)	Model 4 (n=465)	Model 5 (n=466)	Model 6 (n=465)	Model 7a (n=466)	Model 7b (n=399)	Model 7c (n=399)	Model 8 (n=460)	Model 9 (n=393)
Residual variance	3.23 [2.83, 3.69]	2.67 [2.33, 3.05]	2.57 [2.24, 2.94]	2.56 [2.23, 2.93]	2.56 [2.24, 2.93]	2.56 [2.23, 2.93]	2.65 [2.31, 3.04]	2.56 [2.24, 2.93]	2.66 [2.30, 3.07]	2.65 [2.29, 3.07]	2.50 [2.18, 2.86]	2.52 [2.17, 2.92]
Female		-0.26 [-0.56, 0.05] p=0.10	-0.25 [-0.55, 0.06] p=0.11	-0.28 [-0.59, 0.03] p=0.08	-0.28 [-0.59, 0.03] p=0.08	-0.28 [-0.59, 0.03] p=0.08	-0.29 [-0.61, 0.02] p=0.07	-0.28 [-0.59, 0.03] p=0.08	-0.27 [-0.60, 0.06] p=0.11	-0.27 [-0.61, 0.06] p=0.11	-0.30 [-0.61, 0.01] p=0.06	-0.29 [-0.62, 0.04] p=0.09
Family affluence		-0.03 [-0.10, 0.04] p=0.41	-0.04 [-0.10, 0.03] p=0.28	-0.03 [-0.10, 0.04] p=0.37	-0.03 [-0.10, 0.04] p=0.40	-0.03 [-0.10, 0.03] p=0.33	-0.02 [-0.09, 0.05] p=0.58	-0.03 [-0.10, 0.04] p=0.35	-0.03 [-0.10, 0.04] p=0.38	-0.03 [-0.10, 0.04] p=0.40	-0.04 [-0.10, 0.03] p=0.28	-0.04 [-0.11, 0.03] p=0.23
Pre-transition behavioural difficulties		0.32 [0.25,0.39] p<0.001	0.35 [0.27, 0.43] p<0.001	0.35 [0.27, 0.43] p<0.001	0.35 [0.27, 0.43] p<0.001	0.35 [0.27, 0.43] p<0.001	0.32 [0.25, 0.38] p<0.001	0.35 [0.27, 0.43] p<0.001	0.28 [0.20, 0.35] p<0.001	0.28 [0.20, 0.35] p<0.001	0.35 [0.27, 0.43] p<0.001	0.31 [0.23, 0.40] p<0.001
Worried about secondary				0.08 [-0.04, 0.19] p=0.19	0.08 [-0.04, 0.19] p=0.20	0.08 [-0.04, 0.19] p=0.19	0.07 [-0.05, 0.19] p=0.26	0.08 [-0.04, 0.19] p=0.18	0.07 [-0.05, 0.20] p=0.26	0.07 [-0.05, 0.20] p=0.24	0.08 [-0.04, 0.19] p=0.19	0.08 [-0.05, 0.20] p=0.23
Change in family affluence					0.00 [-0.12, 0.12] p=0.98		0.27 [-0.03, 0.57] p=0.08					
Secondary school FSM						-0.01 [-0.04, 0.02] p=0.61	-0.01 [-0.04, 0.02] p=0.51	-0.01 [-0.04, 0.03] p=0.69	-0.01 [-0.04, 0.02] p=0.44	-0.01 [-0.04, 0.02] p=0.57	-0.01 [-0.04, 0.03] p=0.74	-0.01 [-0.04, 0.03] p=0.66
Pupil perceptions								-0.07 [-0.40, 0.27] p=0.70		-0.08 [-0.45, 0.28] p=0.66		0.01 [-0.37, 0.39] p=0.95
Teacher perceptions									0.02 [-0.02, 0.07] p=0.31	0.03 [-0.02, 0.08] p=0.27		0.02 [-0.04, 0.08] p=0.47
Meaningfulness											-0.09	-0.10

											[-0.33, 0.15] p=0.46	[-0.34, 0.14] p=0.42
School FSM X Change in family affluence							-0.02 [-0.03, 0.00] p=0.06					
Residual variance of random effects												
Secondary school	0.22 [0.08, 0.67]	0.20 [0.07, 0.56]	0.02 [0.00, 1.46]	0.02 [0.00, 1.08]	0.02 [0.00, 0.06]	0.02 [0.00, 1.28]	0.20 [0.07, 0.58]	0.02 [0.00, 1.40]	0.10 [0.02, 0.58]	0.10 [0.02, 0.57]	0.02 [0.00, 1.36]	0.01 [0.00, 9.74]
Pre-transition behavioural difficulties			0.02 [0.00, 0.06]	0.02 [0.00, 0.06]	0.02 [0.00, 1.14]	0.02 [0.00, 0.06]	*	0.02 [0.00, 0.06]	*	*	0.02 [0.01, 0.07]	0.01 [0.00, 0.08]
Change in family affluence							0.00 [0.00, 5.46]					
Likelihood ratio test: vs single level linear model	0.004	0.002	<0.001	<0.001	<0.001	<0.001	0.049	0.001	0.079	0.077	<0.001	0.095

Table 8.9: Model parameters for SDQ conduct problems subscale. Coefficients, [confidence intervals], and p-values. Model 1: null model; Model 2a: adjusted for individual demographics; Model 2b: adjusted for individual demographics plus random coefficient for pre-transition behavioural difficulties; Model 3: worried about transition; Model 4: change in family affluence; Model 5: school-level %FSM eligibility; Model 6: cross level interaction; Model 7a: pupil perceptions of boundaries (classification); Model 7b: teacher perceptions of boundaries (classification); Model 7c: pupil and teacher perceptions of boundaries (classification); Model 8: Meaningfulness; Model 9: all school-level covariates. Asterisk (*) denotes that model failed to produce standard errors when random coefficient included, so model was run without random effect for pre-transition behavioural difficulties

8.3 Summary and conclusion

This analysis has sought to investigate both individual-level and school-level predictors of mental health in the transition from primary school to secondary school. As expected, there was considerably more variability at the individual than school level (for all four outcomes, over 90% of variability was at the individual-level). For all outcome measures and models, pre-transition scores of emotional and/or behavioural difficulties were significant, suggesting that the most consistent predictor of mental health difficulties and low mental wellbeing in year 7 (post-transition) is having poor mental health in year 6 (pre-transition). Other key predictors varied based on the outcome being considered, at both the individual and school level.

The next chapter will consider interventions that have been developed to support the mental health and wellbeing of children and young people across educational transitions, and consider whether they reflect the findings of earlier chapters about the important predictors of a positive mental health transition. It will also consider a broader range of transitions than just primary to secondary on the basis that there may be important learning from other transition interventions, and that children's lives form trajectories of mental health that are punctuated by transition events. While primary to secondary transition has been the subject of much research, other school transitions should be considered important to maintaining child mental health.

9. Study three: Systematic review of universal interventions that target educational transitions

The previous empirical chapters have presented evidence on the individual-level and school-level factors that influence young people's mental health as they transition from primary to secondary school. Having identified a number of potential targets at the individual and school level for improving mental health across the primary to secondary transition, this chapter presents a systematic review of interventions that have sought to improve mental health and wellbeing of young people across three types of educational transition. The three types of transition are: entry into school from a pre-school setting; primary to secondary school; and school to post-compulsory education. While the analyses in previous chapters have solely focused on the primary to secondary transition, this review will go beyond that for three main reasons. Firstly, it was unclear prior to carrying out the review whether the number of interventions aimed at the primary to secondary transition would be sufficient to draw comparisons and conclusions; secondly, other transition interventions are likely to offer insight into approaches to improving mental health across transitions that can support understandings of primary to secondary transition; and thirdly, all three types of transition are theoretically similar and therefore of interest, representing life events within a mental health trajectory across the life course, with young people's experiences mediated by the psychosocial and flexible resources they possess. This chapter has been published as a journal article (Donaldson et al. 2022) where the focus was on the first three research questions presented here at the request of reviewers due to space considerations. A protocol for this review is available on PROSPERO (Donaldson et al. 2020).

Interventions can either be universal or targeted at specific groups of individuals. This review will focus on universal interventions, unless the interventions are specifically targeted at young people from low SES backgrounds. Low socioeconomic status, as previously argued, is associated with chronic stress due to poor living and working conditions, discrimination, a sense of powerlessness and financial worries (Baum et al. 1999), and is a powerful determinant of health outcomes (Link and Phelan 2010; Valles 2018). Research suggests that children

within the poorest primary schools already have worse mental wellbeing than those in more affluent primary schools, but transitioning to a secondary schools in which others are better off than them is associated with a further negative impact on wellbeing (Moore et al., 2020). As school transition is the point at which young people first experience their new school culture, interventions that can support this process for children from poorer backgrounds have the potential to positively change the mental health and educational trajectories of young people across the life course, while also reducing inequalities.

This systematic review aims to answer two overarching research questions as set in chapter four (RQs 5 and 6), which have been further broken down into sub-questions. The first four sub-questions relate to the evidence of effectiveness of transition interventions:

- RQ5: What are the characteristics of effective school transition interventions?

    (i) Is there evidence that universal interventions, or those focused on young people with low socioeconomic status, are effective in supporting mental health across normative school transitions?
    (ii) Is there evidence of difference in the effectiveness of transition interventions according to their characteristics?
    (iii) How do characteristics of interventions differ by type of school transition?
    (iv) Is there evidence that gender, socio-economic status (SES) or geography (high/low income countries) moderates the impact of transition interventions?

- RQ6: What are the theories of change that mental health transition interventions draw upon?

The final question seeks to understand, from a critical realist perspective what the underlying mechanisms, operating in the ‘real’ might be for these transition interventions.

9.1 Methods

9.1.1 Eligibility criteria

Inclusion and exclusion criteria were developed based on extensive scoping searches and informed by the research questions. The population of interest included school pupils from when they entered school (at approximately 4 years of age) until they left school (at approximately 18 years of age). Cohorts where the majority of students were in this age range and not, for example, repeating years, were included. Interventions had to include a quantitative assessment of outcomes, and contain at least one universal component or be focused on students of a low socioeconomic status, either due to targeting these students within a school or because the school itself had a lower socioeconomic intake. Studies were included if they sought to improve mental health and wellbeing across transitions between two education settings, either: into school from nursery or pre-school; between schools (e.g. primary to secondary); or from school to post-compulsory education. Interventions could be either side of transition or both sides, and all types of intervention were included, including those that were school-based and/or home-based. They had to include a control group and baseline data had to be collected prior to transition, and prior to the start of the intervention, and at a follow up point after transition.

The mental health and wellbeing outcomes included were broad, and included those alluding to psychological outcomes linked to positive mental health and mental illness, stress, coping and psychological resilience; behavioral outcomes such as conduct disorder, and social outcomes, including social competence and peer relationships (see protocol on PROSPERO for more details). Parent, teacher, child and observer reports were included. There was no restriction on publication date, but papers had to be available in English. Books, dissertations and conference proceedings were excluded, as were interventions focused on non-normative school transitions (e.g. mid-year transfers).

9.1.2 Information sources

Seven databases (PsycInfo (OVID); EMBASE (OVID), Medline (OVID), ASSIA (Proquest), ERIC (EBSCO Host), Web of Science Core Collection and Scopus) were searched on 5th June 2019. An updated search was conducted on 11th October 2021.

9.1.3 Search strategy

Search terms were informed by the research questions and developed in Medline based on a combination of: mental health and wellbeing term AND school type adj4 transition AND intervention type, and then adapted for the other six databases (Appendix 3). The intervention types were based on the SIGN RCT search filter with some additional terms from the SIGN observational study filter (SIGN 2020). SIGN filters are pre-tested strategies that identify higher quality evidence indexed in medical databases (SIGN 2020). No quasi-experimental search filters were used as they have not been shown to be effective (Glanville et al. 2017). Mental health outcome terms were developed with reference to terms used in other mental health systematic reviews, including Hughes et al. (2013), Wiley et al. (2017) and Stanescu et al. (2019). The search strategy was then assessed against the PRESS guidelines checklist which includes questions about how the research question has been translated into search terms, and use of Boolean operators, subject headings, spelling, syntax and filters (McGowan et al. 2016).

9.1.4 Selection process

All searches were exported to Endnote (n=11,531) and deduplicated, leaving 6,494 entries. These papers were then exported into Rayyan for title/abstract screening. Title/abstract screening was completed by two reviewers independently of each other, and any disagreements resolved through discussion based on the inclusion criteria. Of the 135 papers put forward for full paper review from database searching, 100 were agreed on by both reviewers independently and a further 35 were identified by just one reviewer and then included following discussion. A further 153 papers that were identified by just one reviewer were

excluded from the full paper review following discussion. Therefore of the 135, 74% were identified by both reviewers independently. At this stage of the review, the main reason for papers being excluded was that they were not focused on the right population, either because the population described was not children undergoing an educational transition, or because the intervention presented was not universal but targeted as a subgroup of young people (68.2% of papers excluded). Citation searching was also undertaken to locate additional papers. This resulted in 154 papers for full paper review which was also carried out by two reviewers independently. An additional two papers were added to the systematic review following updated searches in October 2021. In total, 34 papers were included in the review as indicated by the PRISMA flowchart (Page et al. 2021a) in Figure 9.1.

9.1.5 Data collection process

A data extraction form was developed to capture details of the intervention, sample, mental health measures, data analysis, results, conclusions and limitations from each study. Data were extracted on all follow up time points post-transition as well as on all measures in each study that fit the inclusion criteria. Where more than one model of the analysis was presented, the model most closely aligned to principles of intention to treat (ITT) (or mITT) were extracted. As-treated data were extracted from papers where no ITT was presented. Where study information was not available from the paper, information was sought from other related papers where possible (e.g. study protocols or earlier papers from the same intervention study). Due to funding constraints, only one reviewer extracted data from all 34 papers, with a second reviewer independently checking four papers selected at random (12%). There was 100% agreement on the sample checked.

During extraction, but prior to any analysis being carried out, several adjustments were made to the protocol. The protocol stated that outcomes would be measures reported by parent or child, however this was extended to include teacher-report, assessor-report as well as any observation data available to ensure all relevant outcome measures were included. The protocol was also refined to clarify that

baseline measures had to be taken prior to the start of the intervention, and to ensure there was clarity around outcome measures as there were some grey areas about which concepts relating to mental health and wellbeing should be included. The decisions about which measures to include/exclude were made in discussion with the second reviewer and with reference to the actual questions asked within the measures, rather than just the description of the measure. Measures excluded included those related to relationships between teachers and students, classroom participation, and learning behaviours, even when these were referred to by authors as measures of mental health or socio-emotional adjustment. Measures where the primary focus was on attention difficulties and task orientation were also excluded. Finally, measures that assessed temperament and self-regulation were retained where the focus was on emotions or problem behaviour, but excluded when the focus was on cognitive development.

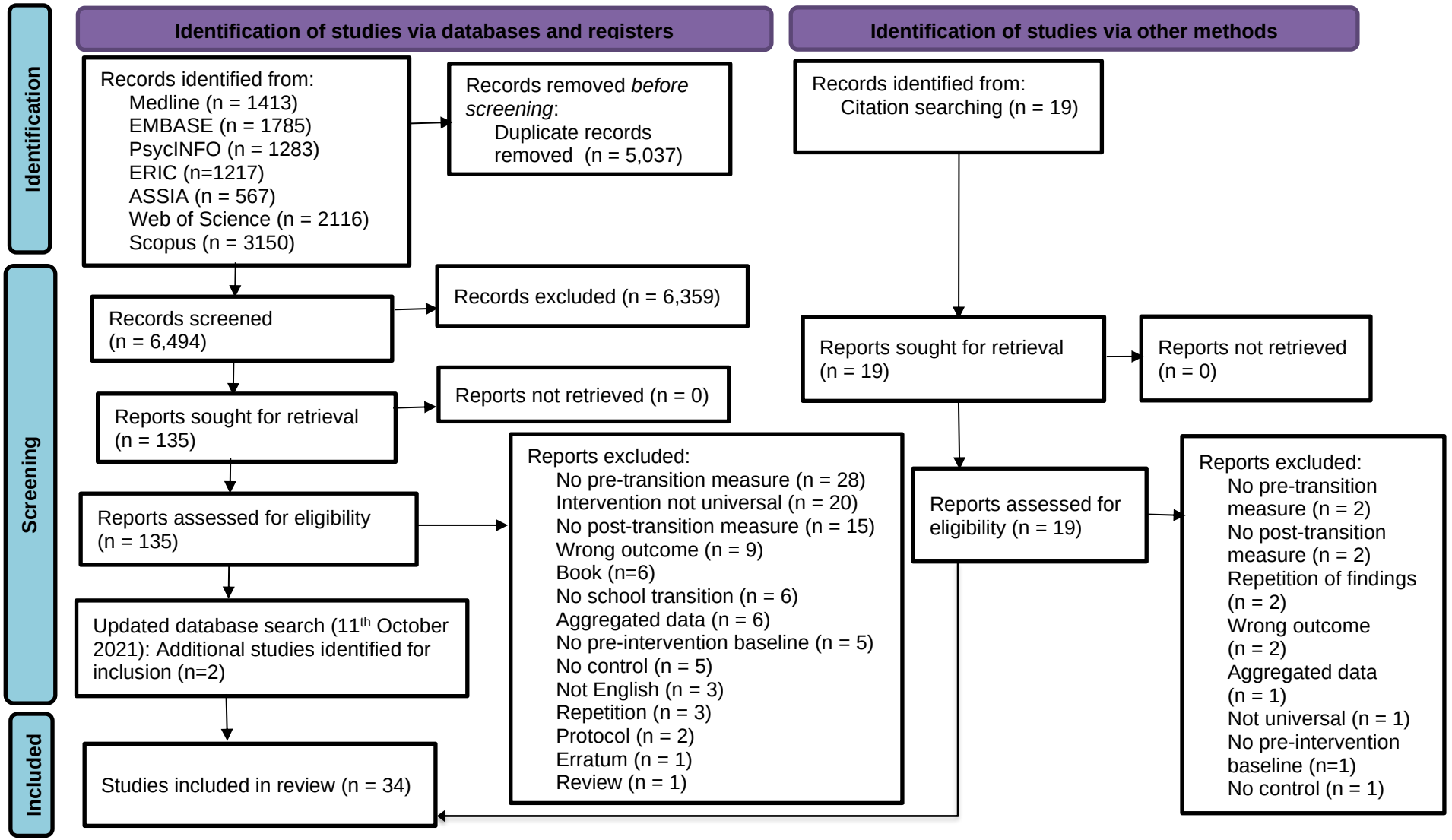

Figure 9.1: PRISMA flowchart of study identification, screening and inclusion criteria

9.1.6 Study risk of bias assessment

Quality assessment was initially attempted using the Cardiff University SURE systematic review critical appraisal checklist in line with the review protocol (Specialist Unit for Review Evidence 2018). However, it was not possible to reach consensus between the two reviewers over the overall quality rating for each study. Therefore, the Cochrane Rob2 tool, which had been launched since the development and publication of the protocol, was used instead. The tool includes five domains for RCTs (six for cluster RCTs) that can be used to assess levels of bias (Sterne et al. 2019). Each domain contains an algorithm based on a series of questions, and the overall rating is based on the highest level of bias in any of the domains. The domains are: bias arising from the randomization process; bias due to deviations from intended interventions; bias due to missing outcome data; bias in measurement of the outcome; bias in selection of the reported result, and for cluster RCTs only, bias arising from the timing of identification or recruitment of participants in a cluster-randomized trial. All domains were assessed for the study as a whole, except for in the case of the fourth domain which assesses bias in the measurement of the outcome, where due to differences in how outcomes were assessed, risk of bias was assessed for each outcome separately (Figure 9.2).

9.1.7 Study categorisation

Studies were categorised in three ways. Firstly, by type of transition: pre-school to school; school to school; and school to post-compulsory education. Secondly, by length of follow up period: immediate effects (follow up <6 months post-intervention), intermediate effects (follow up approximately one year post-intervention) and sustained effects (follow up approximately two or more years post-intervention). For most papers the post-intervention follow up timescales are very similar to the length of time post-transition. This differs only for Hoglund et al. (2012) and Kellam et al. (1994; 1998), where the interventions took place several years before transition. Due to lack of transparency in some papers, time scales are best estimates based on the information provided. Thirdly, studies were categorized by type of intervention. This includes studies with a teacher development component (labeled ‘1’), studies with a parent development component (labeled ‘2’) and those containing ‘other’ activities that were not

mediated via teachers or parents (labeled ‘3’). This frequently involved other adults, external to the school or home, facilitating activities directly with the children (including researchers). Studies may have one or more of these components. Within each study, outcomes were categorized as behavioral (including conduct/behavioral problems, aggressive behavior and externalizing difficulties), emotional/ psychological (including happiness, worry, internalizing behavior, self-esteem, stress and loneliness), social (including social competence, perceived social support, peer problems and prosocial behavior) or, where the measure was a combination of these categories, for example, containing both psychological and social components, the outcome was categorized as ‘mixed’.

9.1.8 Synthesis of findings

Due to the heterogeneity in outcome measures and in measures of effect, effect direction plots were produced to present intervention effect. In line with recent guidance from Cochrane (Higgins et al., 2021) plots were not based on significance of p-values due to the possibility of underpowered studies being unnecessarily excluded. Firstly, effect directions were calculated for each outcome in each study. Thomson and Thomas (2013) propose that where 70% of outcomes within a study report the same direction of effect, this direction should be reported. Where fewer than 70% of outcomes report the same direction of effect, the results should be stated to be conflicting. The following symbols were used for each paper:

▲ Effect direction favors intervention; ▼ Effect direction favors control
◄► Effect direction inconsistent or no effect;
O Insufficient data provided to establish effect direction

Study	D1	D1b	D2	D3	D4			D5	Overall
Bierman et al (2014) [Parent-reported social competence]					1				
Bierman et al (2014) [All other measures]					6				
Bierman et al (2015)					2				
Bierman et al (2017) [REDI-C intervention]					2	2			
Bierman et al (2017) [REDI-P intervention]					2	2			
Bierman et al (2018)					1	1			
Bierman et al (2019)					1	1			
Bierman et al (2021a)					3				
Bierman et al (2021b)					1	1			
Bronstein et al (1998) [Immediate follow up]					3				
Bronstein et al (1998) [Intermediate follow up]					1	2			
Brotman et al (2016)					1				
Coelho et al (2017)					3				
Coelho et al (2018)					3				
Dawson-McClure et al (2015)					1				
Hoglund et al (2012)					1	2			
Kellam et al (1994)					1				
Kellam et al (1998)					1				
Lamothe et al (1995)					1				
Li et al (2012)					4				
Lochman et al (2002)					9				
Mantzicopoulos (2004)					2				
Mason et al (2016a) [CSP and CSP Plus; intermediate follow ups]					5				
Mason et al (2016a) [CSP and CSP Plus; sustained follow ups]					5				
Mattanah et al (2010)					2				
McCoy et al (2018)					3				
Morris et al (2010)					3				
Nix et al (2013)					1				
Pratt et al (2000)					4				
Quinn et al (2019) [Standard and Reconstructed interventions]					2				
Shure and Spivack (1982)					1	2			

Vuori et al (2008)					1				
Watts et al (2018)					2				
Webster-Stratton et al (1998)					3	2	6		
Webster-Stratton et al (2001)					1				
Welsh et al (2020)					2				
Yoshikawa et al (2015)					1				
Zhai et al (2012)					2				

Figure 9.2: Risk of bias assessment for each domain. Domains: D1: Bias arising from the randomisation process; D1b: Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation (Cluster RCTs only); D2: Bias due to deviations from intended intervention; D3: Bias due to missing outcome data; D4: Bias in measurement of reported outcome (assessed for each outcome, numbers highlight how many outcomes in each study were rated at each bias level); D5: Bias in selection of the reported result. Green = low risk; yellow = some concerns; red = high risk; grey = not applicable.

The number of assessment measures representing that direction of effect are stated alongside the symbol. Where the insufficient data symbol has been used, this intervention is not included in the denominator in later discussions about proportion of effect directions in a positive or negative direction. The template provided in Boon and Thomson (2021) was used to create an effect direction plot, including the risk of bias assessment.

9.2 Results

Twenty-four interventions were represented by the 34 included papers. Several of the interventions had multiple papers relating to them, generally by the same authors or research group, but with different follow up periods or outcomes being assessed. Characteristics of the 34 included studies are presented in Table 9.1, ordered first by transition type and then by follow up period. Tables 9.2, 9.3 and 9.4 provide effect direction plots for each of the interventions, including the types of outcomes included in each intervention and the risk of bias assessment. Almost all interventions received a risk of bias assessment of high, largely due to missing information and/or the difficulties of blinding outcome assessors in these types of interventions. Due to lack of power, sign tests (Boon and Thomson 2021) have not been carried out.

9.2.1 RQ5: What are the characteristics of effective school transition interventions?

In order to answer this question comprehensively, it was broken down into four sub-questions.

9.2.1.1 RQ5(i): Is there evidence that universal interventions, or those focused on young people with low socioeconomic status, are effective in supporting mental health across normative school transitions?

- Pre-school to primary school interventions

This group of papers (n=21) represented 11 different interventions. All involved children entering school for the first time from a nursery or pre-kindergarten

environment at approximately four years of age. Most interventions were based in the USA (n=9; 82%) and aimed at low SES families (n=9; 82%). All interventions had a pre-transition component, and five continued post-transition. Interventions were varied in length and scope. Li et al. (2012) focused on preparing children for their new school; over a four week period children visited their new school, learned how to organise their school bags and participated in a play-based programme to build problem solving, interpersonal and coping skills.

Yoshikawa et al. (2015) presented a much more extensive intervention lasting for two years within the school setting involving workshops and in class coaching for teachers in child oral and literacy development, socioemotional development and coordinating education with health services. Six of the 11 interventions (55%) included a component targeting parents - for example, the REDI-P program (Bierman et al. 2015; Bierman et al. 2017; Bierman et al. 2018; Bierman et al. 2019; Bierman et al. 2021b) which had children participating in the primarily classroom-focused REDI-C intervention as its control group, involved providing parents with learning materials alongside home visits - and nine out of the 11 (82%) included a component aimed at teachers.

Five involved direct interaction with the children from other adults, including research assistants, community volunteers and mental health professionals. For two of the interventions that offered support from mental health professionals, this was a targeted add-on component only for children requiring additional support - the Chicago School Readiness Project (Zhai et al. 2012; McCoy et al. 2018; Watts et al. 2018) and Foundations of Learning (Morris et al. 2010). Follow up time points ranged from six weeks after the intervention (Li et al., 2012) to 10-11 years later (Watts et al. 2018). Most interventions (n=10; 91%) had at least an intermediate follow up period, and four (36%) also had a sustained follow up. For behavioral outcomes, results were mixed and there is no clear relationship between timing of intervention or intervention type, and direction of effects. For all follow up timescales, there were no negative effect directions (two were conflicting, the remainder were positive). The sustained follow up periods were also broadly positive for all reported outcome types, with just one conflicting effect direction.

Study/Intervention	Transition Type	Country	Intervention Type	Follow Up Period	Timing of Intervention	Length of Intervention	Targeting Low SES Families
Li et al. (2012)	Pre-school to school	Hong Kong	3	Immediate	Pre-transition	4 weeks	No
Head Start Public School Transition (Mantzicopoulos 2004)	Pre-school to school	USA	1,3	Intermediate	Pre and post transition	1 school year	Yes
Chicago School Readiness Project (Zhai et al. 2012; McCoy et al. 2018; Watts et al. 2018)	Pre-school to school	USA	1,3	Intermediate, Sustained	Pre-transition	1 school year	Yes
Foundations of Learning (Morris et al. 2010)	Pre-school to school	USA	1,3	Intermediate	Pre-transition	1 school year	Yes
Incredible Years (Webster-Stratton et al. 2001)	Pre-school to school	USA	1,2	Intermediate	Pre-transition	6 months	Yes
Parent Corps (Dawson-McClure et al. 2015; Brotman et al. 2016)	Pre-school to school	USA	1,2,3	Intermediate, Sustained	Pre and post transition	13 weeks plus	Yes
PARTNERS (Webster-Stratton 1998)	Pre-school to school	USA	1,2	Intermediate	Pre-transition	6 months	Yes
REDI-C (Nix et al. 2013; Bierman et al. 2014; Bierman et al. 2017; Welsh et al. 2020; Bierman et al. 2021a)	Pre-school to school	USA	1,2	Intermediate, Sustained	Pre-transition	1 school year	Yes
REDI-P (Bierman et al. 2015; Bierman et al. 2017; Bierman et al. 2018; Bierman et al. 2019; Bierman et al. 2021b)	Pre-school to school	USA	2	Intermediate, Sustained	Pre and post transition	2 years	Yes
Shure & Spivack (1982)	Pre-school to school	USA	1	Intermediate	Pre and post transition	Up to 2 years	N/A
Un Buen Comienzo/A Good Start (Yoshikawa et al. 2015)	Pre-school to school	Chile	1	Intermediate	Pre and post transition	2 years	Yes
Aware Parenting (Bronstein et al. 1998)	School to school	USA	2	Immediate, Intermediate	Post-transition	11 weeks	Yes
Coping Power Program (Lochman and Wells 2002)	School to school	USA	1,2,3	Immediate	Pre and post transition	16 months	No
Positive transition (Coelho et al., 2017; Coelho et al., 2018)	School to school	Portugal	3	Immediate	Pre and post transition	2 years	No

Common Sense Parenting (Mason et al. 2016a)	School to school	USA	2	Intermediate	Pre-transition	6 weeks	Yes
Common Sense Parenting Plus (Mason et al. 2016a)	School to school	USA	2,3	Intermediate	Pre-transition	8 weeks	Yes
Good behavior game (Kellam et al., 1994; Kellam et al., 1998)	School to school	USA	1	Sustained	Pre-transition	2 years	No
WITS (Hoglund et al. 2012)	School to school	Canada	1,3	Sustained	Pre-transition	3 years	No
Lamothe et al. (1995)	School to post-compulsory education	Canada	3	Immediate	Post-transition	6 weeks	No
Mattanah et al. (2010)	School to post-compulsory education	USA	3	Immediate	Post-transition	9 weeks	No
Pratt et al. (2000)	School to post-compulsory education	Canada	3	Immediate	Post-transition	9 weeks	No
Red Frogs - standard intervention (Quinn et al. 2019)	School to post-compulsory education	Australia	3	Immediate	Pre-transition	1-1.5 hours	No
Red Frogs - reconstructed intervention (Quinn et al. 2019)	School to post-compulsory education	Australia	3	Immediate	Pre-transition	1-1.5 hours	No
Towards Working Life (Vuori et al. 2008)	School to post-compulsory education	Finland	3	Intermediate	Pre-transition	15 hours	No

Table 9.1: Intervention and study characteristics, ordered by transition type. Intervention type (1 = teacher component; 2 = parent component; 3 = other activities, not mediated by teachers or parents). Follow-up period (immediate <6 months post-intervention; intermediate ~ one year post-intervention; sustained ~ two or more years post-intervention).

Pre-School to School Transition Interventions	Study Design	Intervention Type	Follow Up Period	Behavioral	Emotional/ Psychological	Social	Mixed	Risk of Bias (RoB2)
Li et al. (2012)	RCT	3	Immediate		▲2	◄►1	▲1	HIGH
Chicago School Readiness Project (Zhai et al. 2012)	Cluster RCT	1,3	Intermediate	O1	O1			SOME CONCERNS
REDI-C (Bierman et al., 2014 - parent-reported social competence only; Nix et al., 2013)	Cluster RCT	1,2	Intermediate			▲1	▲1	HIGH
REDI-C (Bierman et al., 2014 - all other measures)	Cluster RCT	1,2	Intermediate	▲2		▲2	▲1	SOME CONCERNS
REDI-P (Bierman et al. 2015)	RCT	2	Intermediate	▼1		▲1		SOME CONCERNS
Head Start Public School Transition (Mantzicopoulos 2004)	Cluster RCT	1,3	Intermediate	▼1		▲1		HIGH
Foundations of Learning (Morris et al. 2010)	Cluster RCT	1,3	Intermediate	▼1	▼1	▲1		HIGH
Incredible Years (Webster-Stratton et al. 2001)	Cluster RCT	1,2	Intermediate	▲1				HIGH
Parent Corps (Dawson-McClure et al. 2015)	Cluster RCT	1,2,3	Intermediate	▼1				HIGH
PARTNERS (Webster-Stratton 1998)	Cluster RCT	1,2	Intermediate	▲5	▲1	▲2	▲3	HIGH
Shure & Spivack (1982)	Non-Randomized	1	Intermediate	▲1		▲2		HIGH
Un Buen Comienzo/A Good Start (Yoshikawa et al. 2015)	Cluster RCT	1	Intermediate	▲1				HIGH
Chicago School Readiness Project (McCoy et al. 2018; Watts et al. 2018)	Cluster RCT	1,3	Sustained	▲1	▲1		◄►3	SOME CONCERNS
REDI-C (Bierman et al. 2017; Welsh et al. 2020; Bierman et al. 2021a)	Cluster RCT	1,2	Sustained	▲2	▲1	▲6		SOME CONCERNS
REDI-P (Bierman et al. 2017; Bierman et al. 2018; Bierman et al. 2019; Bierman et al. 2021b)	RCT	2	Sustained			▲7	▲3	SOME CONCERNS
Parent Corps (Brotman et al. 2016)	Cluster RCT	1,2,3	Sustained				▲1	HIGH

Table 9.2: Pre-school to school transition: effect direction plot of behavioral, emotional/psychological and social outcomes, ordered by follow up period. Effect direction: upward arrow ▲= positive health impact, downward arrow ▼= negative health impact, sideways arrow ◄►= no change/mixed effects/conflicting findings, ⭘ insufficient data provided. Number next to symbol indicates number of measures used to determine the effect direction. Sample size: Final sample size (individuals) in intervention group Large arrow ▲ >300; medium arrow ▲ 50-300; small arrow ▲ <50. Intervention type (1 = teacher component; 2 = parent component; 3 = other activities, not mediated by teachers or parents). Follow-up period (immediate <6 months post-intervention; intermediate ~ one year post-intervention; sustained ~ two or more years post-intervention). RCT = randomised control trial

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School to school transition interventions	Study Design	Intervention type	Follow up period	Behavioral	Emotional/ psychological	Social	Mixed	Risk of Bias (RoB2)
Aware Parenting (Bronstein et al. 1998)	RCT	2	Immediate	▲1	◄►2			HIGH
Coping Power Program (Lochman and Wells 2002)	Cluster RCT	1,2,3	Immediate	▲3		▲5		HIGH
Positive transition (Coelho et al. 2017; Coelho et al. 2018)	Cluster RCT	3	Immediate		▲6			HIGH
Aware Parenting (Bronstein et al. 1998)	RCT	2	Intermediate	▲1	◄►2			HIGH
Common Sense Parenting (Mason et al. 2016a)	RCT	2	Intermediate	▼3		▼2		HIGH
Common Sense Parenting Plus (Mason et al. 2016a)	RCT	2,3	Intermediate	▼3		▲2		HIGH
Common Sense Parenting (Mason et al. 2016a)	RCT	2	Sustained	▼3		▼2		SOME CONCERNS
Common Sense Parenting Plus (Mason et al. 2016a)	RCT	2,3	Sustained	◄►3		◄►2		SOME CONCERNS
Good behavior game (Kellam et al., 1994; Kellam et al., 1998)	Cluster RCT	1	Sustained	O2				HIGH
WITS (Hoglund et al. 2012)	Non-Randomized	1,3	Sustained	▲1	▲1	▲1		HIGH

Table 9.3: School to school transition: effect direction plot of behavioral, emotional/psychological and social outcomes, ordered by follow up period. Effect direction: upward arrow ▲= positive health impact, downward arrow ▼= negative health impact, sideways arrow ◄►= no change/mixed effects/conflicting findings, O insufficient data provided. Number next to symbol indicates number of measures used to determine the effect direction. Sample size: Final sample size (individuals) in intervention group Large arrow ▲ >300; medium arrow ▲ 50-300; small arrow ▲ <50. Intervention type (1 = teacher component; 2 = parent component; 3 = other activities, not mediated by teachers or parents). Follow-up period (immediate <6 months post-intervention; intermediate ~ one year post-intervention; sustained ~ two or more years post-intervention). RCT = randomised control trial

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School to post-compulsory education interventions	Study Design		Follow up period	Behavior	Emotional/ psychological	Social	Mixed	Risk of Bias (RoB2)
Lamothe et al., (1995)	RCT	3	Immediate			▲1		HIGH
Mattanah et al. (2010)	RCT	3	Immediate		▲1	▲1		HIGH
Pratt et al. (2000)	RCT	3	Immediate		O1	O1		HIGH
Red Frogs - standard intervention (Quinn et al. 2019)	RCT	3	Immediate		▲1			HIGH
Red Frogs - reconstructed intervention (Quinn et al. 2019)	RCT	3	Immediate		▲1			HIGH
Towards Working Life (Vuori et al, 2008)	RCT	3	Intermediate		▼1			HIGH

Table 9.4: School to post-compulsory education transition: effect direction plot of behavioral, emotional/psychological and social outcomes, ordered by follow up period. Effect direction: upward arrow ▲= positive health impact, downward arrow ▼= negative health impact, sideways arrow ◄►= no change/mixed effects/conflicting findings, O insufficient data provided. Number next to symbol indicates number of measures used to determine the effect direction. Sample size: Final sample size (individuals) in intervention group Large arrow ▲ >300; medium arrow ▲ 50-300; small arrow ▲ <50. Intervention type (1 = teacher component; 2 = parent component; 3 = other activities, not mediated by teachers or parents). Follow-up period (immediate <6 months post-intervention; intermediate ~ one year post-intervention; sustained ~ two or more years post-intervention). RCT = randomised control trial.

- School to school transition interventions

The eight included papers represented seven separate interventions. Four interventions (57%) involved transitions from elementary to middle school at approximately age 11 (Bronstein et al., 1998; Hoglund et al., 2012; Kellam et al., 1994; Kellam et al., 1998; Lochman & Wells, 2002); one included an elementary to middle school transition at age 9 (Coelho et al., 2017; Coelho et al., 2018) and two included a middle to high school transition at age 14 (Mason et al. 2016a).

Six of the interventions (86%) had a pre-transition component, and one was solely post-transition. Two interventions (29%) - Coping Power Program (Lochman & Wells, 2002) and Positive Transition (Coelho et al., 2017; Coelho et al., 2018) - had pre- and post-transition components. The latter, which look place over a two year period, included 20*50-min sessions conducted by an educational psychologist. Pre-transition these explored expectations of their the new school, analysis of schedule and evaluation sheets, two sessions conducted by former school colleagues who had already transitioned, and a visit to the middle school. Post-transition, focus was on coping skills and analysing difficulties experienced at transition. Coping Power had substance misuse as a distal outcome that it aimed to mediate via reductions in aggression (Lochman and Wells 2002).

Interventions ranged from relatively short in duration - 6-8 weeks for Common Sense Parenting (Mason et al. 2016a) - to WITS which spanned three academic years (Hoglund et al. 2012). WITS was an anti-bullying intervention that provided curricula and online training for teachers, and involved community members, including police officers, emergency service personnel and university athletes, alongside developmental psychologists. Three interventions (43%) aimed to influence teacher behavior change as a means to influence child mental health outcomes, and four (57%) aimed to help parents to support positive transition. The Coping Power intervention, for example, which had both parent and teacher components included five two-hour teacher training sessions based on identified predictors of substance misuse, including promoting parental involvement in school life and enhancing children’s self-regulation, alongside parent meetings addressing issues relating to their child’s success in school, peer relationships and concerns about the transition to middle school. Of the three interventions with

immediate follow up, all behavioral, emotional and social effect directions were positive except for one which was inconclusive. For the intermediate and sustained follow ups, the effect directions for the Common Sense Parenting (CSP) and CSP-Plus interventions (Mason et al. 2016a) tended to be more negative than those of the other interventions. Overall the pattern seems to show consistent evidence of some immediate effect in the hoped for direction, but less consistent evidence of lasting effect.

- Transition to post-compulsory education

Five papers were included in this section and consisted of six interventions. One intervention was for transition from high school to college at age 16 (Vuori et al. 2008) and five (83%) from school to university at age 18. Lamothe et al. (1995), Pratt et al. (2000) and Mattanah et al. (2010) all focused on post-transition interventions based in universities and aimed to increase adolescent social support in order reduce loneliness and increase mental wellbeing. Mattanah et al. (2010) which built on Pratt et al. (2000), included nine weekly peer-led social support groups in the first year of college with discussions on topics related to transition including creating new social ties, peer pressure and residential issues. Of these interventions, two were in Canada and one in the USA. Quinn et al. (2019) include two (very similar) interventions based in Australian secondary schools. Their primary aim was to target alcohol use and risky party behavior (such as drug misuse) following school graduation and entry into university. The first intervention was a brief training session on safe partying behaviours, including alcohol harm reduction strategies, mental health and wellbeing tips and the second included similar content but was delivered through a trivia format, informed by social cognitive principles and offered a safe drinking mobile app. Vuori et al. (2008) focused on building career efficacy as young people were leaving Finnish basic education and having to choose vocational or other colleges. It was hypothesized that feeling more in control of their career path would also help reduce depression.

None of these interventions had a teacher or parent component. All of these interventions were quite short (ranging from 1.5 hours to nine weeks) and none were aimed at young people from low SES families. None of the interventions

were delivered both sides of transition, with three (50%) delivered pre-transition, and three post. For this transition, almost all interventions (n=5; 83%) had immediate follow up periods (none had sustained follow up). Of the four interventions with effect directions available for emotional outcomes, three (75%) had positive effect directions, and of the two with effect directions available for social outcomes, both were positive.

9.2.1.2 RQ5(ii): Is there evidence of difference in the effectiveness of transition interventions according to their characteristics?

All studies of interventions using at least a parent and teacher component - coded 1, 2 or 1, 2, 3 in Tables 2-4 reported positive overall effect directions, with the exception of intermediate behavioral outcomes in the Parent Corps intervention (Dawson-McClure et al. 2015) which was a school-based intervention providing professional development for teachers in pre-kindergarten and kindergarten on effective behaviour management and positive behaviour support, 13 weekly two-hour sessions for parents and concurrent sessions for pre-kindergarten students led by mental health professionals. However, the findings are too mixed to dismiss or advocate for any intervention type, with many of those with just one intervention component also reporting point estimates in the direction of a positive effect, particularly for school to university transitions. Across all transition types, immediate outcomes were relatively positive overall, particularly for emotional/psychological measures, of which five out of six interventions (83%) reported positive overall effect directions, and for social outcomes, of which four out of five (80%) overall effect directions were positive. For intermediate follow up, effect directions were more favorable for social outcomes (7/8; 88% are positive) than behavioral (6/12; 50%) or emotional (1/4; 25%). Within the sustained follow up category, most effect directions were positive for the pre-school to school transition - 2/2 (100%) for behavioral outcomes; 2/2 (100%) for emotional outcomes; 2/2 (100%) for social outcomes and 2/3 (67%) for mixed outcomes. Sustained outcomes for school to school transitions were less favorable, with 1/4 (25%) effect directions positive for behavioral outcomes; 1/1 (100%) positive for emotional outcomes and 1/3 (33%) for social outcomes.

Across all transition types, very few interventions included in the review were delivered solely post-transition (n=4; 17%) and there is no clear trend that interventions that run across the transition were more effective than those that were solely pre-transition. There is no clear pattern of effectiveness based on whether interventions were targeted at low SES families or not, although some of the larger interventions, in particular REDI-C and REDI-P (Nix et al. 2013; Bierman et al. 2014; Bierman et al. 2015; Bierman et al. 2017; Bierman et al. 2019; Welsh et al. 2020; Bierman et al. 2021a; Bierman et al. 2021b), did have positive effect direction estimates across the preschool to school transition for this population. In terms of bias assessment, the larger more extensive interventions also tended to be those more likely to receive a 'some concerns' rather than 'high' assessment, and there does appear to be a trend that these better quality interventions are more likely to report positive effect estimates.

9.2.1.3 RQ5(iii): How do characteristics of interventions differ by type of school transition?

As children got older, there tended to be a shift from parenting and teacher focused interventions towards those that involved direct interaction with young people and did not rely on behavior change of parents or teachers to mediate a shift in young people's outcomes. Pre-school to school interventions were heavily focused on teacher behavior and moderating the school environment (9/11 interventions; 82%) alongside parenting (5/11; 45%) and child (5/11; 45%) components. The proportion of interventions with a teacher focus had decreased by the primary to secondary transition (3/7; 43%) but more than half of interventions had a parent component (4/7; 57%) and/or a child component (4/7; 57%). By the school to post-compulsory education transition none of the interventions offered parent or teacher components and all focused directly on the adolescent. There was also a shift from focusing on behavioral outcomes at the early transition to more of a focus on psychological outcomes as children age. All but one (91%) of the interventions at the pre-school to school transition included a behavioral outcome and the majority of interventions (64%) included a social outcome, however only five of the eleven studies (45%) included emotional or psychological outcomes for this age group. For school-to-school transitions, there

remained a clear focus on behavioral outcomes, with all interventions bar one (86%) including them as an outcome. Social outcomes were assessed in three of the seven interventions (43%), as were emotional outcomes (43%). At the school to post-compulsory education transition there were no behavioral or mixed outcomes, but five out of six interventions (83%) included emotional/psychological outcomes and three out of six (50%) included social outcomes. Overall, half of interventions were aimed at families with low SES (12/24). This included nearly all pre-school to school transition interventions, but none of the school to university interventions.

9.2.1.4 RQ5(iv): Is there evidence that gender, socio-economic status (SES) or geography (high/low income countries) moderates the impact of transition interventions?

Many of the studies, particularly those from pre-school to school (9/11; 82%) and school to school (3/7; 43%) were directly aimed at low SES families, and therefore don't test for this moderation effect separately due to the lack of higher SES families for comparison. Findings for this question are therefore limited by the data available. Only four studies (Kellam et al. 1998; Hoglund et al. 2012; Mason et al. 2016a; Watts et al. 2018) looked at SES as a moderator of intervention impact, although (Mason et al. 2016a) does not report findings due to inconsistent results across interaction effects. Kellam et al. (1998) found that the intervention had the biggest impact on boys with high initial aggression who were also in a high poverty classroom. Hoglund et al. (2012) found an acceleration in aggression in high poverty intervention schools but a deceleration in low poverty intervention schools. Effect direction data from Watts et al. (2018) suggests lower intervention effectiveness to reduce both internalizing and externalizing behaviors in students from poorer families. Therefore, while Kellam et al. (1998) suggest that transition interventions can be inequality reducing, in both of the latter two studies there is evidence that transition interventions may introduce intervention-generated inequalities.

There is insufficient information given in the papers in this review to understand exactly how the term 'gender' and 'sex' were conceptualized and measured, and there are likely to be differences between papers. The following section will use

the terms as used in the original papers, while acknowledging this may not conform to current American Psychological Association (APA) guidelines (APA 2020). Nine interventions (38%) included subgroup analyses. Only one of them (Dawson-McClure et al. 2015) solely used the term ‘sex’, and found that for boys with high conduct problem scores at baseline, the intervention "normalized" their level of conduct problems to those with low baseline scores, but there was no such effect on girls. The remaining eight interventions used the term ‘gender’. At entry to school, Mantzicopoulos (2004) found no evidence of differential effects by gender. Watts et al. (2018) found that even after controlling for treatment condition and gender, there was an interaction between gender and treatment that resulted in girls having marginally higher internalizing symptoms than boys, and boys higher externalizing symptoms than girls. In the school to school interventions, Hoglund et al. (2012) and Mason et al. (2016a) found no evidence of gender differences in outcomes due to intervention. Coelho et al. (2017) found that girls in the intervention group tended to have more favorable scores than boys in two of the four psychological wellbeing measures (and lower in the other two), while, for the same intervention, Coelho et al. (2018) found marginally more favorable scores for intervention boys in two of the three psychological wellbeing measures (and lower in one), suggesting little evidence of an intervention gradient. Both Kellam et al. (1994) and Kellam et al. (1998) found the strongest intervention effects for the most aggressive boys while there was little effect for less aggressive boys, or girls. In the post-compulsory education transition interventions, Mattanah et al. (2010) found no differential intervention effects by gender, while Pratt et al. (2000) found that the intervention was more effective at building social support and reducing depression for women compared to controls, than for men.

It wasn’t possible to test for geography as a moderator as none of the interventions took place in low-income countries.

9.2.2 RQ6: What are the theories of change that mental health transition interventions draw upon?

All of the papers began with a broad discussion of theory, for example, both Li et al. (2012) and Coelho et al. (2018) discuss Lazarus and Folkman’s (1984) theory

of cognitive appraisal as a means of placing their interventions within the stress and coping literature; Kellam et al. (1998) states that the Good Behavior Game intervention was “guided by life course/social field theory” (p.167); and Hoglund et al. (2012) situates the research within ecological systems theory (Bronfenbrenner 1979). Other papers, despite citing a range of theories within their introductions, are less specific about the exact theoretical basis of their intervention: Raver et al. (2009) discussing the Chicago School Readiness intervention, for example, states that the intervention is “based on several theoretical models of preschool children’s behavioral problems in early educational settings” (p.303).

Few papers had explicit discussion of the intervention’s theory of change, with exceptions being Morris et al. (2010), Hoglund et al. (2012), Nix et al. (2013) and Mason et al. (2016a). Additional details about the theory of change for Mason et al. (2016a) were available in Mason et al. (2016b). Of these, Morris et al. (2010) stated that all changes in child behavior would be mediated via improvements in classroom management skills and quality of instruction. Nix et al. (2013), through the REDI-C teacher-focused intervention, tested a number of possible mediators of positive child social behavior in kindergarten and found that the strongest mediator was change in positive social behavior in preschool. In Hoglund et al. (2012), the theory of change viewed reduction in child victimization as emerging directly from enhanced adult responsiveness and indirectly via building child resolution skills and social competencies. Finally, Mason et al. (2016b) includes clear proximal targets for both parents (parenting skills) and children (self-control and emotion regulation skills) which are viewed as mediating distal outcomes, including child conduct problems.

For studies without clear theories of change, possible mechanisms of change could be inferred from the text and nature of the interventions. Many interventions appeared to view classroom environment as a key mediator of child outcomes (Webster-Stratton 1998; Webster-Stratton et al. 2001; Dawson-McClure et al. 2015; Yoshikawa et al. 2015; Brotman et al. 2016) and others viewed parenting skills as a key mechanism influencing child outcomes (Bronstein et al. 1998; Webster-Stratton 1998; Webster-stratton et al. 2001; Lochman and Wells 2002; Bierman et al. 2015; Dawson-McClure et al. 2015; Mason et al. 2016a; Bierman et al. 2017; Bierman et al. 2018; Bierman et al. 2019; Bierman et al. 2021b).

At the pre-school to school and school-school transitions, interventions frequently (13/18; 72%) focused on child socio-emotional skills, aiming to improve coping behaviors and self-regulation as a means to support behavioral and emotional outcomes. Two interventions sought to improve mental health outcomes in order to target substance misuse (Lochman and Wells 2002; Quinn et al. 2019). For older adolescents, increasing social support and the skills needed to access support from others was frequently viewed as a mediator of emotional and psychological outcomes (Lamothe et al. 1995; Pratt et al. 2000; Vuori et al. 2008; Mattanah et al. 2010; Hoglund et al. 2012)

9.3 Summary and conclusion

Educational transitions can be important turning points in the lives of young people, and for those young people who experience a poor transition, this can influence their health trajectories for the rest of their lives. Intervening to improve transition experiences can support young people, particularly those at risk of poor transition, and prevent them from disengaging from academic life and support their mental health. School and home ecological levels are frequent targets of transition interventions, supporting evidence of the importance of both to child mental health. Social and psychological outcomes appear likely to be more easily modified than behavioural outcomes through transition interventions. As children age there is also a clear shift in the focus of interventions away from behavioural outcomes and particularly at the university level, a shift away from influencing institutional culture. The next chapter will discuss the findings from all of the study chapters, and consider potential directions for future research as well as policy implications.

10. Discussion

Every human body tells a story of life experiences within a unique social, historical and ecological context (Krieger 2021). Each child who shared their personal data in this thesis was sharing the story of their own embodied truths, a story than began before conception and will continue until their life ends. In this embodiment is evidence of social injustice, shaped by history, culture and power structures, and this thesis has sought to provide evidence of these embodied injustices by considering some of the factors that affect young people's mental health as they transition from primary to secondary school. The process of transition itself has also not been considered benign in this regard, but as an exposure that may further exacerbate these injustices by placing greater psychological burden on those young people least able to cope with it. The pathways to embodiment of injustice speak of power inequalities - socio-economic status; gender; special educational needs - that operate at a societal level and are reinforced and replicated at school level. Thus school culture itself may perpetuate mental health inequalities, and interventions that seek to make transition less problematic for young people also risk perpetuating inequality by focusing their energies on the dominant group within a school and overlooking those with greatest need. This chapter will discuss the findings from each of the empirical analyses and synthesise them in light of ecosocial theory, to provide a detailed account of young people's experiences of school transition and their embodied mental health.

10.1 Study one: Trajectories of mental health across the primary to secondary transition and individual-level predictors of class membership

Study one (chapter six) used parallel process latent class growth analysis (LCGA) and identified four mental health trajectory classes across the primary to secondary school transition in young people from the South East of England in 2012-3. Using trajectory analysis places mental health within the life course, and reflects the fact that embodiment of mental health occurs over time within a social, political and ecological context (Krieger 2011). The majority of young

people (54%) were situated within the ‘low and stable’ grouping, where emotional, conduct, hyperactivity and peer problems were low prior to transition and remained low across transition and into secondary school. This grouping, or class, was set as the reference class against which the others were compared.

The second largest grouping (23% of students) consisted of young people experiencing moderately high levels of hyperactivity and conduct problems, but with few emotional health or peer difficulties, with scores for the latter two measures decreasing over the transition period. Relative to the reference class, this group had significantly higher odds of being male, having low socioeconomic status, having SEN and having experienced two or more negative life events prior to transition, for example, death of a parent or sibling, doing badly at school or a close friend moving away. They were not however significantly more likely to be worried about transition.

The third grouping was of students (15%) characterised by high and increasing emotional problems, moderate and increasing hyperactivity, and moderate, stable peer problems, alongside relatively low levels of conduct problems. This group was significantly more likely to be female, to have experienced two or more negative life events prior to transition and to be worried about transition. They were not significantly more likely to have low socioeconomic status or special educational needs (although the relationship was in the expected direction).

Finally, the smallest, but perhaps most concerning group (9% of children) consisted of young people with high scores for all four outcomes both before and after transition, with conduct problems significantly increasing over time. This finding is similar to the estimate of children with potentially clinically significant emotional difficulties and behavioural difficulties found by Moore et al. (2021). This group was significantly more likely than the reference class to be male, to have low socioeconomic status, special educational needs, to have experienced two or more negative life events and to be worried about secondary school. Notably there were no trajectories that were low and increasing, highlighting that the burden of increasing mental health problems was among those young people who were already in poor mental health prior to transition.

This analysis adds to previous work looking at how child mental health trajectories can be categorised, many of which have solely looked at one mental health outcome, for example, Fanti and Henrich (2010) and Papachristou and Flouri (2020). Two key studies have modelled multiple mental health outcomes in parallel. Shi and Ettekal (2021) identified four parallel trajectory classes of internalising and externalising behaviours in children assessed from age 6-17, assessed using the SDQ: chronic co-occurring; moderate co-occurring; pure externalising; low risk. McCoy et al. (2018) modelled four mental health outcomes in parallel: internalising problems, externalising problems, attention problems and social problems and also extracted four classes (early recovery; late recovery; increasing attention and externalising problems; low and stable). Data were collected during the pre-school year and then in kindergarten, third grade and fifth grade. It is therefore consistent with previous studies that four classes have been extracted, although the classes are not exactly the same in form. This may be a reflection of context as the previous parallel process studies have been based on US data rather than from the UK, and may also be a reflection of the different ages of the children involved. However, despite some differences there are common themes of a low, stable category, a class with high scores for multiple outcomes and a class with high externalising and low emotional difficulties.

One pathway to mental health embodiment is social inequality (Krieger 2011) and it has been argued in chapter one that this is a fundamental cause of health inequality (Link and Phelan 2010). The analyses here add weight to this argument, with a consistent finding that young people from low SES backgrounds had higher odds of being in the less positive mental health trajectory classes. Low SES is associated with higher rates of mental health problems across the life course (Yu and Williams 1999), and lower flexible and psychosocial resources (Gallo et al. 2009; Link and Phelan 2010). Children from low SES backgrounds are likely to both perceive the ‘exposure’ of transition to be both more stressful (reflected in being more worried about the transition process) than more affluent children (Moore et al. 2021), as well as not possessing sufficient resources to respond to the stress effectively, resulting in poorer mental health outcomes for children with low family affluence and those transitioning from a low affluence primary school (Moore et al. 2020).

This study also supports the evidence that transition can be more challenging for children with SEN. A systematic review exploring the impact of primary to secondary transition on young people with SEN found that transition was characterised by lower levels of mental health functioning (Vaz et al. 2014b), and lower levels of perceived social support and higher levels of peer victimisation (Hughes et al. 2013) than for typically developing children. Children with SEN were also more likely to be worried about transitioning to secondary school, itself a frequent predictor of a poor transition (Rice et al. 2021). Jindal-Snape et al.'s (2020) systematic review highlighted young people with SEN as a group particularly at risk of transition having a negative impact on their mental health and who may have greater need for school support and intervention over the transition period (Bunn and Boesley 2019). They may also require different transition support than typically developing children (Neal et al. 2016).

When a child experiences a negative life event that they perceive to be stressful, they need to mobilise resources in response. Low resilience to stressful situations is predicted by high numbers of previous negative life events (Bonanno et al. 2007; Tiet et al. 2010) as high levels of stress can overload the developing brain and make it difficult for a child to find space to be resilient to a new stressful event. Thus previous stressors and their embodied effects become risk factors for future stress responses (McKeever and Huff 2003). A child who has experienced multiple potential stressors in the year prior to transition is likely to have reduced levels of psychosocial resources, and the threshold at which a stressor affects their mental health may reduce, making transition more likely to be perceived negatively (Slavik and Croake 2006). The empirical evidence presented in study one provides support for this argument, with young people who have experienced two or more NLEs prior to transition being at higher odds of being in a negative mental health trajectory class.

Gender inequality is also an important pathway to embodiment, and while there may be biological differences in how males and females experience the transition process, socialisation differences will also be at play. This study found that gender was a significant predictor of class membership, with females at higher risk of being members of the high emotional difficulties class and males being at higher risk of being members of both the high all and moderately high conduct

and hyperactivity grouping. Other research has shown that gender also influences the mental health trajectories that young people follow, with significant differences in the shape, level and timing of onset for males and females (Dekker et al. 2007; Gutman and Codiroli McMaster 2020). It is therefore likely that transition to secondary school has differential impacts on mental health for males and females. Chung et al. (1998), for example, found that girls tended to express higher levels of psychological distress both before and after transition.

Finally, the study one analysis found that worrying about transition was strongly associated with being in a class associated with high emotional problems, whether accompanied by behavioural problems or not. Research on a representative sample of young people in Welsh primary schools found that 14.4% of children were neither worried about nor looking forward to transition; 17.6% were worried about transition and not looking forward to it; 49.3% were looking forward to transition and not worried about it; and 18.7% were both worried and looking forward to transition (Moore et al. 2021). Children with lower SES, although frequently looking forward to transition, were more likely to have these positive feelings accompanied by worries than more affluent children, highlighting that social inequality impacts young people's perceptions of transition.

A number of studies have sought to better understand children's transition worries. Bullying, friendships, academic pressures, a new physical environment and relationships with teachers were the most important areas of worry found by Moore et al. (2021). The authors also found that while bullying and friendship worries were the most frequently cited worries for all children, children from primary schools with higher free school meal entitlement or low family SES and children with high internalising scores were even more likely to worry about bullying and friendships than more affluent students or students without high internalising scores. Rice et al. (2021) found that getting lost, losing old friends, homework, discipline and detentions, and being bullied were the biggest worries pre-transition. Schools at both primary and secondary level, as well as parents have an important role to play in alleviating these fears by creating supportive environments and addressing these concerns (Jindal-Snape 2016).

There may also be overlaps between these demographic characteristics - young people will hold multiple identities at once and their impacts on embodiment cannot be separated out. Negative life events, for example, may be more common in young people from low SES backgrounds (Hatch and Dohrenwend 2007) and there are also gender differences in how negative life events affect mental health, with significant associations between life events and emotional, conduct and peer problems (measured using the SDQ) in girls, and between life events and conduct problems and hyperactivity in boys (Flouri and Panourgia 2011).

10.2 Study two: Individual and school environment level predictors of mental health and wellbeing across the primary to secondary transition using multi-level modelling

The MLM analysis presented in chapter eight (study two) explored individual and school-level factors associated with young people's mental health using Welsh schools data from 2019. In line with ecosocial theory, mental health embodiment reflects an interaction between individual genetics and the environment, across the many ecological levels that impact an individual's their life (Krieger 2011; Krieger 2021). A range of mental health outcomes were investigated, including mental wellbeing (SWEMWBS), mental health problems (SDQ total difficulties), conduct problems (SDQ conduct problems subscale) and emotional problems (SDQ emotional problems subscale). As expected, there was considerably more variability at the individual than school level. The most persistent finding across all outcome measures was that mental health in year 6 (pre-transition) was predictive of mental health in year 7 (post-transition). It is clear therefore that mental health at the point of transition to secondary school cannot be isolated from a child's mental health trajectory prior to transition and that investing in young people's mental health needs to begin before they start secondary school.

For mental wellbeing, being worried about the transition was consistently associated with poorer outcomes, but findings were less decisive for low socioeconomic status. This is surprising given the argument that SES is a fundamental cause of health inequality (Link and Phelan 2010), however, one interpretation is that the association of SES with post-transition mental wellbeing

is mediated by pre-transition mental health, and therefore has already been adjusted for within the model. There is also evidence that SES is more strongly associated with low mental wellbeing and mental illness than it is with high mental wellbeing (Stewart-Brown et al. 2015; Nielsen et al. 2016; Santini et al. 2020). It has been suggested that high mental wellbeing might be more sensitive to relative rather than absolute deprivation (Nielsen et al. 2016). If SWEMWBS scores were dichotomised or put into quintiles ranging from low and high wellbeing, SES might prove to be a significant predictor of low wellbeing, but have less impact on high wellbeing in line with these other studies.

School-level meaningfulness (the extent to which a school's aims and aspirations for its students match the students' own aims and aspirations) was significantly associated with mental wellbeing. This finding supports the argument that schools act as an ecological level consisting of nested and non-nested social hierarchies, with the potential to act as a pathway through which inequalities can be perpetuated (Krieger 1999; Allen and Starr 2017). After controlling for individual-level covariates and school-level percentage FSM, a one-unit increase in school meaningfulness is associated with an average 0.65 unit increase in mental wellbeing (slightly more than one standard deviation within this sample). However, while high meaningfulness school-culture may be causing high mental wellbeing in students, which would offer a possible target for intervention to improve young people's mental health, there are other possible explanations, and the possibility of reverse causality between meaningfulness and mental wellbeing should also be considered. A school with particularly high numbers of students with high wellbeing would be likely to have higher attendance and attainment leading to a higher meaningfulness score. Higher wellbeing in these students might actually be due to neighbourhood or family characteristics (which have not been considered in this analysis) or other school characteristics. As argued by Aveyard et al. (2004) parental attitudes in particular might result in a child being sent to a school that reflects a family's values - i.e. some parents might deliberately choose schools that are highly meaningful. In this analysis, the value-added score is not available to parents, and had no correlation with school deprivation as assessed through percentage of children eligible for free school meals. However, both attainment and attendance data are available to parents,

and there were moderate correlations between both of these indicators and meaningfulness.

For the total difficulties score of the SDQ, the main predictor of higher difficulties (after pre-transition mental health) was SES, in line with fundamental cause theory (Phelan et al. 2010). This was a consistent predictor of mental health difficulties in year 7 across the models. However, it was not associated with either of the two SDQ subscales. This may be because it is the two subscales not looked at separately in this analysis (peer problems and hyperactivity) that are driving the impact of family affluence on total difficulties. Supporting the findings of the STARS analysis in study one (chapter six), when the emotional difficulties subscale of the SDQ was used as an outcome, being worried about secondary school was a significant predictor of higher difficulties and being female showed evidence of being associated with higher difficulties. Being male was associated with higher conduct problems.

The fact that there are differences in the predictors for mental health difficulties and mental wellbeing outcomes is not surprising if the two outcomes are viewed as being on two separate continua, rather than at opposite ends of the same scale (Iasiello et al. 2020). Previous studies have found that, for example, in migrants to Australia, younger age and being a student was predictive of mental distress but not mental wellbeing, while being self-employed and identifying with Australia was associated with mental wellbeing but not distress (du Plooy et al. 2019). Huppert & Whittington (2003) found that employment had a greater impact on mental wellbeing than mental illness, but poor physical health and a lack of social support had a bigger negative impact on mental illness and less effect on mental wellbeing. In a large sample of British adults, the relationship between many demographic characteristics (age, gender, ethnicity, employment, financial strain, poor housing and household composition) was differentially associated with symptoms of mental illness and lower mental wellbeing (Hu et al. 2007). Future research should consider whether mental illness or mental wellbeing are most effective targets for intervention. While there has been economic modelling of mental health prevention interventions as evidenced by a recent systematic review (Ha et al. 2022), mental illness and mental wellbeing have not been

considered separately in order to provide a comparison of future benefits in change of one compared to the other.

The association of school meaningfulness with mental wellbeing, but not with mental health difficulties is particularly interesting. Patalay and Fitzsimons (2016) similarly found that school connectedness, conceptualised as a measure of school environment, was more strongly related to child mental wellbeing outcomes than those for mental illness. The relationship found here between mental wellbeing and meaningfulness suggests that the latter may be particularly related to the assets that define good mental wellbeing, such as autonomy, positive relationships, purpose in life, environmental mastery, self-acceptance and personal growth (Ryff 2013) rather than the deficits associated with mental illness. By increasing school meaningfulness, the school environment is aligned with young people's own purpose in life and personal growth in particular, which should also help to tackle aspects of culture that perpetuate social inequality. As mental wellbeing is protective against mental illness, by building these assets in young people and therefore increasing mental wellbeing (Keyes et al. 2010), mental illness should also be reduced, although would be expected to lag behind improvements in mental wellbeing and could be assessed by looking at data from older cohorts.

Over a third of students (34.18%) experienced an increase in affluence between primary and secondary school, while a quarter (25.20%) experienced a decrease in affluence. While it is important not to over-interpret these findings as some of the change is likely to be due to imperfect test-retest reliability, it is worth considering that a decrease in affluence as assessed in this measure is likely to reflect wider changes to the child's life, for example, parental divorce or a parent losing a job. There was also some evidence that for children from poorer backgrounds, and those who experienced a decrease in affluence across the primary to secondary school transition, attending a less affluent secondary school was protective of mental health. School and individual-level affluence have independent and combined effects on child mental health (Moore and Littlecott 2015), and this finding highlights the interactive relationships between environment and individual in the embodiment of mental health. The protective effect of transitioning to a low affluence school, and the damaging impact of low

family affluence, appeared to be masked until both predictors were accounted for in the models. This may be because in more affluent schools, young people from poorer backgrounds may experience stress trying to conceal their poverty (Fernqvist 2013), withdraw from parts of school life (Busby 2019), or be more likely to experience bullying (Ridge 2009). Poorer students may also have better teacher relationships when they attend less affluent schools (Moore et al. 2017). High achieving schools, which are likely to have more affluent students, may also have negative impacts on mental health by putting pressure on students to perform (Luthar et al. 2020) which chimes with discussions about how in schools where there is a focus on academic achievement, there may be fewer valued school identities resulting in a less meaningful school experience for students who cannot assume one of the them (Markham 2015).

The only significant random coefficient was within the models predicting the SDQ conduct problems scale. It suggests that schools differ in their relationship between pre-transition behavioural problems and post-transition behavioural problems. A child with behavioural problems in year 6 can expect the level of their behavioural problems in year 7 to depend on the school they attend, with some schools seeming to mitigate against the impacts of behavioural issues in year 6 better than others. The regulatory order within a school determines and teaches acceptable student behaviour by providing a level of control. However in order for it to be effectively transmitted to students, they must perceive the level of control as being appropriate (Aveyard et al. 2004). This is more likely to happen where schools are weakly classified - because the level of control is less likely to be culturally incongruent - and/or to be highly meaningful - because the level of control is more likely to be perceived to be helping young people to meet their own aspirations. This analysis highlights the possibility that not all schools are able to build commitment to their regulatory order from their students, resulting in differences in behavioural outcomes. It also underscores the fact that a child's story as told in embodied truths is dependent upon their social and ecological context.

Finally, multi-level models of the emotional problems subscale were not a better fit than single-level linear models for most of the models in this analysis. Why emotional problems should have less school-level variability cannot be definitively

answered from this analysis, but it may either mean that emotional problems are less influenced by school environment than the other outcomes, or that the effects of schools on emotional health operate through processes which are relatively universal between schools. As increased emotional difficulties were associated with school closures during COVID-related school closures (Blanden et al. 2021), the latter explanation seems more likely.

10.3 Study three: Systematic review of universal interventions that target educational transitions

The systematic review reported in chapter nine (study three) sought to demonstrate the broad scope of mental health and wellbeing interventions across three different educational transitions. Social interventions speak of the possibilities of tackling injustice, and draw attention to the complexities of interacting levels, pathways and power within a particular socio-political context in the embodiment of health (Krieger 2021).

Across all types of transition, very few behavioral outcomes were improved by interventions compared to social outcomes, and emotional and psychological outcomes were relatively evenly split between positive and negative effects. Previous research suggests that indicated rather than universal interventions may be most effective at supporting young people with conduct problems (Scott 2008; Shelleby and Shaw 2014). Parenting and classroom environment were frequently targeted as a means of improving child outcomes during the earlier transitions, reflecting the important role of parents and teachers in early child development (for example, Daniels & Shumow, 2003; Hernández-Alava & Popli, 2017). Targeting both was generally associated with positive outcomes, consistent with a conclusion that interventions with multiple components are more likely to have positive point estimates. It also supports the argument that environmental factors can reduce the stress associated with the ‘exposure’ of school transition and thus shift population distributions of mental health embodiment. However, the transition to post-compulsory education was associated with more focus on peer relationships, reflecting theoretical perspectives on emerging adulthood and the diminishing role of parents (Arnett 2000). The aspects of mental health prioritised as intervention outcomes also appeared to shift between different transitions, with

greater focus on behavioral outcomes for younger children and more focus on psychological outcomes for the transition into post-compulsory education.

While much focus in this thesis has been on school as an ecological level that can influence mental health (Bronfenbrenner 1979; Krieger 2011), there are also other levels that should be considered. This review clearly highlighted the role of the home environment as an ecological level that has a big impact on young people's mental health status. Many interventions focused on parenting skills, like discipline, praise and communication to support parents to build home environments where children's mental health is nurtured. A positive parent-child relationship is important across the life course, and can moderate the relationship between negative life events and depression by providing social and emotional support (Ge et al. 2009). Notably, parent-child relationships have been shown to be important moderators of the secondary school transition experience (Waters et al, 2014).

Perhaps surprisingly, this review found no evidence that timing of interventions around transition (e.g. pre-transition vs. post-transition vs. pre and post transition) was associated with more, or less, positive outcomes. It might be expected that interventions that follow children between settings and include components either side of transition would have more positive, sustained outcomes by being able to provide more prolonged targeted support to young people, but this hypothesis was not supported by the evidence available. Interventions that were rated as 'some concerns' rather than 'high' risk of bias tended to have more positive outcomes (REDI-C, REDI-P, Chicago School Readiness Project), although it is not clear whether this is due to risk of bias or other intervention characteristics.

Many public health interventions fail to sustain their effects despite initially positive findings (Bailey et al. 2017), however there is also evidence of the converse - whole-school interventions have been shown to build in effectiveness over time, as students are exposed to the changing environment (Patton et al. 2006). This review found that outcomes assessed two years after the intervention had finished ('sustained follow up') were broadly favorable but fewer in number than those measured within six months of the end of the intervention. While this provides some evidence that fade out was minimized in these interventions, there

is also evidence of possible selective reporting as positive outcomes early post-intervention were more frequently followed up in subsequent studies than those that showed no effect.

School readiness at age four, successful transition during adolescence and transition into post-compulsory education are all likely to be more problematic for children from low socio-economic backgrounds (Devlin and McKay 2014; Camacho et al. 2019; Jindal-Snape et al. 2020). In line with this established literature on SES differences in school readiness, most pre-school transitions targeted low-income families. However, this focus was less apparent for the other two transition types, which suggests that there may be less awareness of the difficulties that young people from low SES backgrounds often experience when they transition to a new school and how transition may perpetuate societal inequality.

Interventions have the potential to both reduce or increase inequality between groups, feeding into embodied injustice, even where health across the population is improved overall (Lorenc et al. 2013). Therefore assessing any differential effects should be an important part of intervention evaluation. However, few studies assessed socioeconomic gradients in effects within this review, a concern previously reported for school-based health interventions (Moore et al., 2015). This is particularly relevant when SES is viewed as a key pathway to mental health embodiment and a cause of fundamental cause of inequalities in population distributions of mental health (Link and Phelan 2010; Krieger 2011). Fade out of intervention effects over time may also be more of a concern amongst children from low SES backgrounds, and indicative of the cumulative effect of higher numbers of stressors and lower resources to adapt to them (Pressler et al. 2016). It is therefore important that intervention effects be considered based on child socioeconomic status, both over the short and long term.

Notably, few papers stated an explicit theory of change. There is a distinction between theory used to explain why an intervention might cause change to occur and a theory of change (De Silva et al. 2014), and while papers within this review broadly used theory to ground their research, most failed to then use this

theoretical underpinning to develop a theory of change, or to report it in line with guidance (Breuer et al. 2016). In critical realism, a theory of change is an essential part of understanding the mechanisms underlying an intervention (Bonell et al. 2018) which is a first step to transferring an intervention to a new context. Without attempting to understand what is happening at the 'real' level of reality, rather than just focusing on empirical findings, there will be gaps in understanding context-dependent intervention impacts which may affect translation to a new, potentially very different, school environment (Rychetnik et al. 2012). Ecosocial theory offers a basis on which theories of change could be developed, with its focus on pathways to embodiment across levels and over time within a particular social and historical context (Krieger 2011; Krieger 2021).

This analysis focused on universal interventions, with the exception being interventions focused on children and young people from low SES backgrounds. Many of the targeted interventions excluded from this review were based on medical diagnoses. Examples of papers that were excluded at the title and abstract screening stage include those focusing on young people with autism (e.g. Mandy et al., 2016; Ong et al., 2012), attention deficit hyperactivity disorder (e.g. Sibley et al., 2018), special educational needs (e.g. Bunn et al., 2017; Bunn & Boesley, 2019) and developmental disabilities (e.g. McDermott et al., 2018). Despite this thesis considering how SEN impacts upon transition in studies one and two, to include interventions targeting children with a very broad range of SEN alongside universal interventions and those targeted at children from low SES backgrounds would have made the review too heterogeneous to be meaningfully synthesised. Future research should consider interventions focusing on the transition period for children with SEN, particularly as these children may find universal approaches stressful (Neal et al. 2016). For similar reasons, a small number of interventions that targeted young people based on screening for behavioral and psychological problems were also excluded. For example, Hart et al. (2016) found that for children with behavioral problems in pre-school, high intensity summer camps prior to transition to kindergarten were more effective than low intensity camps at reducing behavioral problems. Bayer et al. (2018) found some evidence that a targeted parenting intervention improved internalizing problems in children transitioning to kindergarten, although anxiety was not reduced. Future research should consider whether there are particular groups of

young people for whom a targeted approach to transition interventions would be more favorable than universal intervention.

10.4 Comparison of empirical findings

Both sets of quantitative analyses presented in chapters six and eight included a range of individual-level variables to assess their association with particular mental health outcomes. Despite the data coming from two different UK countries and therefore different schools, and being set apart by seven years, analyses involving the three shared variables - child SES, gender and whether students were worried about the transition to secondary school - produced broadly complementary findings. SES was an important predictor in both analyses (albeit less strongly associated with mental wellbeing than mental health difficulties in the multi-level modelling), and findings for gender supports previous evidence that emotional problems are more common in females than males, and conduct problems more common in males (Leadbeater et al. 1999; Green et al. 2005). Being worried about transition also appears to be most closely associated with emotional rather than conduct problems - in the LCGA (chapter six) membership of the class associated with high emotional and low conduct problems was predicted by being worried about secondary transition, while the class associated with higher conduct problems and lower emotional problems was not. This is reflected in the MLM analysis (chapter eight), where being worried about transition was a significant predictor of the emotional problems subscale but not the conduct problems scale.

Both critical realism and ecosocial theory place emphasis on context - the former as a means of understanding context-dependent mechanisms of action, and the latter to account for how political and historical factors interact across levels to influence mental health embodiment. Education is devolved in Wales and therefore the Welsh Government, which was led by Welsh Labour in 2019 when these data were collected provides a slightly different context to the educational system in Wales compared to that of England (where Westminster was Conservative-led in 2012 when the STARS data were collected). Wales has largely resisted the market reforms to education that have taken place under New

Labour and then the Conservatives in England, produced a slightly diverged educational context. There are also differences in pupil composition between the two datasets - STARS schools in South East England had higher proportions of ethnic minority students and students without English as a first language; in the Welsh data, there are Welsh language schools included in the analysis, and a higher proportion of schools in rural or suburban areas. However despite these differences in educational contexts, it appears that similar mechanisms are at work. Socioeconomic status, measured either as being eligible for free school meals (STARS data) or through the family affluence scale (CHETS-SHRN data), remained a key predictor of poorer mental health across a range of outcomes and therefore supports the assertion that it is a fundamental cause of poor health, with its impacts remaining consistent across very different contexts (Link and Phelan 2010).

It has been argued previously that the underlying mechanism is access to resources, both flexible and psychosocial (Phelan et al. 2010; Taylor and Broffman 2011). This mechanism would only be switched off if resources could be decoupled from the transition experience - i.e. if transition could be experienced without requiring resources. While this may not be entirely possible, there are situations in which need for resources might be minimised. The first is through making transition less stressful, which it is been argued could occur if secondary schools in particular adapted their environment so that it was more meaningful and weakly classified, as well as managing the transition process to reduce stress. This thesis has provided some support for high meaningfulness schools being better able to support young people's mental wellbeing as they start secondary school.

The second situation where resources might be minimised is either by removing transition completely, or changing its timing. A qualitative study exploring the US school system, where school transitions occur at different ages in different parts of the country, suggests that earlier transitions are perceived to be more difficult for children (Bagnall et al. 2021). In Wales there are increasing numbers of schools that cover all ages - for example in the development of the meaningfulness measure, of the 199 secondary schools in Wales included, 18 were schools serving children from ages 3-16 or 3-19. The extent to which these

schools separate young people into primary and secondary units, and therefore how students perceive transition, is not clear. An analysis comparing mental health of Australian students across the primary to secondary school transition, to those from Denmark, who tend to stay in the same school rather than transition did not find evidence that Australian students were more likely to experience poor mental health over this period (Nielsen et al. 2017). This, may, as the authors highlight however, be due to differences in the support available to students to increase school connectedness across the two countries. A comparative analysis within the same country would help provide greater insight into the effects of removing transition by reducing cultural and political differences between school systems.

It is also possible that children who do not experience a transition between primary to secondary school may find later life transitions more difficult, having not already built the requisite resilience and coping skills. Recent research suggests that the issues causing students distress on transition to university are issues they have historically always had to deal with, including building a new social network, yet in the past did not seem to have negative impacts on mental health to the same degree (Thompson et al. 2021). This may be because young people have been more cossetted than in previous generations and arguably, young people who do not experience stressors are less prepared for future independent living. Therefore future research should consider whether the primary to secondary transition is in fact beneficial for later development, and also whether children who have a more difficult transition, for example by not transitioning alongside primary school peers, benefit in the longer term. This is connected to the focus of the MLM analysis on standard transitions, where peers tended to transition together to a common secondary school. Non-standard transitions may be even more challenging for young people, particularly those with SEN or from low SES backgrounds as responding to the ‘exposure’ is likely to require greater levels of personal resources. While the numbers were too small to look at this in any depth in this analysis, future research should compare experiences of non-standard and standard transitions.

10.5 Strengths

The empirical research presented in this thesis has a number of important strengths. Firstly, the analyses in chapters six and eight are based on subsamples of large, nationally representative, longitudinal datasets. Latent class growth analysis (chapter six) is a complex, powerful and accurate statistical method that enables the modelling of change over time of different outcomes (Green 2014). The analysis presented here provides clear and compelling evidence that young people transitioning from primary to secondary school form subpopulations based on their mental health trajectories, and that these trajectories are predicted by their individual characteristics. It provides a basis from which future research could consider how trajectories change over a longer time period, and also whether there is change between the six-monthly data collection points used in this analysis.

The multi-level modelling analysis (chapter eight) has broadly complementary findings with the LCGA, despite the data coming from different parts of the UK and data being collected several years apart. Overall, the analyses found that, in line with the literature, SES, SEN and being worried about transition are associated with mental health across the primary to secondary transition. They also build on this by considering other individual-level predictors, including negative life events and gender. The MLM enabled higher level predictors to be considered, and therefore is an important method for including school environment as an important determinant of young people's mental health and population distributions of mental health inequality. At the school-level, three key concepts are explored in the context of transition and mental health - school affluence, classification and meaningfulness. The meaningfulness measure was developed based on national data from all available secondary schools in Wales and is therefore developed at a population, rather than sample level. It is the first analyses to consider how self-reported mental health is related to classification and meaningfulness. Mental health is considered in its broadest form by looking at individual SDQ subscales as well as mental wellbeing, and demonstrates how mental health experiences vary across the school transition period - not just by individual characteristics, but by the mental health outcome being considered.

The systematic review fills an important gap in the school health literature by providing systematic, detailed evidence on a broad range of interventions crossing three different educational transitions that have sought to improve mental health outcomes in young people. It highlights the similarities and differences in interventions for transitions at different ages, and the important role of parents, teachers and peers in supporting successful transitions. Methodologically, it is able to present findings on highly heterogeneous interventions and draw conclusions based on their effect directions, rather than solely rely on a narrative discussion. It also highlights gaps in research around possible intervention gradients for young people from low SES backgrounds and the importance of considering how changes to school environment might be able to reduce the mental health impacts of transition.

10.6 Limitations

10.6.1 Consideration of measurement as a source of error

In operationalising and measuring a range of variables in this thesis comes an acknowledgement that these assessments are operating at the empirical rather than the real level of reality. With this comes measurement error.

Mental health and mental wellbeing have been measured and assessed in many different ways in this thesis. In the LCGA, the four subscales of the Strengths and Difficulties Questionnaire (SDQ); in the multi-level modelling, Me and My School, SDQ and the short version of the Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS); in the systematic review, a wide range of methods were used including child self-report, parental report and teacher report measures, behavioural observations and interactive assessments. The mental health measures varied widely in their scope, resulting in the four outcome categories identified - emotional/psychological; behavioural; social; and mixed. Any measurement of mental health, whether aligned to mental illness or difficulties or mental wellbeing will only be as good as the method used to assess it, and no scale should be assumed to be fully capturing the construct that underlies it. Child reports of different mental health symptoms are also not necessarily equally valid. In particular, there is decades long evidence that child report of hyperactivity

symptoms in children with high levels of hyperactivity tends to be underreported (Loeber et al. 1991; Smith et al. 2000; Raiker et al. 2017). Comparing parent and teacher reports of different mental health outcomes with child-report data would help to better understand the findings of this research. The STARS study (child-report data used in study 1) did also collect parent and teacher reports, and further research could look at how these reports differ or support the child-report findings. No parent or teacher report data was available for the CHETS-SHRN data analysis.

SES can be viewed as an absence or presence of material, human and social capital (Oakes & Rossi, 2003). Assessing child SES can take a number of forms. The STARS analysis used the binary measure of whether a child was eligible for free school meals which is based on family or child receipt of certain means tested benefits (UK Government 2022b) and are therefore focused on material capital. It is not a perfect measure of low SES, notably because it is likely to exclude children who are technically eligible but whose parents have not applied for it, but remains a useful indicator of children living in low SES households (Taylor 2018). The multi-level modelling analysis used the continuous measure of the child-report family affluence scale. It is a more subtle measure of SES than FSM eligibility, but all questions remain focused on material capital. Young people are frequently unable to report on parental education, occupation or family income (Wardle et al. 2002), and therefore to capture other aspects of SES, parent-report data would have to be obtained. Measures of SES in the systematic review also commonly focused on material capital (family income, eligibility to free school meals, eligibility to food stamps), with a minority of papers considering parental education and occupation.

The measure of SES used has implications for analyses and different measures of SES differentially predict different adult health outcomes (Geyer et al. 2006), and act via different mechanisms. While occupation is associated with psychosocial stressors affecting level of control at work as well as social prestige, income directly affects material resources - housing, clothing and food - as well as providing resources to respond to stressful situations. Parental education affects childhood social environment, as well as adult health literacy and compliance to treatment (Geyer et al. 2006). Similarly, Torssander & Erikson

(2010) argue that measures of income, occupation class, occupational status and education are “related to separate mechanisms by which socioeconomic differences influence mortality” (p.472). SES also does not just exert it effects through objective measures of SES, but can also be assessed as a subjective measure - i.e. how people rate their own position in society (Hoebel et al. 2017). Subjective SES is an important predictor of mental health (Scott et al. 2014). Further consideration of how cultural and social aspects of SES could be operationalized, as well as subjective elements would help to further explore the relationship between SES and child mental health.

It has already been discussed within the systematic review chapter (chapter nine) that it was not possible to know how the terms ‘gender’ or ‘sex’ were being used by the original study authors, and therefore that the terms used in the systematic review reflected the terminology used in the original papers. For the LCGA analysis, gender data were based on school administrative records, and therefore it is not clear how this was being conceptualised and whether it was actually a measure of child sex. In the multi-level modelling, CHETS data were initially used to assess gender. The survey asked ‘Are you a…’ with the options of ‘Boy’, ‘Girl’, ‘Prefer to self-describe (please write this down)’, or ‘Prefer not to say’. All students answered either boy or girl, except for two, who had missing values. It was possible to fill in these values using the linked SHRN data, where both students had responded, and gender is thus treated as binary in this analysis. For an older cohort, there may be greater need to consider non-binary responses as they tend to increase from year 7 to year 11 (Page et al. 2021b). In the analysis of the full 2019 SHRN dataset across years 7-11, approximately 1% of students (n=1472) stated that neither male nor female terminology described them, and a sub-analysis of this group of students suggested that they had particularly poor mental health compared to children stating they were male or female (Page et al. 2021b). It is therefore important to consider how the terms gender and sex are being used within each analysis, and also how young people who do not identify as male or female might have different experiences of the transition process - perhaps more so for later transitions such as from school to further or higher education.

The term ‘special educational needs’ (SEN) is a broad umbrella term that has been necessarily converted into a binary variable in this thesis (in the LCGA and in production of the meaningfulness measure), but which, by collapsing it in this way, cannot hope to fully capture the full nuance of young people’s experiences. Differences in experiences between individuals at highest and lowest levels of need cannot be separated, and neither can the differences between individuals with very different types of SEN. Children with SEN will include those with learning and intellectual disabilities, specific learning difficulties such as dyslexia or dyspraxia, neurodevelopmental disorders, including autism and attention deficient (hyperactivity) disorder (ADHD/ADD); and physical disabilities (Hughes et al. 2013). These different educational needs are likely to have different impacts on transition experiences, and the mechanisms at play will differ (McCoy et al. 2020). For example, children with ASD frequently have a strong need for routine and consistency, and school transition is likely to cause stress due to the many changes it brings to the child’s life. Children with ADHD are likely to struggle with the pressure transition puts on their executive functioning skills, affecting self-regulation and thus having impacts on planning and organisation. For children with intellectual disabilities, the changes in academic work and support available in secondary school compared to primary school may affect their experiences of school transition, and for all children whose learning needs impact upon their ability to make new friends, transition poses a particular challenge.

Furthermore, measurement error may be due to how SEN is assessed and assigned. There is evidence that SEN status is more likely to assigned to children with low SES and is also closely linked to ethnicity - children from Gypsy or traveller backgrounds have very high rates of special educational needs in national statistics and Black children have particularly high rates of EHC plans (Van Herwegen 2022). There is also evidence that summer born children are more likely to be assessed as requiring additional help, suggesting that there may be a failure of schools to take immaturity into account (Van Herwegen 2022). This potential subjectivity in SEN diagnosis also leaves it open to abuse and there has been some concern that there are perverse incentives for some schools to artificially inflate the numbers of children with SEN in their schools (Maddern 2010).

Finally, the STARS analysis (chapter six) considered negative life events (NLEs). As has been previously discussed, NLEs overlap with adverse childhood experiences (ACEs), with the actual events or experiences included in each largely depending on which scale is being used. ACEs scales do tend to focus on experiences perceived to be most damaging - for example, parental death, divorce or child abuse (Hughes et al. 2017), while the NLEs scale used in this analysis included some of the same experiences as in the ACEs literature alongside potentially less extreme examples, such as doing badly in an exam. One of the main critiques of the ACEs literature is the retrospective nature of respondent reports, which may be vulnerable to recall bias (Kelly-Irving and Delpierre 2019). In this study, young people were asked to report on their experiences of 19 possible NLEs in the previous 12 months, which is arguably less problematic for recall than ACEs literature that asks adults to report on experiences across their whole childhood many years after the events. However, it still relies on accurate recall and there also remains an issue with including a wide range of different life events within the same measure being equally weighted, as it is likely that they do not all have the same negative impact - i.e. the death of a parent being equally weighted with the effect of doing badly in an exam. However, the findings suggest that the measure was able to detect an association between a broad range negative life events and childhood mental health trajectory.

10.6.2 Study one: Latent class growth analysis

The latent class growth analysis (LCGA) presented in chapter six has a number of limitations. The most important is that data were only collected at three points. This meant both that only linear slopes could be estimated when alternative shapes may have been a more accurate reflection of the growth curve relationship, and also that the full period of change was unlikely to have been represented. The impact of transition on mental health may begin earlier than the first time point, and continue beyond the end of year 7. There may also be change between the data collection points that have been missed due to the spacing of the data collection. It is also not possible to ascertain whether these four classes hold at other ages, they may differ in earlier childhood/later

adolescence. Importantly, by only assessing linear growth relationships, it was not possible to ascertain whether there was a change in trajectory at the point of transition - i.e. whether the trajectory that individuals were on in primary school shifted at the point of transition, highlighting its influence on their trajectory. Future research should aim to have at a minimum four, but ideally more, data collections, and to continue them beyond the first year of secondary. This would also bring more confidence to selection of models based on fit statistics, by better representing the data available. In this case, the four-class model was selected based on theoretical and empirical considerations, however, the decision was not totally unambiguous, and better fitting models would help decision-making in future studies.

Ideally this research would have extended the analysis to more complex growth mixture modelling (GMM) rather than stopping at latent class growth analysis (LCGA). LCGA is a special case of GMM where within class variability is assumed to be zero. In reality, this assumption is unlikely to be fulfilled in many situations and being able to further model this variability would potentially provide more accurate depictions of subpopulations. Bias and higher measurement error may been introduced by using first order LCGA rather than second level (Geiser et al. 2013). However, in both of these cases, the high computational load of the models made it impractical for either GMMs or second order LCGAs to be modelled. It would also have been interesting to be able to look more closely at how individual-level factors might interact to affect class membership. Due to the complexity of the modelling, it was not possible to test for interactions using the methodology presented in chapter six, although a simplified version which excluded the multiple imputation stage of the three step procedure is presented in Appendix 1. No significant interaction effects were found. However, despite this finding, it is important to consider intersectionality (Collins and Bilge 2020) in how young people experience school transition, and future research should seek to better test interaction effects in a larger sample.

Finally, there were missing data at the first data collection time point that required the use of FIML and multiple imputation for different stages of the analysis. Missing data also meant it was not possible to account for primary school clustering, which may have artificially reduced confidence intervals on any

statistical tests, although secondary school clustering was accounted for using dummy covariates. School-level clustering was relatively low across all outcomes and all time points (ranging from 0.00 to 0.02). Due to the low number of secondary schools, estimates of school-level variability are unlikely to be accurate, and ultimately, the majority of variability will be at the individual level.

10.6.3 Study two: Multi-level modelling analysis

The analysis of the CHETS-SHRN data first sought to develop two measures of school-level culture. The first was a measure of classification, which given that the survey questions used were not developed for this purpose, was problematic. Two separate measures were therefore developed, with one assessing teacher perceptions of student engagement and the other, pupil perceptions of student engagement and teacher support. No questions on discipline or parent engagement remained in the final analysis. While it is positive that two measures did emerge with acceptable reliability in terms of internal reliability, the teacher perceptions measure in particular may lack inter-rater reliability (Frey 2008). Only one senior staff member in each school responded to the survey, thus it is not possible to test whether other staff members would provide responses that correlate strongly with the responses received here. Ideally, multiple staff members would have responded to these questions as in other studies, for example, Galanti et al. (2016).

Having selected the initial variables based on theoretical considerations, the EFA then relied heavily on Cronbach's alpha as a means of selecting variables to be included in the measure. Cronbach's alpha is a measure of the proportion of 'true' score in the measurement - i.e. a value of 0.8 suggests that 80% of 'true score' of the latent construct is being predicted by the measure, but that 20% of the measure is error variance (Osborne 2014). However, a scale may have apparently low internal consistency (and therefore not be considered further) but have high predictive value. The conduct scale of the strengths and difficulties questionnaire (SDQ) used throughout this thesis, for example, is well known for having a lower alpha than often seen to be acceptable, however, it remains a highly predictive scale of child conduct problems (Goodman 2001). Conversely,

high internal consistency doesn't mean that something of importance is being measured, and therefore assessing validity is important (Raykov 2012). Face validity was used to select the items to be included in the EFA, however there were not questions available about all potential domains of classification (Shackleton et al. 2017), potentially violating content validity. Due to the highly exploratory nature of this analysis, where items had not been developed with this measure in mind, alpha was the only realistic means of selecting variables, however ideally, the process would be more theory-led.

Pupil and teacher perspectives measures were only very weakly correlated, suggesting their views on school boundaries differ. This may be a genuine difference, with each perspective offering complementary and useful information that can be combined to provide a more complete picture (McGrath et al. 2020). It may also be that schools involve some pupils in decision making but that involvement may not be sufficiently democratic or visible for it to be recognised by the wider student body as part of how the school operates. School staff may also respond in a more positive light than justified in order to give a certain impression of their school and therefore their responses may not be reflected in actual practice (Gaia 2020). The two classification measures appeared to have little impact on any of the outcomes, although their addition into the models did help to reduce school-level variance. This may reflect the fact that data was collected early in year 7 and that school environment effects can take time to exert an impact. However, it may also be that the measures themselves are not sufficiently valid. If this is the case, in order to more effectively test, and potentially challenge, the proposed relationship between school boundaries as originally conceived by Bernstein (1975) and developed by Markham & Aveyard (2003), a more robust measure needs to be designed which could be followed up by a confirmatory factor analysis.

The second school-level measure sought to assess school-level meaningfulness. Unlike some of the other studies where a similar measure was developed (Tobler et al. 2011; Bonell et al. 2017), it was not possible to include a measure of proportion of students speaking English as an additional language within the regression model. In the Welsh data, this variable was problematic due to the number of schools that did not report this data (38% of Welsh secondary schools

were missing these data in 2019; n=75). This missingness was largely associated with a school being bilingual or Welsh medium. The Index of Multiple Deprivation (IMD) variable was based on the deprivation score associated with the school postcode rather than a child's home postcode, which may not fully represent the socio-demographic intake of the school. While many children will live close to their secondary school and therefore the IMD score will have direct relevance to them, in some cases this will vary widely. This is particularly the case in Welsh medium schools in local authorities that may only have one option for local students (who may then choose to travel some distance to attend) and also for faith schools. However, as this was used alongside percentage free school meal eligibility, it remained a useful additional indicator of student deprivation. Due to changes in how school-level attainment was reported in 2019 it wasn't possible to include a five year average for each school as the outcome variable. This may have a minor impact on the reliability of the measure.

The main limitation of the CHETS-SHRN dataset was sample size. While the CHETS survey included 2170 students originally, only 612 could be linked to the SHRN post-transition survey, and then this number decreased further as the analysis progressed (see flowchart in chapter eight). This may have resulted in some loss of representativeness in the sampling, and also means that some findings that might have been significant in the larger original sample failed to be so within this analysis. However, importantly, despite these caveats, the findings chime with those from other empirical studies, with the same key predictors of mental health across the primary to secondary transition being highlighted as important. Future research should seek replication in a larger representative sample. A larger sample, and more primary school level data would also allow consideration of how primary school environment might be associated with mental health outcomes across the transition period.

10.6.4 Study three: Systematic review

It is likely that not all possible papers have been included in this review, not least because some eligible papers are likely not to describe themselves as transition interventions and might therefore have been overlooked by search terms. Of those interventions included, most were based in the USA - just two were in

Europe and none were in low-income countries - suggesting limitations to the generalisability of findings and the need for more research into how interventions might support educational transitions in other parts of the world.

It was not possible to produce a meta-analysis of findings due to heterogeneity of effect measures used in the interventions (for example, standardized mean difference, Pearson's r, Cohen's d, regression coefficients) and insufficient information to convert them to a common measure. The heterogeneity of study designs would also have made a meta-analysis inappropriate. Thus, in order to use quantitative evidence of effectiveness and compare studies with different effect measures, effect direction plots were used in the current study. The use of effect direction plots underlines the move away from the reliance on p-values in estimating effects (Wasserstein et al. 2019) and can help to ensure that underpowered studies are not excluded from evidence. However, it may mean that very small changes from the mean may be misidentified as effects rather than noise, and this is particularly an issue when reviews only have a small number of studies because any misidentified effects may not balance out.

Not all of the transitions included, particularly in preschool to school category, necessarily involved a change of school and this wasn't always clear from the papers. Studies were included irrespective of whether the transition involved a physical move. This broad theme of the difficulties of comparing very different interventions is apparent across the review. Very similar interventions - for example, the standard and reconstructed interventions in Quinn et al. (2019) and CSP/CSP-Plus in Mason et al. (2016a) - were also included separately in the effect direct plots as they were technically different interventions, but their similarities to each other are far greater than to other non-related interventions and arguably this could skew any findings.

Assessing risk of bias was problematic. In interventions where blinding of participants is not possible and where outcomes pertain to the lived experience of mental health, the high risk of bias associated with self-reporting is not fixable. Even where interventions used other outcome assessors and the papers stated that assessors were naïve to treatment group, the RoB2 guidelines argue that evidence is needed to support these statements if they are to be taken seriously

(Higgins et al. 2019). This resulted in many studies receiving high risk of bias categorization and none receiving low risk.

Finally, and of relevance to all the empirical chapters of this thesis, it is important to note the difficulties associated with isolating mechanisms within social research. Although all but two of the interventions included in the systematic review were either randomised controlled trials (RCTs) or cluster RCTs - a research design that carries with it an expectation of experimental control - social RCTs act in open systems, and therefore are different to those in experimental science. It is likely that multiple mechanisms are at play in these studies, and uncovering them is problematic even within the context of an RCT.

10.7 Future research into school transition

The findings presented in this thesis suggest a number of possible avenues for future research and potential policy development. Firstly, this thesis has focused on quantitative analysis operating at the empirical level of reality, which only provides a narrow perspective on school transition. Qualitative research could therefore add the findings presented in this thesis. This might include a retroductive process involving the voices of students, parents and school staff involved in the transition process, and to better understand how psychosocial and flexible resources act as potential mechanisms that mediate the relationship between school transition and young people's mental health. This would enable building greater understanding of how psychosocial and flexible resources limit young people's capacity to maintain their mental health across educational transitions, and whether some resources appear to be more important than others. It could also explore the mechanisms operating within each resource type to understand how and why each resource has its effect, as well as questioning whether other mechanisms are in operation, including how student agency acts to determine transition experiences. Future research could also aim to identify transferable transition intervention mechanisms so that effective interventions can be developed, and specifically those that do not exacerbate socioeconomic, gender or SEN-based inequalities for young people. Retroductive approaches would help to better understand mechanisms that are specific to the groups of

students identified in this research as been more prone to poor mental health outcomes following transition.

This thesis has considered transition from English (chapter six), Welsh (chapter eight) and global (chapter ten) perspectives, however none have been able to account for the impact of the COVID-19 pandemic as data was collected prior to its occurrence. For schools in all parts of UK and further afield, COVID-19 has impacted transition to secondary school, as well as transition to other school and work settings, for thousands of young people. This research highlights the importance of school transition as an exposure that is both socially, temporally and historically situated (Krieger 2011). For those young people who missed out on support across the transition period due to COVID-19, there is likely to be an even greater imperative for schools to provide a supportive environment, not least because of the negative impacts of the pandemic on mental health (Creswell et al. 2021; Moore et al. 2022; Winter and Lavis 2022). Future research should consider the long-term impacts on this cohort's secondary school experiences.

The English education system contains a range of different types of secondary schools, including grant maintained, foundation, faith, free, academy and grammar schools, as well as fee-paying secondary schools. The STARS analysis in chapter six was not able to look at how transition and mental health outcomes varied between these school types, and future research may wish to consider whether there are differences in young people's experiences. For example, children who have passed the 11 plus exam and transition to their local grammar school may have different experiences to children who transition to an academy, or those children who 'fail' the 11 plus and are therefore forced to go to a school that is not of their choosing. School environment is also likely to differ between school types due to different expectations, priorities, power structures and pupil characteristics, and this would be expected to impact upon population distributions of mental health.

In Wales, there are fewer secondary school types, and no grammar schools requiring selective entry. However, in September 2022, a new curriculum was launched in Wales and one of its main themes is that schools should take a whole-school approach to mental health which includes promoting a positive

school culture (Welsh Government 2021). It will be important for there to be longitudinal evaluation of the impacts of these changes on transition from primary to secondary school, and its impacts on young people, compared to earlier cohorts prior to the change. This has coincided with the Welsh Government adding mental wellbeing to its priorities for school transition planning (Senedd Cymru 2022) although the specifics of how mental wellbeing can be ingrained within transition planning have not be dictated to schools and will require more evidence. A key element is likely to be the importance of allowing student voice and agency to be exercised so that their views about the challenges of transition are privileged over those of teachers, parents and other adults. More research is also needed to better understand exactly which transition activities are most effective, what their timing should be, and whether they are equally effective for all groups of young people. Local authority involvement in transition planning, which was initially evaluated in 2010 (Estyn 2010), should also be reviewed, particularly from the perspective of schools and families.

Although the focus of this thesis has been on transition, an important finding is that mental health prior to transition is the biggest predictor of it post-transition, and therefore that mental health of young people should be prioritised from an early age, including throughout their time at primary schools. To fully understand the impacts of transition on mental health, data collection needs to begin much earlier than year 6 to see whether transition represents a continuation of increasing mental health problems that have already begun in primary school, or whether transition has an additional effect. This would help to fully understand the impact of transition as an ‘exposure’ as has been theorised in this thesis, and its potential to influence future mental health embodiment. Mental health of primary-aged children is, like that of those in secondary school, not developed in a vacuum, and therefore requires full theorisation based on how social, historical and political context interacts over time and across levels is required.

More research is needed into the practical steps that schools can make to increase their meaningfulness as conceptualised here. Previous papers have argued for more research on the lived experiences of young people and observational studies to understand the processes and structures that might be influencing young people’s commitment to their school (Aveyard et al. 2004;

Markham et al. 2008; Tobler et al. 2011). Building effective support and control within schools so that students feel able to meet their aspirations through commitment to the instructional and regulatory orders of their school is likely to be a central concern - although this comes with the caveat that universal approaches may be unable to meet the needs of all students (Markham et al. 2021). For some students, extracurricular activities, a curriculum focusing on employment rather than academic skills and/or higher engagement with parents and communities might help increase the range of valued school identities and therefore promote commitment to the school orders (Markham et al. 2021). Intervention research that seeks to modify different aspects of the school environment has also been advocated (Bonell et al., 2017).

The family is an important ecological level that plays a significant role in building young people's mental health and supporting them across educational transitions. Parents' own psychosocial and flexible resources are, however, particularly from a socioeconomic perspective, likely to reflect those of their children, and therefore parents with fewer resources may require greater school engagement, while also potentially facing greater barriers to engagement than those from more affluent backgrounds. This may represent an additional mechanism by which poorer young people experience embodied injustice in their mental health outcomes. Parents of young people with SEN should also be aware that transition may prove more problematic for their child and there needs to be greater communication with and between both primary and secondary school to ensure young people are being supported fully. Some young people will require differentiated transition support, and more research needs to look at what is helpful in practice. With this should come greater awareness of the importance of building high mental wellbeing in young people as a means of reducing mental health problems, and the importance of encouraging young people to engage in recreational and relational activities (Santini et al. 2020).

While prevention has to be prioritised in public health intervention, many young people will experience poor mental health as they experience an educational transition and it is vital that the services they need are in place. Schools and universities need to have systems in place for identifying and supporting young people with mental health problems, which will require ensuring adequate

workforce provision of trained staff members and counsellors. Screening young people within school to assess their mental health may be a helpful approach (Barker et al. 2022; Woodrow et al. 2022). However this would need to be accompanied by sufficient effective intervention in order for it to actually benefit mental health outcomes and be ethically acceptable. Outside of school, while it is beyond the scope of this thesis to provide a comprehensive critique of the current state of mental health support for young people in the UK, others have clearly highlighted the difficulties in access and gaps in provision of child and adolescent mental health services (CAMHS) in the UK (BBC News 2018; NHS Confederation 2021) and this is replicated globally (Wise 2021).

Many young people, particularly those most vulnerable and from the most disadvantaged backgrounds, will experience a transition to work rather than post-compulsory education when they finish school. The number of young people not in employment, education or training (NEET) is rising globally (International Labour Organization 2020) and is higher for young people than adults, a situation exacerbated by the coronavirus pandemic (Mathematica 2021). Future research should consider young people who move onto work rather than university, and the types of interventions that might be best suited to support this transition.

Finally, in line with concerns about reproducibility in social research, future research should assess whether the findings here are replicable in future cohorts. It should also consider which social and ecological levels have been overlooked in this analysis, and how they might be accounted for in future analysis - for example, family-level data. Ultimately, with health inequality as a wicked problem (Wistow et al. 2015), change needs to occur in a coordinated way across all domains - structural, cultural, economic, legal, political and individual levels (Alderson 2021). In order to tackle wicked problems, complexity can be reduced, not by resorting to a medical reductionist approach of breaking down the problem into smaller parts, but by “going up a level of abstraction” (Chapman 2004, p.35). In terms of school transition, this may require focusing on ecological levels: schools, families and communities, as units of analysis rather than on individual students.

10.8 Summary and conclusion

This chapter has sought to bring together the findings from the empirical chapters in this thesis. It has highlighted evidence that a number of individual-level variables are associated with a range of mental health trajectories and outcomes across the primary to secondary transition, and that students in high meaningfulness schools tend to have better mental wellbeing outcomes. Transition interventions across three different transitions were explored, with findings suggesting that their outcomes of interest tend to change as children age, and that interventions tend to rely less on parents and teachers to mediate intervention change in older cohorts.

Translating research into policy and practice involves a process of imagining possible, probable and preferable futures (Urry 2011). For ecosocial theory and critical realism, this involves considering a future where child mental health inequality has been reduced and young people are able to transition to a new school without negative impacts on their mental health. As Krieger (2001, p.672) argues, "…no aspect of our biology can be understood absent knowledge of history and individual and societal ways of living", and thus it is vital that individual mental health is viewed within the broad context of young people's lives. It is not enough to know that transition can negatively affect young people's mental health, there must be an understanding of who is most at risk and in what context (Krieger 2014). Young people live their lives within many coexisting and interacting social and ecological levels, impacted by history and political structures (Krieger 2021). Their mental health is embodied through their life experiences across all of these levels, and school transition should be considered an important window of opportunity to ensure that the health and educational trajectories set in motion support future flourishing.

11. References

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12. Appendices

12.1 Appendix 1

Due to computational complexity, it was not possible to model interactions between variables using multiple imputation. Multiple imputation was used for the main effects in line with the methods described in chapter six, but the interaction effects are based on available data and therefore a lower sample size. Interactions were only tested for the variables where data were provided by schools compared to variables based on child-report data, as the level of missingness was relatively low. No significant interaction effects were found (Table 12.1).

	Class 1 (8.65%) - High for all, increasing conduct and hyperactivity problems		Class 2 (22.75%) - Low emotional and peer problems, high hyperactivity		Class 3 (14.62%) - High emotional problems, low conduct problems	
	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
Female	0.41	[0.23, 0.73]	0.34	[0.23, 0.51]	2.04	[1.29, 3.24]
FSM	3.65	[1.67, 7.97]	1.95	[1.06, 3.60]	2.23	[0.76, 6.53]
SEN	3.63	[1.89, 6.97]	1.91	[1.09, 3.35]	2.05	[0.89, 4.73]
2 or more NLEs	4.61	[2.38, 8.94]	2.18	[1.37, 3.49]	3.07	[1.86, 5.08]
Worry	3.08	[1.60, 5.93]	1.15	[0.72, 1.84]	3.39	[2.05, 5.61]
FSM*SEN	0.63	[0.20, 2.02]	1.14	[0.38, 3.45]	0.49	[0.11, 2.13]
FSM*Female	1.21	[0.44, 3.35]	0.91	[0.36, 2.28]	0.57	[0.16, 2.07]
Female*SEN	0.76	[0.29, 2.02]	0.75	[0.29, 1.98]	0.74	[0.26, 2.07]

Table 12.1: Multinomial logistic regression models with class as dependent variable and class 4 as reference class. Odds ratios calculated for class membership given the other predictor variables. CI = confidence interval. NLEs = negative life events

12.2 Appendix 2

A change in affluence score was produced for each student, based on their Family Affluence Scale score in the first year of secondary school minus their family affluence scale score in the final year of primary school (both scales were scored out of nine). Positive values therefore denote an increase in affluence over the transition period, and negative values a decrease in affluence (Table 12.2).

Change in FAS score	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	Missing (.)	Total
Frequency	1	2	9	45	72	206	113	35	18	7	1	1	2	512

Table 12.2: Frequency of change in family affluence scores from primary to secondary school

Figure 12.1 illustrates change in affluence, with each line representing a student.

Figure 12.1: Change in family affluence between primary and secondary school by pupil

12.3 Appendix 3

Search terms were developed for Medline (below) and then adapted for the other six databases used in the systematic review.

1 Randomized Controlled Trials as Topic/
2 Randomized Controlled Trial/
3 Random Allocation/
4 Double-Blind Method/
5 Single-Blind Method/
6 Clinical Trial/
7 clinical trial, phase i.pt.
8 clinical trial, phase ii.pt.
9 clinical trial, phase iii.pt.
10 clinical trial, phase iv.pt.
11 controlled clinical trial.pt.
12 randomized controlled trial.pt.
13 multicenter study.pt.
14 clinical trial.pt.
15 exp Clinical Trials as Topic/
16 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15
17 (clinical adj trial$).ti,ab.
18 ((singl$ or doubl$ or treb$ or tripl$) adj (blind$3 or mask$3)).ti,ab.
19 Placebos/
20 placebo$.ti,ab.
21 randomly allocated.ti,ab.
22 (allocated adj2 random$).ti,ab.
23 17 or 18 or 19 or 20 or 21 or 22
24 16 or 23
25 case report.ti,ab.
26 Letter/
27 Historical Article/
28 25 or 26 or 27
29 24 not 28
30 (cohort adj (study or studies)).ti,ab.

31 Cohort analy$.ti,ab.
32 (Follow up adj (study or studies)).ti,ab.
33 exp Cohort Studies/
34 exp Cross-Over Studies/
35 exp Follow-Up Studies/
36 exp Evaluation Study/
37 (("pre?test" or pretest or posttest or "post-test" or "pre-intervention" or "postintervention" or "controlled before" or "before and after" or "follow-up assessment") and (controlled or control or "comparison participants" or "comparison group" or "usual care" or placebo)).ti,ab.
38 ("quasi-experiment*" or quasiexperiment* or "quasi-randomi*" or "quasirandomi*" or "natural* experiment" or "time series" or "interrupted time" or intervention).ti,ab.
39 ((controlled or control or intervention or comparison) adj3 (group or groups or study or trial or evaluation or cohort or cohorts or longitudinal or matched or matching or experiment or experimental)).ti,ab.
40 (trial or "randomi?ed controlled trial" or rct or "cross-over design" or "crossover design" or "cross-over study" or "crossover study" or "factorial design" or "controlled study" or "controlled design" or "single-blind" or "double-blind" or "triple-blind").ti,ab.
41 exp Controlled Clinical Trial/
42 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41
43 exp Mental Health/
44 exp Stress, Psychological/
45 exp Mental Disorders/
46 exp Anxiety Disorders/
47 exp Conduct Disorder/
48 exp Mood Disorders/
49 exp Personal Satisfaction/
50 exp "Quality of Life"/
51 exp Self-Injurious Behavior/
52 exp Self Mutilation/
53 exp Suicide/
54 exp Suicide, Attempted/
55 exp Adaptation, Psychological/

56 exp Social Adjustment/
57 exp Self Concept/
58 exp Child Behavior Disorders/
59 exp Resilience, Psychological/
60 exp Self Efficacy/
61 exp Self-Control/
62 exp Emotions/
63 exp Affect/
64 exp Depressive Disorder/
65 exp Depressive Disorder, Major/
66 exp Anxiety/ or exp Anxiety Disorders/
67 exp Happiness/
68 exp Optimism/
69 exp Hope/
70 exp Extraversion, Psychological/
71 exp Social Support/
72 exp Friends/
73 exp Social Isolation/
74 exp Loneliness/
75 exp Social Capital/
76 exp Interpersonal Relations/
77 exp Social Integration/
78 exp Social Adjustment/
79 exp Suicidal Ideation/
80 (mental health or wellbeing or well-being or selfcare or self-care or ill-being or illbeing or happiness or flourishing or eudaimoni* or eudaemoni* or eudemoni* or hedoni* or life satisfaction or satisfaction with life or panas or Warwick-Edinburgh Mental Wellbeing or wemwbs or emotional health or Psychological health or Psychological resource* or Social resource* or Psychosocial resource* or Selfesteem or Self-concept or Self-efficacy or Self-belief or Flourish* or Stress or Self-compassion or Personal resource* or Resilien* or socio-emotional or cop* or mental wellness or quality of life or self-determination or sense of belonging or sense of coherence or happy or happier or optimis* or ego strength or mastery or psychological control or self-affirmation or self affirmation or hope or conscientiousness or extraversion or purpose in life).ti,ab.

81 (state trait anxiety inventory or perceived stress scale or depression or anxiety or mental illness).ti,ab.
82 ((behaviour* or behavior* or mood or disruptive or anxiety or stress or depressive) adj3 (disorder* or condition* or problem*)).ti,ab.
83 ((emotional or psychological or mental) adj3 (distress or stress)).ti,ab.
84 (suicid* adj2 (intent or ideation)).ti,ab.
85 (self adj2 (harm or injur*)).ti,ab.
86 ((disruptive or problem or internali?ing or externali?ing or conduct) adj3 (behavior* or behaviour*)).ti,ab.
87 (social support or peer support or peer relationship* or friendship* or friend* or social isolat* or loneliness or lonely or social connect* or social network* or social capital or social contact* or social integration or social function* or social inclusion or psychosocial support or social competence or emotional intelligence or adjustment).ti,ab.
88 exp "Disruptive, Impulse Control, and Conduct Disorders"/
89 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88
90 ((school* or Primary-secondary or primary education or education* or college* or universit* or junior-high or nurser* or preschool* or pre-school* or kindergarten* or daycare* or day-care* or high-school* or primary school* or junior school* or secondary school* or secondary education or elementary school* or middle school* or secondary-university or secondary-college or school-university or school-college or higher education* or further education*) adj4 (transition* or transfer* or entr* or mov* or readiness)).ti,ab.
91 42 and 89 and 90