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SOCIAL EXPLANATIONS FOR ETHNIC DIFFERENCES IN EDUCATION

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Social Explanations for Ethnic Differences in Education

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Abstract

This thesis investigates how variations in individual social contexts account for the existence of ethnic differences in educational outcomes. Four questions are answered. First, how are school ethnic and poverty compositions associated with ethnic differences in educational progress? Second, how are individual and school cohort level religious attitudes and behaviours associated with ethnic differences in the likelihood of aspiring to university? Third, how are parenting behaviours and closed parental networks at the individual and school cohort levels associated with ethnic differences in positive schoolwork attitudes and behaviours? Fourth, how are variations in the duration of residence in England and in additional language use, at the individual and school cohort levels, associated with ethnic differences in English language proficiency?

English data from wave 1 of the Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU) and from the National Pupil Database (NPD) matched to the Pupil Level Annual School Census (PLASC) are used to answer these questions. Both datasets are used to analyse outcomes for a sample of the school cohort that turned 14 in the academic year 2009/10.

The key findings are as follows. First, increases in school ethnic minority density are associated with increased progress; increases in school average poverty are associated with decreased progress. Second, individual level religiosity is positively associated with university aspirations, but cohort level religiosity has no association. Third, positive parenting behaviours are associated with improved schoolwork attitudes, whilst parental closure has positive effects at the individual level but not at the cohort level. Fourth, the duration of residence in England is a positive predictor of English language proficiency, whilst there is no effect of using an additional language. This thesis addresses a highly relevant social issue from a novel perspective, and has important implications for both policy and future research on this topic.

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Chapter 1: Introduction

1.1 Introduction

At the beginning of 2012 there were 3.2 million students in maintained secondary schools in England, of which over 740,000 were classified as being of ethnic minority[1] origin (Department for Education 2011). The percentage of ethnic minority students in state funded secondary schools has more than doubled in the last 25 years from 11.2% in 1997 to 23.2% in 2012 (Plewis 2009; Department for Education 2012a). In state funded primary schools, the proportion of ethnic minority students of compulsory school age and above is even larger at 27.6% (Department for Education 2012a). The proportion of students for whom English is not a first language is also large and continuing to grow - 12.9% of state-funded secondary schools students were known or believed to be English as an additional language (EAL) users in 2012 compared to 12.3% in 2011; in state-funded primary schools the equivalent figures were 17.5% in 2012 and 16.8% in 2011 (Department for Education 2012a). The ethnic minority school population and the EAL school population are likely to overlap to a considerable degree, given that most students categorised as White British typically use English as a first language. As such, it is clear that the ethnic minority population (and the corresponding EAL population) in English schools is a large and consistently growing group, making the issue of ethnic differences in education increasingly salient.

[1] For the most part, the term "ethnic minority" is used in this thesis to refer to non-White British individuals living in England or the UK. More generally, "ethnic minority" is used to refer to individuals who do not belong to the numerical majority ethnic group in a country.

Much of the existing literature on ethnic minority educational outcomes in the UK suggests that there are significant disparities in attainment and progress across ethnic minority groups, and between ethnic minority groups and the majority White British population (e.g. Heath and Brinbaum 2007; Heath, Rothon et al. 2008; Lessard-Phillips 2009; Rothon 2005; Plewis 2009). These ethnic differences persist net of social class factors (Rothon 2007) and are not always ethnic disadvantages, hence the preference for the phrase "ethnic differences in education" rather than "ethnic inequalities in education" in this thesis. Given that school performance is a strong indicator of later life outcomes (Sewell, Haller et al. 1969) understanding ethnic group differences in academic progress and attainment is a good basis from which to better understand ethnic differences in later life (Plewis 2009: 3).

There is a substantial literature on ethnic differences in education, which principally focuses on individual level explanations. As will be summarised later in this introductory chapter, a large subsection of this literature aligns ethnic differences in education to social class differences in education, and argues that ethnic differences in education can be essentially explained by ethnic differences in the typical social class backgrounds of ethnic minority children. However, there is clear evidence that ethnic differences in educational outcomes persist net of individual level social class factors (Rothon 2007), suggesting that alternative explanations are needed to understand contemporary ethnic differences in education in England. The aim of this thesis is to identify some of these alternative explanations and use them to explain ethnic differences in education. These alternative explanations will be at both the individual level and at the contextual level, and will fit under the general umbrella term of "social explanations".

The Oxford English Dictionary provides a number of definitions of "social", one of which is most appropriate for this thesis:

"Developing from or involving the relationships between human beings or social groups that characterize life in society, as social behaviour, social integration, social intercourse, social norm, etc." (Oxford English Dictionary Online 2012).

This is the definition that relates to social sciences, and is the definition of "social" used in this thesis. For the sake of completeness, the Oxford English Dictionary defines "explanation" as follows:

"That which explains, makes clear, or accounts for; a method of explaining or accounting for; a statement that makes things intelligible. Also (as title), a treatise composed for the purpose of explaining." (Oxford English Dictionary Online 2012).

The combination of these two definitions should be sufficient for the reader to understand what is meant by "social explanations" in this thesis. However, in order to be confident that the reader and the author are on the same page and in agreement as to the objective of this thesis, this will be set out one final time in the following paragraph.

The objective of this thesis is to identify and test potential individual level and contextual level factors that relate to the relationships between individuals or social groups and that could account for the existence of ethnic differences in educational outcomes. The focus of the investigation is the nature of the effects these social groups and social contexts have on the student's educational outcomes.

Although social explanations are highlighted as the unifying concept to this thesis, one must not forget the relevance of individual level explanations. Ultimately, ethnic group level differences in educational outcomes exist through the aggregation of differential educational outcomes at the individual level. Therefore, explanations at the individual level

must come first, with contextual level explanations merely extending the investigation. There are four themes around which the individual level explanations explored in this thesis fit. These themes are explored separately in each empirical chapter of this thesis.

The theme of the first empirical chapter is ethnicity and poverty. In this first chapter, the existence of contemporary ethnic differences in educational progress is established, and the contribution of poverty to ethnic differences in educational progress is explored. Individual level characteristics – ethnicity and poverty – are aggregated to the school level to understand whether there are additional contextual level effects of ethnic and poverty composition of the school on educational progress.

The theme of the second empirical chapter is ethnicity and religiosity. In this second chapter, differences in religious attitudes and behaviours are tested as an explanation for ethnic differences in university aspirations. The school cohort is the relevant social group for this chapter, and so contextual effects of religiosity are tested for, alongside the cohort's ethnic, religious, and parental education composition. Additionally, school type effects (independent school and religiously affiliated school) are investigated.

The theme of the third empirical chapter is ethnicity and parenting. In this third chapter, differences in parenting behaviours and parent-child relationships are tested as an explanation for ethnic differences in schoolwork attitudes and behaviours. This chapter also specifically tests Coleman's social closure hypothesis to see whether the effects of a closed parental network (where parents know the parents of their child's friends) are robust to other parental monitoring and encouragement behaviours. A range of parental attitudes and

behaviours reported by the student are considered in this chapter, in addition to tests for effects of school cohort level social closure.

The theme of the fourth empirical chapter is ethnicity and age of arrival. In this fourth chapter, differences in duration of residence in the UK are tested as an explanation for ethnic differences in English language proficiency. This chapter has a special focus on the variation in language outcomes for first generation migrants, whilst also considering the effects of having another language on English language proficiency. In terms of the relevant contextual effects, in this chapter the focus is on average duration of residence of the school cohort. The social context of a year group composed of relatively more first generation migrants is explored to see whether such year groups experience additional contextual disadvantages. In the same way, the contextual effect of the proportion of additional language users is investigated to understand how a multilingual social context influences educational outcomes.

These brief paragraphs indicating the themes followed in this thesis are intended to give the reader an initial idea of the research to follow. Section 1.9 of this chapter will expand on these brief paragraphs to provide full summaries of the empirical chapters of this thesis. In addition, a more detailed discussion of the relevance of social contextual effects as explanations for ethnic differences in education follows in section 1.6 below. Before that, however, it is first necessary to outline the extent and salience of contemporary ethnic differences in educational outcomes in England and the UK more generally. By describing the current situation and providing examples of ethnic differences in relevant educational outcomes, it is hoped that the reader will be able to better understand the importance of, and necessity for, research into ethnic differences in educational outcomes.

1.2 Contemporary ethnic differences in educational outcomes

There are a host of examinations used to capture achievement at specific school stages over the period of compulsory education in the UK. These assessments lead to a wide range of formal educational outcomes in which ethnic differences are evident. One such highly relevant educational outcome in the UK is performance in the General Certificate of Secondary Education (GCSE) examinations. These annual Key Stage 4 examinations are typically sat in a broad range of school subjects by students at the end of compulsory education in school Year 11 (age 15/16) and are used to gain access to further educational stages or to secure employment. As such, performance in GSCE examinations is very important and relevant to the later life outcomes of young people.

Figure 1 shows recent differential GCSE performance by ethnic group (Department for Education 2012b: figure taken from p4). As can be seen, the Chinese group is the consistently high performing group, achieving well above the average in both years. Six other ethnic groups also have above average proportions of students achieving 5 or more A*-C grades at GCSE. These ethnic groups are the Indian group; the Mixed White and Asian group; the Irish group; the Other Mixed Background group; the Other Asian Background group; and the Bangladeshi group. The Bangladeshi group is notable because of its below national average performance in 2006/07, but above national average performance in 2010/11. The reasons behind the above average performance in 2010/11 of the numerically larger groups - the Indian group (12,948 cases), the Other Asian Background group (6,886 cases), and the Bangladeshi group (6,950 cases) (Department for Education 2012c: Table 1) - is of particular interest as there are sufficient case numbers to show that these above average performances are robust.

With regards to the majority group, in 2006/2007 the White British group performed at 0.3 percentage points above national average, whilst in 2010/11 the White British group achieved at the same proportion as the national average for that year (58.2 per cent). At the lower end of the distribution, below average performance in both years is seen for the following groups: the Other White Background group; the Other Ethnic Background group; the Other Black Background group; the Pakistani group; the White and Black Caribbean group; the Black Caribbean group; and the broadly defined Traveller of Irish heritage/Gypsy/Roma group. The very low achievement of the Traveller group is of particular concern, whilst the below average performance of the numerically larger groups – the Other White Background group (17,825 cases), the Pakistani group (16,423 cases), and the Black Caribbean group (8,058 cases) (Department for Education 2012c: Table 1) - also needs to be addressed.

Differential performance in GCSE examinations is just one educational outcome, used here merely to illustrate the potential for ethnic differences in educational outcomes more broadly. Other relevant (formal and informal) educational outcomes where ethnic differences may exist include progress made between educational stages, overall educational attainment and persistence in education, educational aspirations, educationally relevant attitudes and behaviours, types of educational qualifications, and subjects pursued.

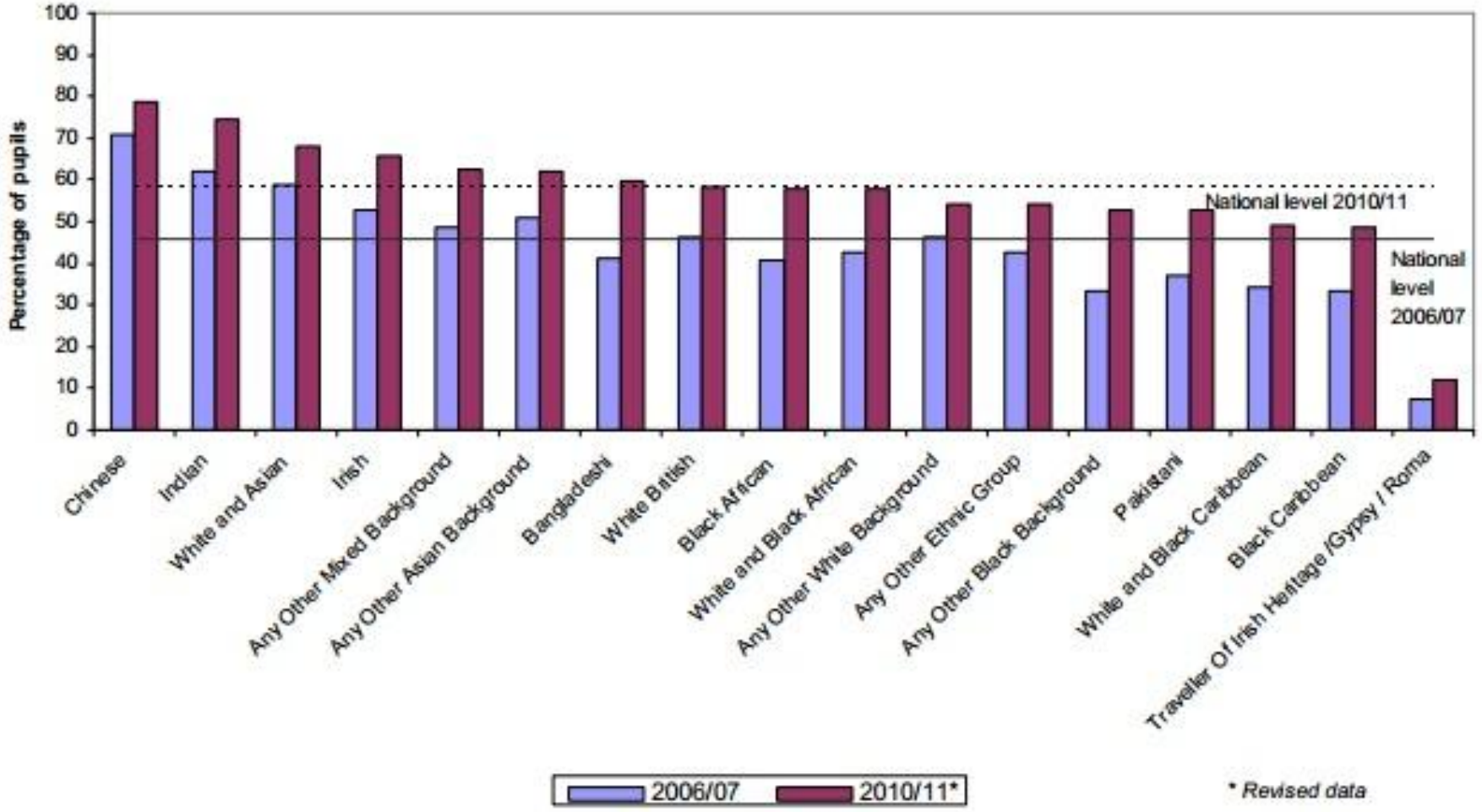


Figure 1 Proportion of pupils achieving 5 or more A*-C grades at GCSE or equivalent (including English and maths) by ethnic group, 2006/07 and 2010/11

1.3 A note on "race" versus ethnicity

Before reviewing the literature on ethnic differences in educational outcomes, a brief note on terminology is first needed. The research in this field makes common use of two terms: "race" and ethnicity. The former term is popular in the American literature, whilst the latter is preferred in the UK. The European literature favours the use of "immigrant" and "native" terminology, which is somewhat more politically loaded with its "nativist" connotations. As such, the contemporary reliance across much of the European literature on the term "immigrant" to refer to any individual of "non-native" i.e. ethnic minority background is not only out of date, but is also inaccurate when applied to individuals born in the country and belonging to the second generation and beyond.

Returning to the "race" versus ethnicity debate, according to the Oxford Dictionary of Sociology:

"Racial categorization is frequently (though not always) based on phenotypical differences; that is, differences of facial characteristics, skin colour, and so forth. But these do not correlate with genotypical differences." (Scott and Marshall 2009: online definition of "race").

The dictionary entry further notes that:

"The placing of the term 'race' in inverted commas is now seen by some sociologists as a useful way of indicating that this manner of categorizing individuals and population groups is not based on any biologically valid distinctions between the genetic make-up of differently identified 'races'."

As such, "race" is commonly conceived of as a social construct that divides people into groups according to society's conceptions of socially significant phenotypical differences, and that leads to differential treatment and outcomes according to group allocation.

In contrast to "race", ethnicity refers to:

"Individuals who consider themselves, or are considered by others, to share common characteristics that differentiate them from the other collectivities in a society, and from which

they develop their distinctive cultural behaviour. Members of an ethnic group may be identifiable in terms of racial attributes, but they may also share other cultural characteristics such as religion, occupation, language, or politics." (Scott and Marshall 2009: online defiition of ethnicity).

Whilst "race" is often defined by biological characteristics, ethnicity is concerned with shared cultural heritage and is acquired rather than inherited. This allows ethnicity and ethnic groupings to be less rigidly bounded than "races". Confusingly, the ethnic categories listed in the most recent UK Census still appear to conflate "race" with ethnicity, for example through the use of groupings like "White British" and "Black British". Thus the terminology is still not entirely clear or politically correct. In any case, in order to fit into the field where this research aims to be located, and because of the focus on the situation in England, terminology referring to ethnicity and ethnic groupings will be used throughout this thesis. Instances of "race" or "racial" language typically occur in circumstances where the cited authors have used these terms in their own work or where the focus is on America; as such, quotations will not normally be used around "race" and associated terms in these circumstances. In general, ethnicity and associated terms will always be used in preference to "racial" terminology wherever possible in this thesis.

1.4 A review of the literature on "racial" and ethnic differences in education

Academics have long investigated puzzling differences in educational outcomes across ethnic groups. Such ethnic differences are prevalent across countries, with theory and evidence coming from American, European and British literature. Work in the United States has mainly focused on disparities between African Americans and White Americans, although latterly more research involving other racial and ethnic groups (Hispanic, Asian, and Native Americans predominantly) has emerged. Looking at African Americans, the general consensus is that this group is disadvantaged (perhaps the most disadvantaged) relative to all other racial and ethnic groups. This disadvantage is present in a range of educational outcomes. In terms of achievement,

African American students generally seem to achieve less than their White American counterparts (Zand and Thomson 2005; Card and Rothstein 2007; Ainsworth-Darnell and Downey 1998). In terms of aspirations, the evidence is more mixed, with some studies suggesting African Americans have lower educational aspirations than almost all other ethnic and racial groups in America (Kao and Thompson 2003), whilst others suggest that their aspirations and school attitudes are as positive as other ethnic groups, if not more positive (Goldsmith 2004; Ainsworth-Darnell and Downey 1998). The position on delinquent behaviour is slightly less mixed with research suggesting that African Americans are disproportionately more likely to participate in delinquent behaviour, drop out of school early, and experience teenage pregnancy (Wilson 1987; Crane 1991). However it is important to note that African Americans also tend to be socioeconomically disadvantaged and thus concentrated in more deprived neighbourhoods, which may better explain delinquent behaviour (Crane 1991). Regarding attitudes towards integration, the main theoretical work comes from Ogbu, who claims that African Americans (and other involuntary migrant groups) reject assimilation into the mainstream culture, at least in terms of schooling. Assimilation is different to integration but it is plausible that negative attitudes towards assimilation may be associated with educational disadvantage.

As mentioned previously, whilst most of the work has centred on African Americans, there is some literature on the experiences of other ethnic minority groups. Research into the outcomes of Hispanic students is growing, although one must be cautious in combining the many different groups of Hispanic origin into one more generalised category. In fact, it seems that there is as much variation in outcomes within the Hispanic group as there is between the Hispanic group and other ethnic groups. As such, it is difficult to generalise the findings. Some empirical work

on segmented assimilation suggests that middle class Cubans and Puerto Ricans do comparatively well, whilst Mexicans and Haitians experience similar outcomes to African Americans (Rumbaut and Portes 2001; Portes and Rumbaut 2001). Native Americans too seem to be at a disadvantage in achievement and aspiration outcomes and also seem to be marginalised socially (Kao and Thompson 2003).

The real success stories of American migration are the Asian groups – particularly the Chinese and Indian groups. Both these groups have the highest academic performance (Kao and Tienda 1995; Goza and Ryabov 2009), the highest propensity to complete university education (Frost 2007), and the lowest rates of delinquency (Portes and Rumbaut 2001). In terms of attitudes towards integration, these groups are known for social closure, especially the protection of youth from racism and discrimination, and also strong cultural transmission (Gibson 1988). As such, these groups seem to keep themselves separate from the mainstream and so may not have positive attitudes towards integration. Again it is worth noting that not all Asian groups are experiencing the same success. Some groups, such as the Laotians, Cambodians, and Vietnamese face more of a struggle than their Chinese and Indian peers (Rumbaut and Portes 2001).

Work in Britain is rather different to that in America, perhaps because a broad spectrum of ethnic minority groups have established themselves in Britain over the 1900s and so the American Black-White dichotomy is not so keenly felt. The ethnic groups that tend to be studied in the literature are Black African, Black Caribbean, Indian, Chinese, Pakistani, Bangladeshi, and White British (the ethnic majority group). The Mixed ethnic category is growing rapidly and is estimated to be one of the groups with the biggest increase in the next forty year (Rees 2010). The general consensus is that the Black Caribbean, Pakistani and Bangladeshi groups are relatively disadvantaged in terms of academic achievement and aspirations (Strand and Winston

2008; Rothon 2005), with the finding seeming to apply especially to boys (Gillborn and Mirza 2000). Gillborn and Mirza (2000) suggest that social class is intrinsically connected to the disadvantage faced by these groups. This disadvantage is not newly discovered – earlier studies of ethnic disparities in education also identified West Indian and Asian groups achieving at a lower level to their White peers, but suggested that some Asian pupils did catch up over their secondary school years (Smith and Tomlinson 1989)[2]. In another study, Tizard and colleagues looked at inner London infant school children and found Black girls were the top performers in reading and writing, whilst Black boys were the bottom performers, and that White boys and girls were in between these groups (Tizard, Blatchford et al. 1988). In contrast, in maths, gender differences were greater in the White group than in the Black group, with White boys making the most progress in maths during infant school and both Black and White boys making more progress than Black and White girls. Tizard and colleagues early work highlighted the importance of considering gender, school subject, and progress (rather than just attainment) when looking at ethnic differences in education.

Returning to the Smith and Tomlinson paper (Smith and Tomlinson 1989), the authors found that, in absolute terms, children from ethnic minorities generally achieved lower exam results in their fifth year of secondary school (Year 11) than White children, but in relative terms they did better as their results were significantly higher than would have been predicted by tests the children took in their second year of secondary school (Year 8). Of further interest in their paper is the variation in progress across subjects, with South Asian children making good progress

[2] The ethnic grouping terms used in this sentence and the following sentences are as in the respective papers cited here. This terminology reflects the time period of these papers but is now out of date.

during secondary school in both maths and English and also across their other subjects, while children from other ethnic minority groups generally caught up in English and the other subjects but not in maths. The authors further note that there are wide attainment disparities between specific Asian groups. The results put forward by Smith and Tomlinson are robust because they use a nationally representative sample of both White and ethnic minority children and they follow and study these children over time using the same methods and approaches for all the students. This allows better understanding of the attainment and progress of White and ethnic minority children.

Considering the current context, it seems plausible that the increase in African migration since the Smith and Tomlinson study may now mean that there are also wider attainment disparities in the Black African group than there were previously due to the greater variation in current African migrants compared to earlier post-war migration. It is worth noting that this research found that the variation in attainment attributable to ethnic group membership was much smaller than the variation attributable to between school differences. Put more simply, Smith and Tomlinson attribute more ethnic disadvantage to the school the child attends, suggesting that this makes much more difference to academic achievement than their ethnic group, and arguing school effects are stronger than individual level ethnicity effects. As such, school differences seem to be a bigger driver of differences in student attainment than ethnicity.

Smith and Tomlinson's results support the earlier work by Rutter and colleagues (1979) that students of similar social backgrounds and prior attainments who attend different schools end up with substantially different school exam results. Smith and Tomlinson's findings also support the idea that all children do better in schools with higher proportions of higher attaining students. Thus if ethnic minority children are disproportionately concentrated in schools with fewer higher

attaining students and with slower progress, then this could contribute to an explanation for ethnic minority underachievement (Tizard et al. 1988).

Alongside research on general ethnic inequalities in education, there is evidence showing substantial residential and school ethnic segregation. Johnston and colleagues (2007) find that there is significant clustering of ethnic minority groups within certain geographical areas, particularly for the Indian, Pakistani and Bangladeshi groups. Black students are also relatively concentrated. Ethnic minority students are additionally concentrated within certain schools (Burgess, Wilson et al. 2005; Burgess and Wilson 2005). The level of ethnic segregation in schools is higher than the level of residential segregation in the same areas and this is particularly noticeable in urban areas, apart from in London where residential segregation is greater (Johnston et al. 2007). The reason for this higher level of ethnic segregation could be because of parental choice, either through the "white flight" of White British families leaving areas of high ethnic minority concentration, or through the more general choices parents make about the schools to which they send their children.

Whilst there are reasons to speculate that the ethnic minority attainment gap may be widening for some groups, there are is also evidence that the ethnic minority disadvantage may be declining for others. For example, Plewis (2009) states that apart from the Black Caribbean group, ethnic minority students of both sexes are doing well at Key Stage 2. The Chinese and Indian groups are ahead of the White British group at Key Stage 2, and also make more progress than the White British group, as do all the ethnic minority groups bar the Black Caribbean group. Similarly, Hamnett, Ramsden and Butler (2007) show that, after controlling for social background using MOSAIC neighbourhood type, Chinese, Indian, Black African, Bangladeshi, Asian Other, and Other ethnic group students perform better than expected, whilst Black Other,

Black Caribbean, Pakistani, and White British students perform worse than expected. They suggest that social background is generally a slightly more important explanation of educational attainment than ethnicity. This is further evidence that ethnic differences in education are not necessarily disadvantages – some groups are doing better than would be expected and are outperforming the majority White British group.

Looking beyond differences in academic achievement and progress, ethnographies of Black Caribbean (Sanders 2005) and Asian (Pakistani and Bangladeshi) youth (Alexander 2000) also suggest higher involvement in delinquent and criminal behaviour, although as with American research, these studies focus on inner-city youth, who may be quite different to their more advantaged same ethnicity peers. As in America, it seems that the Chinese and Indian groups in Britain outperform the other groups in terms of academic achievement and aspirations for educational attainment; a substantial gap between these two groups and the other groups has persisted for a number of years now (Rothon, Heath et al. 2009; Heath et al. 2008; Stevens 2007). Again, not as much work has been done regarding attitudes towards integration or delinquent behaviour, although the relative absence of delinquency studies focusing on Chinese and Indian youth could be considered an indicator of their comparably low participation in such behaviour.

It is worth noting that there is increasing concern over the outcomes of White British students, again especially boys, in Britain today. In terms of educational progress, achievement and aspirations, the White British are lagging behind (Strand and Winston 2008). This worrying trend also seems to apply to attitudes towards integration, with a great many White British students growing up entirely apart from ethnic minority students and developing attitudes and participating in behaviours that are prejudiced and discriminatory (Cline, de Abreu et al. 2002).

The overarching factor behind much of the empirical work on race and ethnicity in Britain is still social class (Haque and Bell 2001), and so this must also be considered as a source of differentiation amongst young people in Britain today, rather than just race and ethnicity alone. However, this thesis will look for alternative explanations of ethnic differences in education aside from those based on solely on social class differences. This is because social class theories do not fully explain ethnic differences in education (as is expanded upon in the following section) and so explanations beyond those focusing on social class differences are necessary.

This section has introduced and summarised the key literature on past and present ethnic differences in educational outcomes in the UK and abroad. Each empirical chapter includes additional literature relevant to the specific research questions investigated in that chapter. The following section describes how theories of social capital and context can be applied to explain ethnic differences in education. After outlining the relevant theories and connecting them to the specific social situations this thesis focuses upon (the family, the school, and the religious community), some key empirical pieces, and their findings, are discussed.

The literature in this field is rich but such work has rarely been combined in the way this thesis brings together social context based explanations for ethnic differences in education. The literature informs much of the work presented in this thesis and guides the empirical work in the upcoming chapters, although weaknesses and absences in the literature are addressed where possible to ensure this thesis contributes to the field and provides a decent exploration of how social explanations can be used to understand ethnic differences in education.

1.5 Theoretical summary part 1: structural and cultural explanations for ethnic differences in education

In a special issue of *Ethnicities* dedicated to the explanation of ethnic inequalities in education, Heath and Brinbaum (2007) emphasise the persistence of ethnic differences in educational outcomes and highlight its salience in contemporary society. They argue that traditional explanations of ethnic differences in education have attributed these inequalities to social class. Theories of social class inequalities have been used to explain the lower educational outcomes of some ethnic groups, such as the Pakistani, Bangladeshi, and Black Caribbean groups, because of the typically lower SES composition of these ethnic groups. Structural explanations for social class based educational inequality propose that individuals make decisions based on the costs and benefits of each available choice, contingent on the resources available (e.g. Breen and Goldthorpe 1997; Breen and Jonsson 2005; Boudon 1974; Halsey, Heath et al. 1980). Individuals who are lower down in the social class hierarchy are less likely to persist in education because the costs outweigh the benefits, or because they do not have sufficient resources to continue in school. Cultural explanations posit that social class based educational inequalities arise because some individuals have the appropriate knowledge and cultural resources to gain an advantage in education (as they know how the education system works and how to make the system work in their favour), whilst other individuals do not have these cultural and knowledge-based resources (e.g. Bourdieu and Passeron 1977; Willis 1977). There is again a social class hierarchy in terms of who has these cultural resources, with lower social class positions being associated with fewer necessary cultural resources.

Ethnic minorities may be penalised because of culture twice-over: firstly because of their typically lower social class position; secondly because of the differences in cultural background

and experience associated with belonging to an ethnic minority group. This second type of cultural difference is also known as cultural dissonance and is thought to additionally contribute to ethnic inequalities in education on top of the negative effects of "low" cultural capital associated with lower social class positions. Cultural dissonance refers to the difference, and resulting difficulty, that arises when cultures meet. As such, dissonance is particularly experienced by first generation migrants, who have lived in one cultural environment and then migrated to another. However, it is plausible that dissonance is experienced by second and later generation migrants, as a result of experiencing different cultural environments within the home and outside of it. Host-country language difficulties in both the parental and the child generation can also be considered a form of cultural dissonance, and so can be hypothesised to contribute to ethnic differences in education.

There is empirical evidence to support the claim that low social class positions explain some ethnic disadvantages in education. For example, Fekjaer (2007) notes that the educational disadvantage experienced by Pakistanis in Norway is largely due to their lower social class position. Rothon (2007) finds similar evidence to explain Pakistani and Caribbean disadvantage in England and Wales, although she notes that social background only explains just over half of Pakistani under-performance in exams, and nowhere near as much of the educational disadvantage experienced by Caribbean boys. Rothon also finds that the educational disadvantage experienced by Bangladeshi and Pakistani students can be attributed in part to cultural dissonance i.e. differences in cultural experiences across the social environments in which children live.

An alternative cultural explanation frequently used to explain the underachievement of Black students is the oppositional culture explanation. More specifically, oppositional culture theory

focuses on the achievements and attitudes of African American students at school in America. The theory suggests that African American students perform poorly in school because they are alienated from, discriminated against, and rejected by the mainstream White American school system. African American students' norms, values, and identities are changed through the interactions they have with the majority population. The consequence of this is that African American students develop a reactive ethnic identity and create their own counter-culture that rejects the norms, values, and attitudes of the mainstream school system – this is their oppositional culture. Oppositional culture allows African American students to give status to the aspects of school and their lives that they succeed in, but this is often at the expense of conventional educational success. It also may incorporate anti-school behaviour and an active resistance to the mainstream culture. Oppositional culture theory was originally put forward by John Ogbu, with empirical evidence for the theory coming from a range of sources (Fordham and Ogbu 1986; Ogbu 1991b; Ogbu and Simons 1998; Ainsworth-Darnell and Downey 1998). There are parallels between Ogbu's arguments and those put forward by Willis and others when describing working class resistance to schooling (Willis 1977; for a review see Finn 1999) and also those put forward by early criminologists when describing criminal subcultures (e.g. Cloward and Ohlin 1960). However, Ogbu's focus is on educational resistance by involuntary ethnic minorities rather than voluntary ethnic minorities. Ogbu describes African Americans as involuntary minorities because of their forced migration through slavery. He acknowledges that the United States is a special case because of its history of slavery and corresponding legacy of turbulent Black-White relations. As such, oppositional culture theory may not be as readily applicable in England as inter-group relations are different those in America and the voluntary/involuntary minority distinction is not as relevant. Nevertheless, British researchers

have also argued that Black British students resist and reject the formal education system, perhaps because of racism and discrimination within the system (Mac an Ghaill 1988; Youdell 2003).

However, social class and wider cultural explanations for ethnic inequalities in education do not explain everything. They fail to adequately account for the educational advantages and success in education experienced by some individuals despite socioeconomic disadvantages. This is especially the case for the "model minority" group, the Chinese, who frequently experience socioeconomic disadvantage in the first and second generations, but achieve exceptional outcomes in education[3]. Further, whilst social class explanations seem to adequately explain educational disadvantage for students of European origin, they fail to explain the educational disadvantage experienced by non-White minorities and by the most socioeconomically disadvantaged groups (Heath and Brinbaum 2007). That is, ethnic differences in education persist for some ethnic groups even after social class has been accounted for.

1.6 Theoretical summary part 2: social explanations for ethnic differences in education

The two sets of explanation put forward above do reasonably explain some of the ethnic differences in education that are evident in the data. But there is still too much unexplained variation in educational outcomes across ethnic groups for these explanations to suffice. This thesis looks at the role social explanations can play in terms of explaining ethnic differences (both advantage and disadvantage) in education. The term "social explanation" is used broadly in

[3] One proposed explanation for such educational advantage is the greater positive selection of the immigrant generation (Heath and Brinbaum forthcoming; Feliciano 2005).

this thesis to refer to explanations relating to characteristics and dimensions of an individual's social context. Ideas from two broad groups of theories – social context and social capital - will be drawn upon and combined under the label of "social explanation" in this thesis. They will be combined because these ideas share a common conceptual framework in that it is the people and the organisations around an individual (the individual's social environment), and the interactions between the individual and the components of their social environment, that influence outcomes. Social explanations are offered as an addition to individual explanations, which focus on characteristics of the individual themselves rather than on their social environment. The two sets of theories that the term social explanation will be used to cover – social capital and social context – will be expanded upon below.

1.6.1 Social context

The first theoretical perspective is that of contextual effects. The ideas around contextual effects were developed by the Columbia school (Kendall and Lazarsfeld 1950; Merton and Kitt 1950; Berelson, Lazarsfeld et al. 1954; Lazarsfeld, Berelson et al. 1944) and were used as a framework to better understand how aggregated characteristics of a group might influence the outcomes of individuals who belong to those groups (particularly with regards to voting behaviour and in the military). Rather than neighbourhood effects that operate at the *individual level* i.e. through pure peer effects between individuals, contextual effects focus on the *aggregate level* characteristics of the social context to which individuals are exposed. Measures of the social context are typically aggregated characteristics of the individuals belonging to the group (e.g. percentage of females in a school; proportion of non-White students in a school; proportion of students receiving free school meals). Contextual effects research looks at how these group level characteristics have effects at the individual level.

The existence of contextual effects has led to hypothesising over explanations for the variation in outcomes for similar individuals in different social contexts. The competition hypothesis (Blalock 1956; Blalock 1957; Hawley 1944) is one theory that has arisen from the study of contextual effects. The competition hypothesis posits that higher densities of the minority group[4] lead to lower outcomes for members of the minority group because of the negative reactions of the majority group (Albrecht, Albrecht et al. 2005). This negative reaction of the majority population is triggered by inter-group competition for resources and the threat of a rise in minority power (Blalock 1967). The competition hypothesis was derived from research on ethnic inequalities in the labour market, but it is easy to see how the theory can be applied to the school context by testing whether higher proportions of ethnic minority students are associated with lower or higher outcomes for ethnic minority students. It is, however, not easy to test whether any negative outcomes are caused by a negative reaction from the majority population. Further, in the school context, it is difficult to directly test whether lower outcomes in schools with higher proportions of ethnic minority students are due to increased competition by students over resources, or to the effects of perceived threat by the majority group, or to something else entirely. Without detailed data on the underlying mechanisms, any negative associations found between school ethnic minority concentration and negative educational outcomes cannot necessarily be used in support of the competition hypothesis.

Alternative theories that fit into the broad remit of contextual effects are Crane's theory of epidemics, and the immigrant density hypothesis (Szulkin and Jonsson 2007). Crane (1991)

[4] Minority group does not refer solely to ethnicity – rather, the minority group can be any group that is in a numerical minority according to the salient social cleavages in environment under consideration.

expands on Jencks and Mayer's (1989) contagion model of delinquent behaviour by introducing the idea of epidemics, whereby delinquent behaviour spreads rapidly across the neighbourhood once a certain threshold of low SES residents has been reached. Similar to Crane's theory is the immigrant density hypothesis, which posits that higher concentrations of immigrants in neighbourhoods and schools lead to higher concentrations of immigrants in children's peer groups, which is in turn negatively associated with academic outcomes due to the lower average socioeconomic position of first generation immigrants and also problems with language acquisition (Szulkin and Jonsson 2007). The immigrant density hypothesis further attempts to explain how immigrant concentration may be detrimental to academic outcomes – namely through a lack of opportunities, information, and role models (Elliott, Menard et al. 2006).

Theories of compositional and contextual effects, especially those concerning race and ethnicity, are more mixed and divided in their opinions on how ethnic composition might influence social and cultural preferences. Therefore, there is still much theoretical and empirical ground to cover in order to realise a coherent theory with sound empirical backing.

Some common critiques of contextual effects research include the difficulty in identifying the mechanisms through which contextual effects may arise, and also problems of measuring selection effects with regards to non-random selection into the groups under investigation. These issues will be expanded upon later in this chapter.

1.6.2 Social capital

The second theoretical perspective comes from the literature on social capital (Coleman 1988; Granovetter 1973), and its extension, ethnic social capital (Portes 1998a). Social capital theory proposes that individuals are not isolated but instead belong to networks of others, who provide

resources, information and influence across the network. As such, the outcomes of individuals can be affected by the connections they have with others. In particular, access to the resources held by others is highlighted as a way individuals can advance, especially in terms of education. Social capital theories have been used to explain the differences in outcomes experienced by the children of immigrants of similar SES positions (e.g. Zhou and Bankston 1994; Bankston, Caldas et al. 1997). In such explanations, the family and community social relations of ethnic minority children are perceived as "forms of investments that yield pay-offs in school" (Bankston 2004: 176) and that are particular to ethnic minority groups, leading to the conception of "ethnicity as social capital" (Bankston et al. 1997).

Theories of family social capital tend to refer to parental involvement in their child's activities and parent-child relationships. Strong and positive parent-child relationships are theorised to be particularly important as otherwise children are unable to access parental human capital resources (Coleman 1988; Coleman 1990). Social capital can be sourced from the family as the family system involves "shared norms and feelings of belonging, as well as social support, and increased connections" (Parcel, Dufur et al. 2010: 830). Family social capital may contribute to child socialisation through the time and attention parents give to their children, through monitoring and supervising children's activities, and through the promotion of child well-being (Dufur, Parcel et al. 2008; Parcel and Dufur 2001a; Parcel and Dufur 2001b; Hoffmann 2002; Kim and Schneider 2005). Family social capital theorists also argue that parental social connections with, for example, neighbours and work colleagues, can be useful for their children (Crosnoe 2004; Johnson, Crosnoe et al. 2001; Dufur et al. 2008).

One of the most interesting theories of parental involvement is Coleman's (1988) theory of intergenerational social closure. Closure in a network is meant to be advantageous to the

individual belonging to it as it implies members communicate with each other and share information, making it easier to enforce common norms and expectations through the use of sanctions and rewards (Coleman 1990). The theory of intergenerational social closure hypothesises outcomes in a specific instance of network closure. Specifically, the theory posits that closed social networks between a child, the child's friends, the child's parents, and the parents of the child's friends provide educational advantages. Closed networks allow norms to be consistently reinforced across social contexts and to ensure children meet expectations and fulfil obligations through close monitoring by the adults involved in the child's life. Bounded networks among parents, other relevant adults, and children enable adults

"to establish norms and reinforce each other's sanctioning of the children" (Coleman 1990: 318).

Strong networks are not enough however; also relevant are the norms, values, and expectations that are conveyed through that network. In his earlier work, Coleman (1987) suggested that norms for academic success may vary across ethnic groups. As such, it is plausible that both norms for academic success and levels of intergenerational social closure vary across ethnic groups, and combine to contribute to ethnic differences in education. The theory of intergenerational social closure is explicitly tested in chapter 4 of this thesis.

Theories of ethnic and religious social capital focus on the role of social capital within ethnic and religious communities, and suggest that there are extra social capital bonuses to be gained by members of ethnic or religious groups, over and above the social capital that is available without looking at particular group membership. This extra ethnic or religious capital is thought to often, at least partially, compensate for the restricted information and resources available from mainstream society. Religious social capital is formed within religion institutions and is expected

to have a positive effect on educational outcomes because religious institutions are centres where children and their families can join closed and intimate social networks (Zhou and Bankston 2002). Religious institutions may be able to compensate for a lack of social closure or family-based social capital by promoting norms and behaviours and providing channels of information flow that result in school success. This is hypothesised to occur because religious institutions are social settings where norms and values are consistent and where members can be supported and encouraged to pursue outcomes that are aligned with the cultural values of the rest of the religious community.

In the same way, the transmission of religious attitudes and behaviours to young people may encourage social conformism and provide opportunities to connect the student to the ethnic and religious community, which may in turn lead to educational advantages. This may particularly be the case because religious institutions have members across all generations, ages, and social classes, thereby reducing segregation and allowing useful ties to be created between those that have resources and those that need them (Bankston and Zhou 1995; Ebaugh and Chafetz 2000). Ties between adults and adolescents that are not family members may be better fostered in religious communities, providing access to social capital. Such intergenerational ties reinforce the religious (and potentially also ethnic) community's norms and allow expectations to be consistent across the group.

Looking at ethnic social capital more generally, for ethnic minority students, attendance at a school where their group is the majority may allow increases in ethnic social capital for them, such as through extra teaching from older peers or better information on the education system. This increase in in-school ethnic social capital may provide educational benefits. There may also be educational benefits to be gained through access to in-school social capital more generally,

regardless as to whether it is linked to ethnicity. As such, students who are isolated from both ethnic peer groups and networks of majority ethnic group students may suffer negative outcomes as a result of this social capital deprivation.

In summary, this thesis will combine theories and ideas from the social context and social capital literature under the label of "social explanations", and then use these explanations in addition to individual factors to try to explain ethnic differences in educational outcomes in the UK.

1.7 A note on mechanisms

Given the focus of this thesis on social explanations for ethnic differences in educational outcomes, a note on the potential mechanisms that underpin any associations between social context and educational outcomes is necessary. For the most part, the intricacies of the actual relationships between the young people studied in this thesis and their relevant others and salient social contexts are unknown. Instead, the existence of such relationships – such as those between a student and his schoolmates, teachers, parents, and community members – are taken as given. Fundamental to the assumption that there are social interactions between a student and other actors is the further assumption that these interactions can actually influence the student's outcomes. This influence transmitted through these interactions operates through underlying mechanisms.

There are a number of proposed mechanisms that could potentially explain the associations found in this thesis. These mechanisms are only proposed, however, and not tested in this thesis, due to the lack of suitable data and the difficulties in parsing out these mechanisms from the data available (the exception being chapter 4, where some of the mechanisms expected to operate through religiosity are explored). As such, this section of the thesis is included to provide a

deeper level of theoretical explanation for the reader and to posit as to how the observed empirical associations may have arisen.

Before discussing potential mechanisms, it is first necessary to define what is meant by a mechanism and summarise why mechanisms are important in sociology. As noted in *The Oxford Handbook of Analytical Sociology* (Hedström and Bearman 2009) there are numerous, overlapping definitions of a mechanism. However, these different definitions all have in common:

"an emphasis on making intelligible the regularities being observed by specifying in detail how they were brought about." (Hedström and Bearman 2009: 5).

Thus a mechanism can be thought of as a detailed explanation of the process by which the observed pattern of association has come about. With regards to this thesis, proposed mechanisms are hoped to provide an explanation as to *how* social processes within the school social context affect educational outcomes.

Why are mechanisms important? Again it is worth turning to Hedström here and noting the argument he put forward with Swedberg that:

"the advancement of social theory calls for an analytical approach that systematically seeks to explicate the social mechanisms that generate and explain observed associations between events." (Hedström and Swedberg 1998: 1).

In other words, for sociological theory to make progress and to have any relevance in broader society, it must be able to explain social situations.

Hedström and Swedberg (1998) define three types of mechanisms. The first type is the situational mechanism, and is used to explain how individuals are affected by exposure to specific social situations. With regards to the school social context, one proposed situational

mechanism that is likely to contribute to ethnic differences in educational outcomes is school policy. If schools systematically vary their policies according to the composition or characteristics of their students, then ethnic differences in educational outcomes may result. For example, schools with many non-English language speakers may initiate policies for teachers to focus on English language learning, leading all students in that school to have lower outcomes in other subjects because of the increased focus on learning English. In the same way, schools with relatively larger intakes of first generation migrant students may implement policies to ease their integration, which may be at the expense of alternative policies that better suit students born in England. Another example concerns school admissions policies, whereby schools may (covertly) choose to admit certain types of students (e.g. middle class or higher income students) as these students are more likely to perform better in national examinations, thereby helping the school to improve their league table position (for a recent report on this practice see The Academies Commission 2013). In these examples, students may respond to the policy in an individual way, but their behaviour is correlated and driven by their shared exposure to the same social situation i.e. the same school policy.

The second type of mechanism is the action-formation mechanism, which is concerned with how individual beliefs, desires, and opportunities combine to result in a certain action. This type of mechanism is less relevant to contextual level explanations, but contributes to individual level explanations to ethnic differences in educational outcomes. One example of such a mechanism is that of "immigrant optimism", whereby immigrant students have higher levels of motivation, drive and ambition than ethnic majority students, which when combined with the desire of immigrant students to succeed in the destination country leads to better performance in school (Kao and Tienda 1995). Another example concerns the mechanisms proposed to explain the

positive effects of individual level religiosity on aspirations. These mechanisms are a student's internal locus of control, work ethic, and avoidance of troublesome behaviour. It is proposed that religious students have certain beliefs about how they should behave (the three mechanisms proposed above), which shape their educational actions and thus their educational outcomes.

The third type of mechanism is the transformational mechanism and describes how individual interactions with others results in a collective or shared outcome. Such interactions can take place in the family, such as those proposed by Coleman in his intergenerational social closure hypothesis. In this hypothesis, interactions between parents, children, their friends, and their friends' parents result in improved monitoring of youth behaviour and the reinforcement of norms that are conducive to educational success. Parenting behaviours more broadly can be driven by transformational mechanisms. In a similar way, interactions between individuals who are members of an association or group may provide access to social capital or resources that would be otherwise unavailable to the individual. Religious or ethnic social capital may be accessed in this way.

This third type of mechanism closely maps on to the peer effects literature, whereby students' interactions in the classroom or school are predicted to influence each other's outcomes. For example, interactions between students in the same classroom or school may lead to the transmission of high aspirations. With regards to ethnic differences in educational outcomes, students may do better in schools with more ethnic minority students if ethnic minority students have higher educational aspirations, as these aspirations are transmitted and reinforced through repeated interactions amongst students in the school, leading to better outcomes for all students.

Teacher behaviour may also affect differences in educational outcomes through a transformational mechanism if the way teachers interact with students varies according to ethnicity or income. For example, if a teacher has low expectations of poorer students, then that teacher's interactions with poorer students may be less academically challenging. If the teacher then maintains the same type of interaction with all students in that class, expectations can be lowered for all students. In such a situation, students could also suffer from stereotype threat (Steele and Aronson 1995), although the mechanism underlying stereotype threat is more specifically described as a self-fulfilling prophecy (Merton 1948; Biggs 2009).

As discussed earlier in this section, it is not possible to test for (most of) these proposed mechanisms explicitly in this thesis. However, the suggested mechanisms seem feasible and realistic potential explanations for the sorts of relationships identified in this thesis. Further work with longitudinal data may be better able to identify causal pathways and better explain the patterns seen in this thesis.

1.8 Outline of the thesis

This section will outline the thesis beginning with the aims and objectives of the project, then specifying and justifying the research questions, outlining the data and methods, and finishing with a summary of the methodological and other limitations of the research.

1.8.1 Aims and objectives

The aim of this thesis is to examine and explain ethnic differences in education from a social context perspective. Conventional explanations of the differences in educational outcomes experienced by students of different ethnic groups focus solely on individual level explanations, such as differences in aspirations and motivations, or attribute ethnic disadvantage to the socio-

economic disadvantage faced by the parental generation. There is also a considerable body of literature that accounts for ethnic differences in education to cultural differences between ethnic groups[5]. This literature suggests that it is the norms, values, and cultural practices of some ethnic groups that allow them to get ahead in education, whilst other ethnic groups struggle behind because their culture does not provide the same benefits (e.g. Flew 1986; Sowell 1981; Scruton 1986) or because their culture is oppositional (Ogbu 1978; 1991a). This thesis aims to look at the question in a different way by suggesting that cultural differences actually amount to differences in social context and social capital. The thesis argues that it is not just that cultural norms and values that vary across ethnic group, but that there are also differences in the social contexts in which students from different ethnic minorities live their lives, and differences in the way they can and do access cultural and social resources. Therefore, this thesis acknowledges the relevance of individual characteristics and factors but proposes that social factors may add to the explanation.

This thesis involves a direct investigation of the presence and influence of various contextual effects - specifically the ethnic and poverty compositions of schools, the religious attitudes and behaviours of the school cohort, the extent that students belong to cohorts with closed parental networks, and the language proficiency and duration of UK residence of peers. The main sources of data for the empirical research chapters are the National Pupil Database (NPD) matched to the Pupil Level Annual School Census (PLASC) (Department for Education 2009; Department for Education 2007) for chapter 2, and wave 1 data from England from the Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU) (Kalter, Heath et al. 2013) for

[5] Unmeasured selection effects may have also been mistakenly attributed to cultural differences.

chapters 3, 4, and 5. These are both large-scale datasets containing the necessary information about young people living in England needed to answer the research questions put forward in this thesis.

This research will examine how specific individual and social contextual factors affect the educational outcomes of interest and how they can be used to explain ethnic differences in educational outcomes. In this way, this thesis intends to identify both individual level and contextual level explanations for the persistence of ethnic differences in education.

1.8.2 Research questions

This thesis will answer the following four research questions:

1. How is the school social context in terms of the ethnic composition and poverty composition of the student population associated with ethnic differences in progress in maths and English between the ages of 11 and 14?
2. How are individual and school cohort level religious attitudes and behaviours associated with ethnic differences in the likelihood of aspiring to university?
3. How are parenting behaviours and closed parental networks (intergenerational social closure) at the individual and school cohort levels associated with ethnic differences in positive schoolwork attitudes and behaviours?
4. How are variations in the duration of residence in England and in additional language use, at the individual and school cohort levels, associated with ethnic differences in English language proficiency?

1.8.3 Relevance of research questions

The research questions I propose above are salient for four main reasons. The first reason concerns the general increase in migration and growth of ethnic minority populations in England (Office for National Statistics 2001; Office for National Statistics 2012b). The ethnic minority populations living in England are spread across the country, although there is a certain degree of geographical clustering of the different groups and also a general preference for habitation in cities. These groups continue to grow at different rates and they are also very diverse with regards to many other aspects such as average year or decade of arrival, average socioeconomic status, average migration status, and the political and economic contexts they have lived through. It is important to study ethnic differences in educational outcomes as they will become increasingly salient as the ethnic population in the UK grows.

The second reason concerns the community cohesion and integration agenda proposed by the Government (e.g. The Community Cohesion Panel 2004; Department for Communities and Local Government 2010). These agendas follow on from the increase in migration and growth in ethnic minority populations. There are aims to integrate different communities and people from various backgrounds so as to improve the quality of life for society in general (Department for Communities and Local Government 2009). Schools are important here because often they are the first places where individuals are exposed to people who are different to themselves and their families. Further, schools, religious meeting places, and families are important sites because they are places where norms, values, and beliefs are shaped. With regards to integration then, it is important to study how the social context in schools, religious institutions, and families contribute to structural integration in the form of educational success.

The third reason concerns the differential achievement of ethnic minority students, both when compared to White British students, and when compared to other ethnic minority groups. Ethnic stratification has been well discussed in the literature (e.g. Heath and Brinbaum 2007; Kao and Thompson 2003) with a substantial amount of work carried out in England (Drew 1995; Demack, Drew et al. 2000). In the British case, some ethnic minority groups, like the Chinese and Indian groups, out-perform the White British majority, whilst other groups, such as the Black Caribbean group and the Bangladeshi group, seem to lag behind the average (e.g. Rothon 2007). The research questions will help find out whether these differences in attainment across ethnic groups are associated with differences in social context and social capital.

The fourth reason is that it is worthwhile generally to investigate social capital and social context based effects further, and especially find out if there is an ethnic dimension to these effects. Past work on social capital has yet to conclusively determine whether there are additional effects of social capital that operate through ethnicity. It is also useful to advance the understanding of how social capital and context effects work in terms of mechanisms and pathways of action. Much work has already been done in this sphere but results are still mixed and so these research questions will help improve the understanding of these effects. It is worth noting that whilst the four reasons outlined above assume that social capital and social context effects are present in the data of interest and contribute to ethnic differences in education, this may not necessarily be the case. The absence of an association between social capital and/or social context and ethnic differences in education would be a useful finding in itself.

1.8.4 Data sources

There will be two secondary data sources employed for the empirical analyses carried out in this thesis. Chapter 2 will make use of the National Pupil Dataset matched to the Pupil Level Annual

School Census. Chapters 3, 4 and 5 will make use of wave 1 data from England from the Children of Immigrants Longitudinal Survey in Four European Countries.

1.8.4.1 National Pupil Dataset and Pupil Level Annual School Census

Research into school ethnic density and poverty effects will be carried out using the National Pupil Dataset (NPD) matched to the Pupil Level Annual School Census (PLASC). The PLASC is a complete dataset of all students attending schools in England. The PLASC datasets for 2008 and 2010 will be used to create school level contextual measures of ethnic minority density and poverty composition for each school in England. Changes in school context can then be calculated using the 2008 and 2010 composition values.

The NPD used in this analysis contains academic information for the 2009-2010 cohort of approximately 500,000 Year 9 students. This dataset holds Key Stage 3 (Year 9) maths and English achievement measures, reported in National Curriculum[6] levels by school teachers. The dataset also holds Key Stage 2 (Year 6) maths and English achievement levels. Changes in maths and English levels between Key Stage 2 and Key Stage 3 represent academic progress made by students. The NPD contains school identifier codes, which allow the NPD to be matched to PLASC data. This allows school contextual effects on progress in English and maths to be determined.

[6] The National Curriculum is a framework for primary and secondary education in the UK. It outlines the subjects to be taught to students, the standards to be reached by them, and how these standards are to be assessed. The standards for each subject describe what students should learn and can be mapped on to numbered achievement targets known as "levels".

1.8.4.2 Children of Immigrants Longitudinal Study in Four European Countries

The remaining three empirical chapters will make use of new data from the Children of Immigrants Longitudinal Study in Four European Countries (CILS4EU). This is a three year cross-national quantitative study of youth in England, Germany, the Netherlands, and Sweden. The aim of the study is to understand the processes of structural, social, and cultural integration of immigrants and ethnic minorities in the chosen countries. The study and corresponding datasets are extremely rich, consisting of detailed student surveys on a wide range of topics, alongside in-class social network information, cognitive ability and language tests, and parent and teacher surveys.

This thesis will focus on wave 1 data on approximately 2,000 White British and 2,000 ethnic minority students living in England and attending one of the 107 state and independent schools selected into the stratified random national sample. Student response rates were very high (over 95%) and the quality of the information is very good.

The wide range of topics in the wave 1 student survey included:

- school and employment experiences;
- ambitions and aspirations;
- identity;
- religious beliefs and practices;
- social attitudes;
- anti-social behaviour;
- attitudes to integration, experiences of discrimination, and prejudice;

- health behaviours;
- friendships and relationships;
- families;
- social and leisure activities.

In terms of the focus of this thesis, there are a number of measures that relate to educational experiences and outcomes. The chosen educational outcome measures are university aspirations, schoolwork attitudes and behaviours, and English language proficiency (taken from the English language synonym test administered with the wave 1 questionnaire). In addition to these outcome measures, the datasets provide comprehensive information on the necessary socio-demographic controls needed for these analyses, alongside the key predictor variables used in each chapter. More details on the specific measures used in each analysis are described in the respective chapter's methods section.

1.8.5 Methods

Random-effects multilevel modelling approaches will be taken for all of the chapters because of the multilevel structure of the data. This is because whilst the outcomes of interest will be influenced by individual level factors, such as intelligence, gender, or socioeconomic status, they might also be influenced by factors at the contextual level (the classroom, cohort, or school). Students are non-randomly sorted into schools, and so clustering and intra-class correlation between individuals and schools will exist. A multilevel model allows for this clustering and so permits the investigation of factors that may operate at levels higher than the individual. Individual students are at the lowest level (level 1). Students are nested in schools (level 2) for the NPD analysis; students are nested in school cohorts (level 2) for the CILS4EU analysis. Students can only belong to, and attend, one school cohort and one school.

The models will also make use of random effects rather than fixed effects because there are a sufficiently large number of schools to make random effects modelling possible. This will allow the exploration of various school characteristics, including ethnic composition, which might be causing school effects.

1.8.6 Limitations

There are number of limitations to the research carried out in this thesis. Chapter specific limitations will be discussed in each chapter. This overview outlines issues and limitations common to all the empirical analyses presented in this thesis.

1.8.6.1 Selection bias and endogeneity

A big issue in the literature that has been acknowledged by numerous scholars is the problem of endogeneity. This is because individuals select themselves into schools, neighbourhoods, and communities in a non-random manner, which confounds the measurement of "true" effects. The measurement is confounded because the data might just capture the effects of relevant individuals (such as children's parents) and the choices they make, (such as choosing a particular school for their child) rather than actual contextual or social capital effects (Jencks and Mayer 1990; Furstenberg, Cook et al. 2007). The factors which determine the selection of individuals into associations or communities in a non-random manner are often unmeasured and often omitted from the analysis, making it difficult to understand how selection choices are made. It is also difficult to determine whether it is actually the social context or social capital of a particular group that makes people behave in a certain way, or whether the association or community simply looks as if it is causing behaviour, when in fact it is the shared characteristics of the individuals that are causing the behaviour rather than any extra social capital or social context-based contribution (Furstenberg et al. 2007). Additional problems include how best to identify

the pathways and mechanisms through which effects operate, how to measure effects, and how to determine the direction of causality (Duncan and Raudenbush 1999; Sobel 2001; Winship and Morgan 1999). These difficulties in the study of neighbourhood, contextual and social capital effects have been reasonably well addressed through the use of quasi-experimental situations, such as the Moving To Opportunity programme in the US (Katz 2001). However, these methodologies are also subject to flaws such as the problem of non-random participation again. The results are also limited in how far they can be generalised. Jencks and Mayer (1990) suggest that comparing similar children in different social situations to separate out social effects. For example, comparing similar children who come from different types of families, or who live in different types of neighbourhoods, or who attend different types of schools, or who have different religious involvement patterns would be a way to control for individual effects, thus better allowing the researcher to parse out the effect of the family, school, neighbourhood or religious community on the children's outcomes. Even when using randomised trials or propensity score matching techniques, most studies still have difficulties in definitively identifying *causal* social capital or contextual effects. This thesis acknowledges these difficulties and tries to model selection where possible, but emphasises that causal interpretations must be made cautiously due to the endogeneity problem.

An additional endogeneity problem arises through the use of cross-sectional data. Unfortunately, for the most part, the modelling in this thesis uses cross-sectional CILS4EU data. This makes it difficult to identify causal associations because of the cotemporaneous nature of the independent and dependent variables, leading to Manski's fundamental reflection problem (1993). To summarise briefly, the reflection problem arises in situations where it is not possible to distinguish the effects of the *average characteristics* of the group from the effects of the *average*

behaviours of the group because these are correlated. Schmutte (2010) gives the example of a model where the amount of study done by an individual student is determined by some individual characteristics (such as parental income), some group characteristics (such as average parental income of the students in the class), and some group behaviours (such as the average amount of study done by students in the class). Schmutte notes that if average study of peers is high when average parental income of peers is high (the two are positively correlated), then it is difficult to disentangle the two separate effects in the model with cross-sectional data. This problem always exists in the absence of reliable longitudinal data, and so again, causal interpretations must be made cautiously. This thesis attempts to use non-causal terminology, such as "associations" or "links", but the term "effects" is almost unavoidable. The reader is urged to interpret the term "effects" in a cautious manner as it is always used to refer to statistical associations rather than proven causal effects.

1.8.6.2 Self-report measures and student non-response

Aside from the NPD/PLASC data, where schools provide the bulk of the measures (with parents providing some information), the other data used in thesis may potentially suffer from bias due to student self-reporting. There is the risk that students may want to conform to what they believe is the "correct" or "appropriate" response to survey items, meaning that survey responses may not be accurate reflections of the student's "real" or "true" attitudes and experiences. In the same way students may have been reluctant to reveal "true" answers in the presence of teachers or fellow students[7]. A similarly serious risk arises purely because students may not actually know

[7] The survey was administered within schools, but carried out by external research agency fieldworkers rather than teachers or school staff members.

the correct answer for factual questions. This may lead to incorrect responses through a lack of knowledge, and so will especially apply to cases where students are answering about other people, such as their parents. Questions on parents' job titles and job descriptions, parents' countries of birth, and parents' highest completed education may have been incorrectly answered by students. The parental survey in England suffered from low response rates (approximately 25%) meaning that the bulk of information about parents comes from the students themselves. Therefore there are some potential issues in the validity of some of the demographic and social information of parents. However, it is assumed that some information is better than no information, and so this data is relied upon and assumed to be valid (answers that were obviously invalid or implausible were removed from the data in the cleaning process). Further, bias is not necessarily a major issue if it is constant across cases, as then estimated relationships between variables will be affected to the same extent across cases.

An additional problem is that students may not have taken the survey seriously or did not put sufficient effort into the survey, leading to poorer quality measures than could have been achieved. For the most part, it is not possible to determine whether non-response to specific survey items was due to time constraints, comprehension difficulties, or reluctance on the part of some individuals to answer those questions. As such, for questionnaire items where 100% response was not achieved, there is some concern as to why there was not complete response. For simplicity's sake, the reasons behind non-response are not investigated in this thesis, but the issue is highlighted nonetheless.

In terms of the NPD analysis, teacher reports of student achievement were used, which could be subject to bias as standardised tests administered by external examination agencies were not used. It is expected that any systematic bias would be at the school level. Since students change

schools between year 6 (when students are in primary school) and year 9 (when students are in secondary school), it is hoped that the risks of this bias are reduced.

1.8.6.3 Ethnic categorisation

As defined in the note on ethnicity in this introductory chapter, ethnicity is a fluid concept to which multiple characteristics, factors, and dimensions contribute. The relative flexibility of what defines ethnicity is both a strength and a weakness. The big problem with regards to this thesis is the reliability and accuracy of the ethnic categorisation process applied to the datasets. It could certainly be the case that the ethnicity of an individual is interpreted in different ways by different others, meaning that the same individual ends up in different ethnic groups because of the categorisation process of each of the others who determine the individual's ethnic category. In the same way, the individual themselves may identify subjectively with a certain ethnic group, but others may classify that individual into a different ethnic group. Ethnic identification may also vary across contexts, with individuals self-defining in different ways according to the social situation. This "swapping" of ethnic identities is well noted in the literature (for a review see Phinney 1990) and may be especially relevant to individuals of mixed heritage. Therefore, there are clear difficulties in defining ethnic groups and then classifying individuals into these groups.

The NPD/PLASC dataset uses parental responses about the ethnicity of their child. Parents are offered the standard UK Census categories and so must make their choice from a pre-defined list. It is possible that the same student changes ethnic categorisation over the course of their school career, primarily because of changes in the classification schema over time, but perhaps also because parents change their minds about their child's ethnicity. It is expected that the overwhelming majority of individuals maintain the same ethnic grouping over their school career, but the potential for changes must be noted nonetheless.

The case is more complicated in the CILS4EU dataset. The wave 1 survey did not include a Census style ethnicity question, and so ethnicity is determined using a combination of country of birth, parent's/parents' country/countries of birth, and subjective ethnic belonging and identification chosen from a list of common ethnic groups in the UK (with an option to fill in an open answer box with a non-listed option, or respond to belonging to no ethnic group). Such a classification procedure is fairly common in most European surveys, due to most national Censuses not asking about ethnicity in the same way that it is asked in the UK and US Censuses. One advantage of such a classification is that generational status can be identified (using indicators of grandparents' places of birth) in addition to ethnic grouping.

However, there are, of course, problems with such a procedure. This biggest problem is the potential for the same individual to be classified in different ways according to which sets of rules are used to determine the classification process. A second problem exists with regards to determining the ethnic groupings themselves. In order to maintain consistency with much of the UK literature on ethnic inequalities in education, this thesis attempts to utilise an ethnic classification similar to the Census classification, although there are some differences according to sample sizes. The Census measure was introduced to the survey in wave 2, and so an interesting future project could be to look at the degree of overlap in the placement of individuals between the categorisation procedure used here, the Census classification, and the subjective ethnic belonging measure.

1.9 Overview of empirical chapters

Four empirical chapters will follow this introductory chapter. The contents of these chapters is summarised below. The thesis will end with a concluding chapter.

1.9.1 Chapter 2 – School composition and academic progress

The first empirical chapter looks at the broad social context of the school. The research explores how changes over time in the ethnic minority and poverty compositions of the secondary school are associated with differential academic progress outcomes for students from different ethnic backgrounds. Given that there are ethnic differences in educational outcomes, the aim of this chapter is to understand if the effects are intensified or neutralised by varying school social contexts.

The motivation for this chapter comes from the wealth of research on neighbourhood and school-based contextual effects from the US, Europe, and the UK. The findings on ethnic composition are mixed, however, with researchers reporting positive, negative, and neutral effects of ethnic density and diversity. Felouzis (2003) finds negative effects of high immigrant density in schools on the grades of immigrant students in France, whilst Fleischmann and colleagues (2011) find positive effects of high neighbourhood ethnic density on the school completion rates of second generation students. In a Norwegian study, Fekjaer and Birkelund (2007) find no effects of school ethnic composition on student grades and school careers. The evidence so far is mixed, but effects have been found by some authors, and so further study on this topic is clearly needed.

It is important to note the range of educational outcomes and compositional measures used in the field of ethnic contextual effects alone. Aside from ethnic composition effects, an early study by Coleman and colleagues (1966) found significant effects of average school attainment on individual results, whilst Hamnett and colleagues (2007) argue that students tend to do better when their peers are from socially advantaged backgrounds, regardless of the individual's own social background. There is evidence, then, for school based contextual effects beyond those related to ethnic composition alone.

This research chapter will make use of the National Pupil Database (NPD) and the Pupil Level Annual School Census (PLASC). Students are tracked through their schools careers in the NPD, whilst the PLASC is an annual register of all students in schools. Two years of the PLASC dataset (2008 and 2010) will be combined to create changes in school composition measures for every state secondary school in England. The NPD holds academic records for every pupil in England. Of interest to this chapter are the NPD records for the school cohort of those students in school year 9 (aged 13/14) in summer 2010. The research will focus on the academic achievement records in maths and English for students when they were at the end of Key Stage 2 (aged 11/Year 6) and when they were are the end of Key Stage 3 (aged 14/Year 9). Progress in maths and English will be calculated by the change in absolute achievement between Key Stage 2 and Key Stage 3. Then the change in school composition variables will be matched to the NPD progress dataset for this cohort to allow statistical associations between social context, ethnicity, and progress to be made.

Results suggest that there are school social context effects for students across all ethnic groups. In particular, there are positive associations between increases in school ethnic minority density and increased academic progress for students of most ethnic groups. Larger negative effects, however, arise from increases in the school poverty context. Universally, students do better in schools where the proportion of poor students is lower and where average levels of poverty decrease rather than increase.

1.9.2 Chapter 3 – Religiosity and aspirations

Following on from the school contextual effects identified in chapter 2, chapter 3 narrows the social context from the whole school level down to the school cohort (or year group) level. In particular, this chapter looks more closely at the contribution of individual and school cohort

level religiosity (religious attitudes and behaviours) on ethnic differences in university aspirations. This chapter is based on the individual level theory that increases in religiosity provide educational advantages through increased internal locus of control, avoidance of educationally harmful behaviour, and improved work ethic (Jeynes 2003a). In addition, theories of social capital are relevant here in terms of religiosity potentially providing greater access to ethnic/religious social networks and community resources, which in turn may improve educational outcomes amongst ethnic minority youth (Zhou and Bankston 2002).

The finding that some children of immigrants outperform "native" children has been consistently reported in both American and British studies (e.g. Rothon 2005; Zhou and Bankston 1998; Zhou and Bankston 2002; Rumbaut and Portes 2001). Some researchers propose that religious participation is what explains this outperformance. It is argued that religious behaviours and institutions can instil positive educational norms and provide social capital by being a source of community focus through which members of an ethnic community can come together, share resources and promote certain behaviours (e.g. Min 1992; Haddad and Lummis 1987; Hurh and Kim 1990; Bankston and Zhou 2000; Muller and Ellison 2001).

There is some empirical evidence that religious participation contributes positively to academic outcomes. For example, Sanders (1998) found that church involvement, alongside parental support, positively affected African American children's achievement. Similarly, Regnerus (2000) found positive effects of church involvement and religious beliefs on both test scores and educational expectations for American urban high school sophomores. Byfield's (2008) study of Black male university students in the UK and the US also finds positive effects of religious and church community involvement on academic achievement. Alongside Black children, similar

explanations have been posited for the children of some Asian immigrants e.g. Vietnamese and Chinese students (Zhou and Bankston 2002).

This research chapter will attempt to test religious-based social explanations for ethnic differences in university aspirations as ethnic differences in religiosity are relatively under-explored and potentially could provide more explanatory power for ethnic differences in education than have been currently harnessed.

This chapter will be the first of three making use of wave 1 data from the England from the Children of Immigrants Longitudinal Study in Four European Countries (CILS4EU). This survey asked over 4,000 ethnic majority and ethnic minority students about their religious affiliation, religious attitudes, and religious behaviours. Students were also asked about their future educational aspirations, and information on the type of school students attended was recorded. The availability of data on ethnic minority students and White British students allows differences in religiosity between ethnic groups to be compared to the majority population and with each other. Further, cohort level measures of religiosity and other compositional measures can be investigated using this data to understand how the social context of the school cohort affects individual outcomes.

To briefly summarise the results, it seems that there are significant ethnic differences in the likelihood of aspiring to university, which are not explained by religious affiliation or attendance at a religiously affiliated school. Individual level religiosity is positively associated with university aspirations, suggesting that perhaps the access to religious social capital/resources available to the more religious student does contribute positively to educational outcomes. Cohort level religiosity was not significantly associated with university aspirations.

1.9.3 Chapter 4 – Parenting and schoolwork attitudes and behaviours

The findings in chapter 3 suggested that individual religiosity is positively associated with university aspirations, whilst school cohort religiosity is not significantly associated with university aspirations. Chapter 4 changes the relevant social context again by taking a closer look at how family social capital, in the form of parent-child relationships, influences ethnic differences in educational outcomes. Specifically, this empirical chapter uses CILS4EU data to test Coleman's (1988) theory of intergenerational social closure to see if parental closure is associated with a increase in positive schoolwork attitudes (importance of school grades) and schoolwork behaviours (effort put into school work) for children. A number of authors have found that students who have a value-based motivation for their academic work will experience greater and better cognition and improved effort, which contribute to better educational outcomes (e.g. Ames and Archer 1988; Dweck and Elliott 1983; Eccles 1983; Meece, Blumenfeld et al. 1988). Academic motivation has been found to have a positive impact on school performance, with perceived academic competence and perceived academic self-determination influencing academic motivation (Fortier, Vallerand et al. 1995). Therefore it is plausible that ethnic differences in schoolwork attitudes and behaviours (and academic motivations) contribute to differences in educational achievement and attainment.

The theory of intergenerational social closure hypothesises that children will be more successful if their parents know the parents' of their friends i.e. the parent A – child A – friend B – parent B network loop is closed. This is expected to improve children's school outcomes because such a closed network features norms, obligations, and expectations which are consistent across social environments and which are reinforced by the adults in contact with the children. In his later work, Coleman (1987) suggested that norms for academic success, and thus levels of parental

involvement, may vary across ethnic groups. As such, it is plausible that levels of intergenerational social closure vary across ethnic groups and contribute to ethnic differences in education. The literature is lacking in work on the effect of intergenerational social closure on schoolwork attitudes and behaviours and on variations in parental closure across ethnic groups. Further, there is a gap in the literature in terms of considering intergenerational social closure as both an individual factor and a contextual factor. This research chapter addresses this gap by indeed testing parental closure at both levels.

This empirical chapter also uses wave 1 data from the English portion of the Children of Immigrants Longitudinal Study in Four European Countries (CILS4EU). The relevant survey items for this chapter are students' self-reports on the importance of school grades to them and their degree of agreement to a statement concerning high effort put into schoolwork. In addition, an item asking students how much they agreed with the statement "my parents want to know the parents of the friends I hang out with" is converted into a dichotomous variable ("strongly agree" vs. rest) to indicate the presence or absence of parental closure. The proportion of students reporting parental closure in the cohort is used as the contextual level measure of closure. Variations in the effects of parental closure across ethnic groups are also explored alongside main effects of closure at the individual and contextual level.

Results suggest that parental closure at the individual level is positively associated with the importance of school grades, and that this effect is robust to the inclusion of a range of other parental encouragement and involvement variables. The cohort level main effect of parental closure on the importance of school grades is, however, not robust to the inclusion of contextual measures of the proportion of ethnic minority students in the cohort, and the proportion of students with a degree-educated parent in the cohort. There are, however, significant cohort level

parental closure effects for two ethnic minority groups (the African group and the Caribbean group), suggesting that students from these groups who belong to school cohorts with relatively closed parental social networks gain academic advantages even if they themselves do not have parents who pursue intergenerational social closure. Therefore, it seems that the parental network aspect of the school community may also contribute to educational outcomes for these two ethnic groups.

However, the same effects do not exist for the effort put into schoolwork outcome i.e. there are no robust individual or contextual effects of parental closure on the effort put into schoolwork. Further, there are no significant interaction effects between ethnic group and cohort level parental closure for the effort outcome. This indicates that parental closure may be more relevant in terms of transmitting values and attitudes, but less relevant with regards to influencing behaviour. In general, as there are almost no significant interactions between cohort level parental closure and ethnic group for both outcomes, it appears that effects of cohort level parental closure are mostly the same across groups.

1.9.4 Chapter 5 – Duration of residence and language proficiency

This final empirical chapter is based on the well-established hypothesis that ethnic differences in education stem from differences in English (L2) language skills. Proficiency in English is fundamental to the achievement of success in the British school system, whilst there is debate over whether proficiency in an additional language provides an educational advantage. Language proficiency can be considered a key educational outcome for students in its own right, independent of the association between language proficiency and academic success. As such, language proficiency can be taken to be a key mechanism through which ethnic differences in education result. It is posited that the age of arrival of immigrant individuals and the use of an

ethnic (L1) language influence English language proficiency, so that students who arrive in England at earlier ages and who do not use an alternative language will be more proficient in English. As this chapter uses CILS4EU data, the age of the sampled students is more or less the same (14 or 15 years of age when surveyed) and students are all from the same school year group (school cohort). This means that age of arrival can be subtracted from the student's age at survey in order to calculate an estimate of the duration of residence in England[8]. In other datasets where both the current ages of the sampled individuals and their ages of arrival vary, both duration of residence and age of arrival would need to be included in the model to control for cognitive development pathways in childhood. In this dataset, duration of residence is sufficient as it captures the opportunity for exposure to the English social context.

The authors of the literature in the field of language and education seem in agreement in their findings that students who are not proficient in English are at a higher risk of falling behind or underperforming in school compared to their language proficient peers (e.g. Golash-Boza 2005; Portes and Schauffler 1994; Rumberger and Larson 1998). Thinking of the UK context, Modood (2003) suggests that Asian children typically come from homes where English is not spoken and so are often behind their White British and Caribbean peers when they begin school. As Asian children develop their skills in L2, they catch up, and then even overtake, their non-Asian peers. Modood's discussion of the in-school development of Asian students' English language skills suggests that language is potentially fostered through peer interactions and peer effects. As such, it is possible that there are school social context effects (e.g. average language proficiency of the

[8] Unfortunately, the dataset does not contain information on any substantial post-migration period(s) of time spent outside of the UK by the student – only their date of birth and their age of arrival into the UK.

year group) on the development of English language skills amongst non-English speakers. Further, Modood's arguments include both the effects of children using languages other than English in the home, and of having their exposure to English delayed, on their English proficiency when starting school. Both of these effects will be investigated in this chapter.

CILS4EU data on the student's age at survey[9], age of migration, and English language test scores are used in this chapter. The school social context in terms of average duration of exposure to English society and proportion of students who have an additional language are tested in the analysis to see whether language context has an effect in addition to individual level duration of residence and L1 use effects.

Results are mostly as expected for this chapter's analysis: the longer students have lived in England, the higher they score on the English language test. In addition, belonging to a school cohort with a higher average duration of residence (in other words, fewer first generation immigrants who arrived at older ages) is positively associated with English proficiency. Such findings seem to suggest the existence of language-based peer effects in that students' language proficiencies may influence the English skills of their classmates. This indicates that ethnic differences in education that stem from problems with English language proficiency may well have a social component to their explanation if students are segregated between and within schools according to age of arrival or generation status.

Ethnic differences in English proficiency seem to be almost completely explained by differences in the duration of residence in England. In contrast to the findings for duration of residence, the

[9] Age at survey is calculated from the student's month and year of birth subtracted from the date of survey administration.

effects of having an additional language are neither significant at the individual level nor at the cohort level. Thus duration of residence seems more relevant here rather than additional language use.

1.10 Summary

The objective of this thesis is to understand ethnic differences in educational outcomes using individual and social explanations. Traditional explanations have looked at structural and cultural differences between ethnic groups. This thesis considers the problem using a third approach based around the relevance of the social context in which students live their daily lives. The approach is based on the assumption that individual educational outcomes are influenced by more than the student alone. A whole host of relevant others, from the family, to the classmate, to the year group, to the school, to the religious and ethnic community may impact on the student's educational outcomes. These relevant others interact with the student in various social contexts, and so the characteristics and dimensions of these social contexts may be highly relevant and influential. The study intends to investigate these social contexts, to show patterns of ethnic differences across a range of educational outcomes, and to apply quantitative data analysis techniques to large-scale datasets in order to explain these ethnic differences using individual and social explanations. Chapter 2 follows, in which the ethnic minority and poverty compositions of schools are investigated as an explanation for ethnic differences in academic progress.

Chapter 2: Associations between school social context and academic progress

2.1 Introduction

Much of the existing literature on ethnic minority educational outcomes in the UK suggests that there are significant disparities in attainment and progress across ethnic minority groups, and between ethnic minority groups and the majority White British population (e.g. Heath and Brinbaum 2007; Heath et al. 2008; Lessard-Phillips 2009; Rothon 2005; Plewis 2009). One explanation for ethnic differences in education is the variation in school social context experienced by students of different ethnicities. Some researchers have persistently found that the characteristics of the student population have more of an impact on achievement than do aspects of the schooling experience such as school policies, teaching practices, facilities, and resources (Selden 1990; Caldas 1993; Neisser 1986). In the UK, schools vary greatly in terms of the characteristics of the student population. Some students attend schools with high proportions of ethnic minority students, whilst other students attend schools where almost all students are of White British ethnicity. Similarly, the socioeconomic characteristics of the student population vary greatly across schools. The average poverty level of the student population varies across schools and may also be correlated with its ethnic composition. This variation in student composition may create very different school social environments for both ethnic minority and White British students, and may lead to very different performances by students in these schools.

The evidence on contextual effects in school, particularly ethnic and poverty-based contextual effects, is mixed. The theory suggests that higher concentrations of students from more

disadvantaged background result in lower levels of academic success[10] (Elliott et al. 2006). This theory will be empirically tested, with students of disadvantaged backgrounds conceptualised as those with a higher poverty status or from an ethnic minority background[11]. This study will contribute to the field by using contemporary data from the large-scale dataset, the National Pupil Database (Department for Education 2009; Department for Education 2007), to analyse two key types of contextual effect - ethnic minority density[12] and poverty density[13]. This study will explore how changes in ethnic minority and poverty composition between school year 7 (the first year of secondary school) and school year 9 (the third year of secondary school) are associated with the academic progress made by students in maths and English between their end of Key Stage 2 (KS2) assessments (when students are at the end of school year 6, at around age 11) and their end of Key Stage 3 (KS3) assessments (when students are at the end of school year 9, at around age 14).

Academic progress, rather than academic attainment, is the focus of this study. Attainment refers to the academic level achieved in absolute terms at the time of assessment. Progress refers to the improvement (or decline) in academic attainment between two or more time points. In this research only academic progress will be considered as an outcome variable in order to better

[10] Elliott and colleagues suggest that higher concentrations of disadvantaged students lower educational outcomes through fewer opportunities for learning, less information about education and the education system, lower educational aspirations, and a lack of role models.

[11] It is acknowledged here that White British students are by no means immune from disadvantage. However, the research suggests that only the Indian and Chinese groups consistently out-perform the White British group – the remaining ethnic groups all experience some degree of educational disadvantage compared to White British students who are not in poverty. White British students in poverty are educationally disadvantaged compared to very poor non-White British students.

[12] Ethnic minority density is a measure of the proportion of individuals in the school who are not White British. It can range from 0 (all individuals are white British) to 1 (all individuals are ethnic minorities).

[13] Poverty density is a measure of the poverty level of the school. It is an average of the individual level poverty measures (IDACI scores) of the students attending the school.

identify any school-contextual effects. Academic attainment at KS3 is strongly influenced by academic attainment at earlier school stages, where many other factors may have had effects that cannot be adequately accounted for using the data for this chapter. Crucially, academic attainment at KS3 may have been affected by KS2 (primary) school contextual effects. In order to avoid confusing primary school and secondary school contextual (and other) effects, the safer and more reliable outcome variable to consider is academic progress between stages, with prior KS2 academic attainment controlled for to account for the effects of earlier schooling. By focusing on progress in this way, the effects of secondary school social context can be better isolated and captured. School ethnic minority and poverty composition are hypothesised to be key characteristics of the school social context and thus potential contributors to the ethnic educational gap.

2.2 Theory

Basic economic theory posits that decisions are based purely on circumstances at the individual level. In contrast, theories of neighbourhood effects propose that the social context and interdependency of actors and their social interactions may also influence the decision making process (Akerlof 1997). Contextual effects are a type of neighbourhood or social effect where the outcomes of an individual are in some way influenced by the aggregated or contextual characteristics of those around him or her. According to Blalock "[c]ontextual effects models represent an effort to explain individual-level dependent variables using combinations of individual- and group-level independent variables" (1984: 353).

In terms of schools-based research, contextual effects can arise when the social composition of the school (such as the ethnic, poverty, or ability composition of the student body) influences individual students' orientations and actions. This influence is a result of the interactions

between different sorts of students, which may result in an effect on individual students' norms, attitudes and values (Jencks and Mayer 1990). These influences may be positive, negative, or neutral.

This thesis tests two types of proposed social contextual effects (ethnic minority density and poverty density) within the school setting to see if they are associated with the academic progress made by a sample of teenagers attending secondary schools in England. It is expected that each of these school level contextual effects will be associated with individual level academic progress.

In order to reduce the problem of non-random allocation[14] of students to schools, this study investigates *changes* in school ethnic minority density and school poverty density *within* the secondary schooling stage of individual students. By focusing on the change in school ethnic minority density and school poverty density from when students entered the secondary school in year 7 to when they receive their KS3 assessments in year 9, one can be more confident that "true" contextual effects are identified. This is because individual student preferences for school composition are accounted for by controls for school ethnic minority density and poverty density at the time of entry to secondary school (year 7), so that if one assumes consistent preferences for school types within individuals across their schooling years, then any changes in composition

[14] The non-random selection by students (or their parents) into schools may lead to endogeneity bias in the analysis if students non-randomly select into schools according to the composition of the school and their own academic ability. For example, if higher ability students are more likely to select schools with lower ethnic minority density, but this non-random selection is not acknowledged, then one may mistakenly assume that higher ethnic density schools have lower academic outcomes *because* of the ethnic minority density of the school, when in fact this association might be spurious and a product of the different school composition preferences of different sorts of students.

between school years can be assumed to be random (i.e. not influenced by individual preference) and so are "true" contextual effects of composition.

More detailed hypotheses will be outlined later in this chapter, but first it is necessary to outline the research already carried out in this field.

2.3 Previous research

Over the last decade school contextual effect studies have become increasingly prevalent, with research taking place in multiple countries and with mixed results. This literature review will begin by looking at the most relevant and most recent work from the UK, before discussing the more general European and American literature in the field.

2.3.1 Evidence from the UK

The first, and most relevant, study reviewed here is that of Plewis (2009). Plewis used multilevel modelling techniques to understand how differences in Key Stage 2 attainment (at age 11) are associated with school ethnic composition. Plewis noted that schools with higher proportions of ethnic minority students (higher ethnic minority density schools) tended to also be schools with higher proportions of poorer students (higher poverty density schools) and in more disadvantaged neighbourhoods. He found that ethnic composition was negatively associated with attainment at Key Stage 2. This finding motivates this chapter's first hypothesis.

H1: Increases in school ethnic minority density between school year 7 and school year 9 will be associated with lower progress in a) maths and b) English for all ethnic groups.

There is, however, a vast amount of research from the UK suggesting that students from many ethnic minority groups actually out-perform White British students (e.g. Drew and Gray 1990;

Nuttall, Thomas et al. 1992; ILEA Research and Statistics 1987; cited in Modood 1993). Therefore, it is plausible that schools with greater proportions of ethnic minority students may be associated with higher progress for students of all backgrounds, leading to an alternative hypothesis.

H2: Increases in school ethnic minority density between school year 7 and school year 9 will be associated with higher progress in a) maths and b) English for all ethnic groups.

Returning to Plewis' paper, the author posited that the non-random selection of different sorts of students into different sorts of schools, alongside between-school variation in school policies, contributes to differences in student performance along ethnicity and sex lines. His argument is that school selection and school policy effects may vary according to the ethnic composition of the school, and so could be mechanisms for ethnicity-based school contextual effects. There is no empirical evidence for this however, and unfortunately school policy and school selection mechanisms cannot be tested in this chapter because the data is unavailable. Nevertheless, Plewis' work inspires the research questions on educational progress between two school stages. Plewis focuses on absolute attainment at age 11, which potentially confounds the unmeasured effects of earlier schooling and earlier school social context with the situation at age 11. This thesis chapter attempts to improve on Plewis' work by looking only at progress between school stages and controlling for prior attainment, thereby incorporating measures of earlier schooling into the analysis.

Plewis' work further motivates the research question on how effects vary across subjects, and across more specific ethnic groups including the Mixed ethnicity group. His speculation that non-random selection of students into schools of different ethnic composition may contribute to

ethnic differences in education can be better tested in this chapter than in his own study because of the use of data from two school stages. Therefore this thesis chapter looks at the progress in two different academic subjects of a broad range of ethnic groups, and investigates how change in school social context contributes to ethnic differences in progress.

In an earlier paper, Hamnett, Ramsden and Butler (2007) also used the Pupil Level Annual School Census (PLASC) and National Pupil Database (NPD) to focus on students' GCSE outcomes. The authors' findings suggested a positive and significant correlation between higher proportions of Asian Other students on school GCSE performance, and also a positive but non-significant correlation between the proportion of Indian students and school GCSE performance. The proportion of students from all other ethnic groups, apart from the White and Chinese groups, was found to be negatively associated with school GCSE performance, but these correlations are not significant. More important than school ethnic density is the proportion of students from advantaged social backgrounds. Students from all social and ethnic backgrounds seemed to have higher achievement when they attend schools with higher proportions of students from higher social class backgrounds.

H3: Increases in school poverty density between school year 7 and school year 9 will be associated with lower progress in a) maths and b) English for all ethnic groups.

Both British pieces of research cited here, alongside a number of other empirical studies (e.g. Hanushek, Kain et al. 2002; Robertson and Symons 2003; Willms and Somer 2001), argue that the socio-economic composition of schools is an important factor in explaining educational outcomes. It seems important, and necessary, to consider the school's social background composition alongside its ethnic composition. The omission of an important contextual measure

such as school level socio-economic background would potentially confound any results found for ethnicity-based contextual effects. However, a drawback of the NPD/PLASC dataset is the absence of a good measure of social background, social class, or socioeconomic status. The closest available measures are those on poverty rather than social class. It is widely accepted and acknowledged that poverty and social class are not interchangeable measures as they capture very different aspects of an individual's situation. But in the absence of a decent social class measure, this study instead will consider effects of school poverty composition. Individual level poverty measures will also be taken into account in the analysis to test whether there are any contextual effects of poverty on educational outcomes above and beyond effects of individual level poverty.

There is an abundance of literature on neighbourhood and contextual effects from Europe and the US. Therefore the following section will attempt to synthesise this work so as to provide a summary of the key findings and important considerations for the research to be presented in this chapter.

2.3.2 Evidence from the US

The most well-known of US contextual effects studies is *The Coleman Report* (Coleman et al. 1966). This pioneering study argued that ethnically integrated schools raised the attainment of ethnic minority students. Further, the report was one of the first to identify the negative effects of concentrations of students with low socioeconomic status. When discussing the factors that affected achievement Coleman suggested "[school] facilities and curriculum least, teacher quality next, and backgrounds of fellow students most" (Coleman 1968: 18). This is a strong, and early, argument for the influence of school social context on educational outcomes. Although the methodology of the Coleman report was subsequently criticised by Jencks (1972) it nevertheless

raised the profile of the study of school contextual effects and ethnic minority outcomes. Two more recent US studies support Coleman and colleagues' findings by also emphasising the negative associations between concentrations of economically disadvantaged students and educational outcomes (Caldas and Bankston 1997; Rumberger and Palardy 2005).

In more recent years, the work on school contextual effects in the US has been driven by Bankston and Caldas. Over the past twenty years, these authors have investigated effects of ethnic minority concentration, poverty concentration, and concentrations of students from single-parent households on the educational outcomes of American students. Their work is detailed and extensive, but can be summarised in the findings of three papers that are of particular interest and relevance to this thesis chapter. Firstly, in their 1996 paper, the authors found that ethnic minority concentration is strongly negatively associated with achievement test results, and that this association is not explained by socioeconomic factors. Further, they note that the negative effect of ethnic minority concentration applies to both White American and African American students (Bankston and Caldas 1996). A similar study carried out one year later reconfirmed the finding that after controlling for relevant student and school factors, the percentage of ethnic minority students negatively affects student achievement (Caldas and Bankston 1997).

More recently, Bankston and Caldas (2000) argued that negative correlation between the concentration of ethnic minority students in a school and achievement test scores may be driven by the family structure of the school students. They note that schools with high ethnic minority densities also tend to be schools with high proportions of students from single-parent families, and so suggest that it is not socioeconomic factors driving the negative correlation but weaker family structures. Family structure will not be explored in this chapter due to data limitations, but remains a possible explanation for the negative relationship between poverty density and

academic progress found in this chapter and so will be touched on again in the concluding section.

2.3.3 Evidence from Europe

European findings appear to be similarly varied and mixed in terms of how school ethnic context is associated with academic advantage or disadvantage. For example, Norwegian results suggested that the effect of school ethnic composition on student grades and school careers is neutral (Fekjaer and Birkelund 2007) whilst a study of the Bordeaux region in France found high levels of ethnic segregation and a negative effect of high immigrant school composition on the grades of immigrant students (Felouzis 2003). A recent study using Belgian Census data to examine the joint effects of neighbourhood structure and ethnic density found positive effects of neighbourhood ethnic density on the school completion rates of second generation students, after controlling for neighbourhood stability and quality (Fleischmann et al. 2011). These three studies alone demonstrate positive, negative, and neutral effects of ethnic context on outcomes, and so indicate the necessity of further study of ethnic contextual effects and educational outcomes.

Many of the studies carried out in Europe find negative associations between immigrant concentration or ethnic minority concentration and educational outcomes (e.g Felouzis 2003; Cebolla Boado 2007; Dumay and Dupriez 2008). However, many European studies equally find no associations between immigrant/ethnic minority concentration and educational outcomes once relevant individual level controls or school socioeconomic composition are taken into account (e.g. Fekjaer and Birkelund 2007; Cebolla Boado and Garrido Medina 2011). The research from European suggests that school ethnic composition and school socioeconomic composition are deeply inter-connected, but that socioeconomic composition is potentially a more powerful contextual influence on educational performance. The increasing understanding of the relevance

of school socioeconomic composition is well demonstrated in a relatively early study (in terms of European work) from the Netherlands. In his earlier paper, Driessen (2002) found strong negative effects of school socio-ethnic composition (measured by school average level of parental education and student's ethnicity) on the language performance of grade 4 students. Weaker effects were found for the language performance of grade 8 students and the maths performance of grade 4 students; no effects were found for the maths performance of grade 8 students. In this paper, Driessen suggested that school concentrations (50% or more) of ethnic minority students with lower educated parents lead to the lower educational performance of students, net of controls for sex, intelligence, age, ethnicity and parental education. As such, he argued that "ethnic minority pupils are better off in schools with a large percentage [of] non-minority pupils" (Driessen 2002: 326). However, later work by the same author with colleagues simultaneously considered ethnic minority density and socio-economic composition (percentage of employed mothers and variation in fathers' income) of the student body, and then found that there were no significant effects of ethnic minority density (Van der Slik, Driessen et al. 2006). It seems the first work suffered from omitted variable bias (Dietz 2002), resulting in a spurious negative correlation between ethnic minority concentration and academic performance. This body of research motivates the simultaneous investigation of ethnic minority density and poverty density, and further encourages the exploration of interaction effects between individual ethnicity and school contextual effects.

The approach of simultaneously considering the effects of neighbourhood and school characteristics on educational outcomes was expanded by Brännström (2008) in his study on metropolitan Swedish school students. Brännström found that school characteristics contribute more to variability in academic achievement than neighbourhoods do, and that there are

contextual effects of the characteristics of both neighbours and school peers even after controlling for individual level background characteristics. Due to data limitations, it is not possible for neighbourhoods to be considered at the same time as school ethnic composition in this chapter. However Brännström found that school characteristics are more important than neighbourhood characteristics so the lack of data on the latter is not of too great a concern here.

To briefly summarise some of the other well-cited papers in this field, Cebolla Boado's (2007) research on lower secondary schools in France found that negative contextual effects on school attainment exist when the immigrant concentration is considered to be a random process, but that once the distribution of immigrants is considered to be non-random, there is no significant effect of immigrant concentration on individual school attainment. Szulkin and Jonsson (2007) used Swedish register data to determine whether the ethnic density in comprehensive primary (up to age 16) schools affected teacher-assigned school grades. This study distinguished between first and second generation ethnic minority students and found that the proportion of first generation immigrants in a school depressed teacher-assigned school grades in general, but especially for the first generation immigrant students themselves. The proportion of second generation students did not have a similar effect. Unfortunately, there is no information on generational status in the data used for this chapter, so ethnicity will be looked at more broadly without specific generational constraints. This will allow a greater sample size to be included in the analysis, although some detail will be lost through the omission of generational status.

In one final very recent paper, Agirdag and colleagues' findings for Belgium were common to those in many other European compositional effects papers in that increased proportions of ethnic minority and lower SES students were associated with lower educational outcomes for both majority and minority students (Agirdag, Van Houtte et al. 2012). However, the authors

argue that once relevant individual-level controls are included in the model the ethnic composition effect disappears, and further that any remaining effects socioeconomic composition disappear once individual-level sense of futility and school-level culture of futility are considered.

The literature review shows that whilst research in this field is increasing, the results are still mixed and contradictory. It seems that there may be differences across countries and also differences according to the ethnic groups involved and their generational status. Further, there are differences in results according to the educational outcome under consideration and the age and gender of the children being studied. There are many ways in which to measure the ethnic context of a school and these in turn seem to change results. Finally, even if researchers find a correlation between school composition and students' outcomes, this is not the same as evidence of a causal relationship. The problem of non-random selection into schools means that the correlation could just represent a selection effect of parents' choices about investments in education (Johnston, Wilson et al. 2006).

2.4 Contribution to the field

The research presented in this chapter contributes to the field by aiming to provide a better understanding of ethnic and poverty contextual effects in secondary schools. In particular, the chapter considers a more detailed ethnic group classification than has been traditionally considered. Furthermore, the sample size is maximised by using data from students across England, rather than from within a lower level geographic region, which makes the results nationally representative and allows them to be generalised across schools in England.

Plewis (2009) stressed the importance of analysing subjects separately rather than assuming similar trends across different subjects, and so this study makes an attempt to do that by considering two core academic subjects – maths and English. The research questions are addressed in a dynamic way by looking at progress between KS2 and KS3. The difference in progress at different school stages seems especially evidence amongst ethnic groups, perhaps because of a delay in English acquisition, and so this study tries to untangle some of the different processes at work by considering academic progress.

This study also attempts to shed some light on a stage of schooling that has not been well researched, and which could plausibly have major influence on later school outcomes and decisions. Past research has focused on the performance of British students at the end of primary school (KS2) or at the end of secondary school (KS4 – GCSEs). Therefore the focus of this chapter on outcomes at the middle-stage of the school career (KS3) contributes to the field as contextual effects for this age group have not yet been studied.

The simultaneous consideration of both ethnic and poverty contextual effects using data from England is also a step forward in the field. Finally, this chapter makes use of data on the change in school context over school years to better identify contextual effects, to address the issue of causal ordering of effects, and to reduce the problem of non-random selection of students into schools. The methodological issues are expanded upon in the next section.

2.5 Methodological issues

There are many methodological issues in contextual effects work - not least the correct identification of contextual effects in the first place. Correlations between social context and individual student outcomes do not necessarily mean that there are contextual effects taking

place. Rather than an individual's outcome being directly influenced by the composition of his peers in a true contextual effect, a correlation between social context and an individual's outcomes could be the result of a prior sorting exposure, which is mistakenly attributed to a true contextual effect (Cebolla Boado 2007). This mistake arises due to the collinearity of contextual effects and endogenous effects. These problems have been widely discussed in general fashion, and for neighbourhood and school contextual effects more specifically (e.g. Manski 2000; Dietz 2002; Hanushek et al. 2002).

To summarize problem briefly, non-random prior sorting can cause upward bias to estimates of contextual effects because omitted variables contribute to the school and residential sorting process but are also associated with the student's educational outcomes. This occurs because families have some choice over the neighbourhoods they live in and the schools they send their children to, and this choice is determined exogenously and in a non-random way (Duncan, Connell et al. 1997). The geographical distribution of families is partly influenced by financial constraints, meaning that families and students from the same geographical areas will share certain exogenous characteristics before any potential school-based interaction effects can influence behaviours. Further, students or their parents may choose to attend (or avoid) certain schools because of their ethnic or poverty composition. If this school selection process is non-random and correlated with the educational outcome variable of interest, then estimates of contextual effects may be biased.

The selection into survey bias problem is important to consider, however, the complete nature of the data used in this chapter means that selection bias is not as big an issue. This is because the National Pupil Database includes every child rather than just a sample and so whilst the assumption that the choice of school and neighbourhood is not exogenous is maintained, the

distribution of students across schools is known and thus allowing more accurate estimates of school context coefficients to be made.

This chapter attempts to address this issue by accounting for prior sorting through controls for year 7 school social context and analysing the effects of *changes* in school composition between school years 7 and 9. This approach relies on the assumption that parents and students have consistent preferences over school context/school type, that they assert these preferences at entry to secondary school, and that they do not subsequently change schools because of the ethnic and poverty compositions of the cohorts that subsequently enter the school. If these assumptions hold, then any changes in school composition between stages are more likely to be random rather than a result of a sorting preference.

Temporal and causal ordering issues also arise in contextual effects models (Blalock 1984), and so this chapter attempts to address this issue by using measures of prior stage (year 7) school context and changes in context between stages, both of which are temporally ordered before the KS3 assessment used to determine progress. It is likely that the KS2 assessment used to determine progress is conflated with KS2 social context, but controlling for KS2 prior attainment in the model avoids the omission of the effects of KS2 social context as these should be captured by the KS2 prior attainment measure.

There are also difficulties in identifying the precise mechanisms through which contextual effects arise (Farkas 1974). Blalock (1984) further notes that contexts are not mutually exclusive nor fixed in time, thus making it difficult to isolate individual contexts and the effects that arise from that context alone and from that time point alone, rather from some other higher level or parallel context or from some earlier time point. Some mechanisms suggested by authors for

contextual effects include a school culture of futility (Agirdag et al. 2012) and teacher effects through ability heterogeneity in high immigrant density schools (Cebolla Boado and Garrido Medina 2011). The lack of appropriate measures in the data makes it difficult to test these mechanisms in this chapter.

In addition there is Manski's (1993) more fundamental reflection problem of the identification of endogenous effects to consider. The reflection problem arises because of the difficulties in determining the direction of causality in a situation where effects may be occurring simultaneously. In longitudinal studies, this problem may be better resolved, but in cross-sectional studies the reflection problem means that strong claims of causality are hard to make. This study can address directions of causality by using as many measures as possible that are measured at an earlier point in time than the dependent variable. Multilevel modelling techniques allow the clustering of students within schools to be accounted for in the statistical analysis, meaning that variance can be partitioned across the levels in the analysis (school level and student level) and so standard errors can be correctly estimated (rather than under-estimated in a single level model).

2.6 Data and methods

This chapter uses the National Pupil Database (NPD) and Pupil Level Annual School Census (PLASC) datasets. The NPD/PLASC provides information on thousands of students, with data on their academic outcomes for school Key Stages 1 to 5. These students can be tracked through their school careers so primary school and secondary school contextual data is available. NPD/PLASC data is at the individual pupil level but it can be aggregated using school identifier data to create measures of school social context.

2.6.1 Sample

The NPD data selected for this analysis consisted of 555,624 cases from the school cohort born in between September 1994 and August 1995. All students are from schools in the state sector i.e. there is no information on independent school students. In the summer of 2010, this cohort were in Year 9 and were assessed for their KS3 maths and English subject levels, which, along with KS2 maths and English subject levels, are the levels relevant to this research. After cases were dropped where no positive measure of progress between KS2 and KS3 was available, 511,164 maths progress cases and 512,012 English progress cases were left. Students who made "negative" progress were excluded from the analysis (3,302 maths cases; 3,822 English cases) as such measures of progress in academic performance are a likely indicator of an incorrect academic assessment by the teacher either at KS2 or at KS3.

Of the cases that had a progress measure in at least one subject, 20,166 (3.89%) cases were recoded into the "Other" ethnic group as their ethnic group status was either unclassified, too broad (Other Asian, Other Black, Other), or from a group where the relative sample size was too small (White Romany, White Irish, and White Irish Traveller groups). This compares favourably to the 2.99% [15] of cases with an unclassified ethnic group status in the total Spring Census 2010 dataset. The Other Mixed, Mixed White and Asian, Mixed White and Black African, and Mixed White and Black Caribbean groups were combined into a single Mixed ethnicity group for the analysis. The data on ethnic status is reported by the student's parent or guardian and so can be

[15] There were 7,504,540 cases in the Spring Census 2010 dataset. Of these, 151,855 cases had an ethnic group status of "N/A"; the information was refused in 41,712 cases; the information had not been obtained at the time of the census in 30,775 cases; and the information was missing in 21 cases. This added to 224,363 cases with an unclassified ethnic group.

considered to be reasonably reliable. However, there may be differences between how the parent and how the child classify the child's ethnicity.

Plewis (2009: 6) notes that there are problems with ethnic classifications not being stable over time in that there are some cases where the student's ethnic grouping has changed between censuses, perhaps because of a change in the ethnic group options offered or some other change in the parent's response. In addition, due to reasons of confidentiality, very precise ethnic group classifications were not available and so the 22 category ethnic group classification (the "minor" ethnic group status variable) was used. Whilst this is preferable to the "major" ethnic group status variable, which has only very broad regional groupings, there are still some problems with over-generalisation and ethnic groups that are too broad in scope.

Students from all school funding and selection types were included in the analysis, as were schools of all sizes. Only those students with complete information for all five individual level variables of interest (sex, age in months, individual level poverty, KS2 prior attainment in the relevant subject, and ethnicity) were kept in the analysis. Age in months is grand-mean-centred for ease of interpretation of the coefficient. After excluding 1,206 cases where individual IDACI score (poverty) data was missing, and a further 3,918 cases where school-level measures of year 7 ethnic minority density and poverty density were unavailable, 500,307 year 9 student cases clustered in 3,385 schools were available for the analyses of maths progress. This was the final number of cases included in all the analyses of maths progress.

For the analysis of English progress, the same 1,206 cases missing information on individual IDACI score were excluded, alongside 3,935 cases missing information on year 7 school context.

This left 500,724 final student cases clustered in 3,366 schools available for all analyses of English progress.

Descriptive statistics for all variables used in the analyses in this chapter can be found in Table 19, Table 20, Table 21, and Table 22 in the Appendices, alongside a correlation matrix (Table 23).

2.6.2 Dependent variables

The dependent variable in this analysis is the educational progress made in maths and English between KS2 and KS3, measured in National Curriculum teacher assessed subject levels. Progress is calculated by subtracting the Key Stage 2 subject level from the Key Stage 3 subject level. Subject levels were chosen rather than points score as these are the measures reported in school league tables and school results, and are the more common currency used in the literature and in schools. Teacher assessed levels were used rather than subject tests to secure a greater sample size. This is because Key Stage subject tests were no longer mandatory in summer 2010, and so many schools did not sit the tests or provide data on the test results to the NPD. However, teacher assessments were still provided and so can be used as the outcome measure for all students to ensure consistency in the dependent variable across schools.

Teacher assessments may be more unreliable as they are more subjective, however it is expected that the large sample size will compensate for some of this unreliability. Different teachers provide the assessments for different subjects and so there is some variation in the reporting, which may help reduce systematic bias at the teacher level. It is expected that any systematic bias will be clustered at the school level and so can be taken into account through the use of multilevel modelling. Since teacher assessments are used at KS3, for consistency they are also

used at KS2 to calculate progress and to control for prior attainment. The KS2 prior attainment measure is standardised across the sample to adjust for the different ranges of KS2 attainment levels awarded in different schools.

2.6.3 Contextual measures

The ethnic contextual variables were created using the Spring Census 2008 and 2010 datasets, which have records for every student at school in England at the time of the censuses. The Spring Census 2008 was used to calculate the ethnic minority density measure for secondary school year 7. Only students attending secondary schools during 2007 and with a non-missing ethnic group code were included. The Spring Census 2010 was used to calculate the ethnic minority density measures for year 9. Only students attending secondary schools during 2010 and with a non-missing ethnic group code were included. School ethnic minority density is measured as the proportion of the school student body of non-White British ethnicity and can theoretically range from 0 to 1, where 0 indicates a school with only White British students and 1 indicates a school with only ethnic minority students. The change in ethnic minority density variable is calculated by subtracting year 7 ethnic minority density from year 9 ethnic minority density. The change in ethnic minority density variable is also included as a squared term to test for non-linear effects of changes in school ethnic composition.

Individual student level poverty is measured using the Income Deprivation Affecting Children Index (IDACI) score and is mean-centred for an easier interpretation of the score. Composite IDACI measures at the year 7 and year 9 school levels are created using the mean IDACI score of the students attending each school using the Spring Census data the same way as for the ethnic minority density measures. The change in school average poverty is calculated by subtracting

year 7 school average poverty from year 9 school average poverty. In this chapter, school average poverty is referred to as school poverty density.

IDACI was chosen over the more commonly used Free School Meals (FSM) indicator to measure poverty due to recent criticism of FSM as a poor quality poverty measure due to its lower take up rate amongst ethnic minorities and its instability over time due to the dynamic nature of poverty (Kounali, Robinson et al. 2007). Hobbs and Vignoles (2010) argue that FSM eligibility is not a good proxy for family income. IDACI is a broader measure of household income, taking into account means-tested benefits and tax credits, and so should be a more reliable indicator of poverty. Two school level control variables are the size of the school (mean-centred) and a dummy to indicate whether the school is a single sex girls' school. Controls for year 7 absolute ethnic minority density and year 7 absolute poverty density are also included as controls in the models.

2.6.4 Ethnic and poverty context of sampled schools

Change in school level ethnic minority density and poverty density are key independent contextual variables in this analysis. The distribution of the students across year 7-to-year 9 changes in ethnic minority density is as detailed in Table 1. The distribution of the students across values of year 7-to-year 9 change in poverty density is as detailed in Table 2.

Table 1 Distribution of students by change in ethnic minority density

Change in school ethnic density (X)	Maths student sample		English student sample	
	N	%	N	%
X < 2 s.d. below mean	16,167	3.23	16,131	3.22
2 s.d. below mean ≤ X < 1.5 s.d. below mean	8,633	1.73	8,588	1.72
1.5 s.d. below mean ≤ X < 1 s.d. below mean	13,923	2.78	13,918	2.78
1 s.d. below mean ≤ X < 0.5 s.d. below mean	29,885	5.97	29,854	5.96
0.5 s.d. below mean ≤ X < mean	95,927	19.17	96,253	19.22
mean ≤ X < 0.5 s.d. above mean	264,354	52.84	264,551	52.83
0.5 s.d. above mean ≤ X < 1 s.d. above mean	57,725	11.54	57,735	11.53
1 s.d. above mean ≤ X < 1.5 s.d. above mean	7,292	1.46	7,271	1.45
1.5 s.d. above mean ≤ X < 2 s.d. above mean	1,832	0.37	1,831	0.37
2 s.d. above mean < X	4,569	0.91	4,592	0.92
Total	500,307	100.00	500,724	100.00

Table 2 Distribution of students by change in poverty density

Change in school poverty density (X)	Maths student sample		English student sample	
	N	%	N	%
X < 2 s.d. below mean	11,591	2.32	11,555	2.31
2 s.d. below mean ≤ X < 1.5 s.d. below mean	3,374	0.67	3,368	0.67
1.5 s.d. below mean ≤ X < 1 s.d. below mean	4,798	0.96	4,778	0.95
1 s.d. below mean ≤ X < 0.5 s.d. below mean	12,894	2.58	12,796	2.56
0.5 s.d. below mean ≤ X < mean	155,332	31.05	155,559	31.07
mean ≤ X < 0.5 s.d. above mean	281,047	56.17	281,444	56.21
0.5 s.d. above mean ≤ X < 1 s.d. above mean	12,981	2.59	12,988	2.59
1 s.d. above mean ≤ X < 1.5 s.d. above mean	6,290	1.26	6,317	1.26
1.5 s.d. above mean ≤ X < 2 s.d. above mean	4,062	0.81	4,032	0.81
2 s.d. above mean < X	7,938	1.59	7,887	1.58
Total	500,307	100.00	500,724	100.00

2.6.5 Student characteristics

The student cases included in each of the samples for the final analyses were distributed by gender and minor ethnic group (as reported by each child's parents) as can be seen in Table 3. The vast majority of the sample is reported as belonging to the White British group. The smallest

numerical group is the Chinese group, but their exceptional progress in both maths and English (as can be seen in Figure 2) justifies the retention of this group in the analyses that follow.

Table 3 Maths and English sample populations by gender and ethnic group

Ethnic Group	Maths sample				English sample			
	Boys		Girls		Boys		Girls	
	N	%	N	%	N	%	N	%
White British	202,240	79.5	196,016	79.7	199,505	79.5	198,994	79.7
Bangladeshi	3,016	1.2	3,072	1.2	3,007	1.2	3,184	1.3
Indian	5,923	2.3	5,532	2.2	5,920	2.4	5,592	2.2
Pakistani	7,325	2.9	6,829	2.8	7,305	2.9	7,105	2.8
African	5,678	2.2	5,613	2.3	5,657	2.3	5,747	2.3
Caribbean	3,349	1.3	3,414	1.4	3,387	1.3	3,532	1.4
White Other	7,165	2.8	6,563	2.7	6,791	2.7	6,466	2.6
Chinese	816	0.3	883	0.4	789	0.3	864	0.3
Mixed	8,960	3.5	8,725	3.5	8,901	3.5	8,962	3.6
Other	9,922	3.9	9,266	3.8	9,672	3.9	9,344	3.7
Total	254,394	100	245,913	100	250,934	100	249,790	100

2.6.6 Ethnic differences in Key Stage 3 performance

The differences in average progress in the two subjects across ethnic groups can be seen in Figure 2 below. This figure shows the mean progress in each subject for each ethnic group relative to the White British reference group. It is evident from this figure that the Chinese group is making the most progress in both subjects for both boys and girls. The Indian and Other ethnicity groups also outperform the White British group in terms of progress for both genders and in both subjects. The combined Mixed group does not achieve very different mean progress

to the White British. Boys and girls from the Bangladeshi group make more progress in English but slightly less progress in maths. The same is true for the African group. In terms of struggling ethnic groups, the Pakistani group, and especially the Caribbean group, make less progress across the board. The disadvantage is particularly evident amongst the progress of both Caribbean boys and girls in Maths.

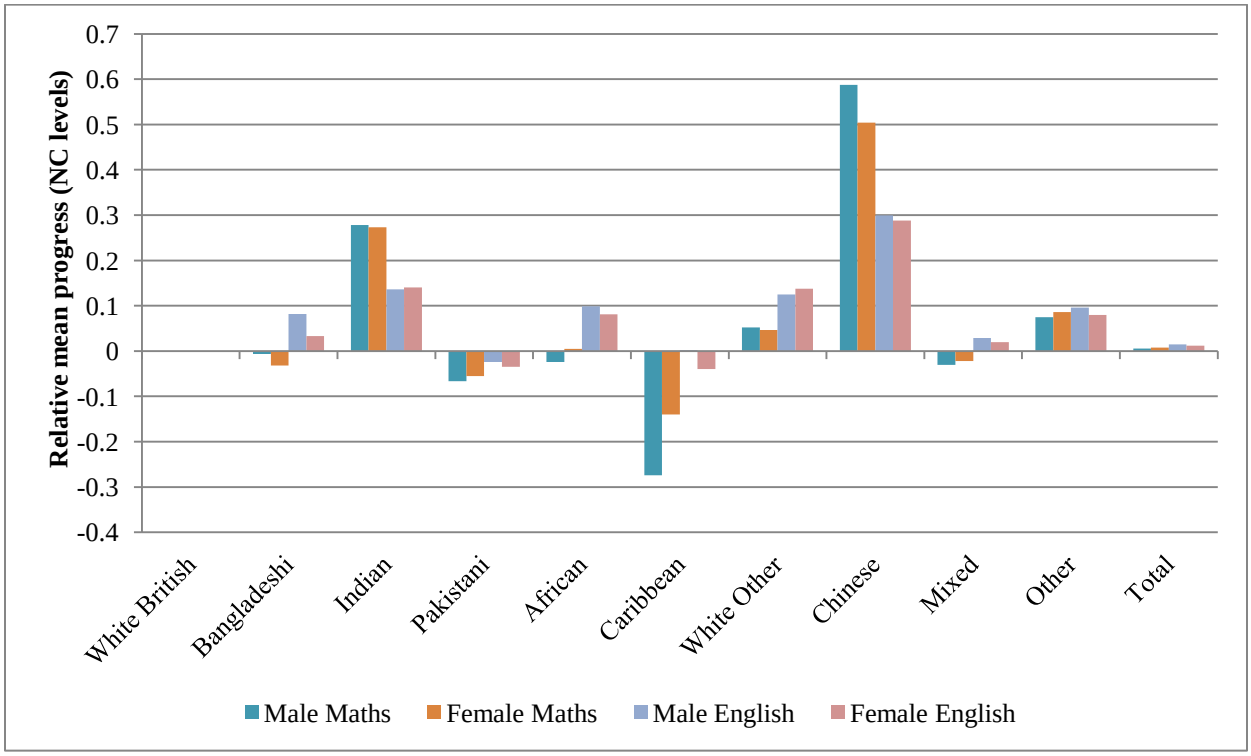


Figure 2 Differences in mean subject progress of ethnic groups compared to the White British group

2.6.7 Modelling technique

Multilevel modelling techniques are used as the data is structured in a hierarchical manner, with students (level 1) being nested in schools (level 2). The classroom level is not available for analysis in the data and so variation between classes within the same school is included in the variation at pupil level. The nesting of students within schools leads to clustered observations.

Multilevel modelling allows the correct modelling of the impact of school level characteristics on individual level outcomes by distributing the variance into a school level component and an individual level component. This allows more accurate estimation of level 2 coefficient standard errors, thus reducing the risk of inaccurate standard errors exaggerating the impact of level 2 effects on level 1 outcomes (Hox 2010).

The dependent variable is progress in the relevant subject measured in subject levels, and ranges from 0 to 4 for both subjects. For ease of analysis (due to the computational demands of multilevel models with such large sample sizes) the dependent variable is treated as linear and continuous. Models were estimated using the *xtmixed* command in STATA, which estimates multilevel linear regression coefficients. Repeats of the analysis using the variables from model 5 and treating progress as an ordinal categorical variable were carried out using the *GLLAMM* package in STATA, which allows multilevel ordered logistic regression models to be estimated. These results can be seen in Table 26 in the Appendix and support the findings of the models where the dependent variable is treated as linear and continuous, suggesting that these findings are robust to alternative model specifications. Similarly, the linear models were estimated separately by ethnic group (not shown here for reasons of space) and the results for the separately estimated models are similar to the results for the interactions presented in the Appendix.

2.6.8 Modelling strategy

Individual level controls will be introduced in model 1, including a female dummy, a mean-centred poverty score measure, a mean centred measure of the student's age in months, and

standardised KS2 prior attainment level in the relevant subject[16]. In model 1, the ethnic group dummies will also be introduced and will indicate differences in progress relative to the White British group. The nine main ethnic groups in the analysis are Bangladeshi, Indian, Pakistani, Black African, Black Caribbean, Chinese, Mixed, White Other, and Other ethnicity[17]. A dummy for the student's use of English as an additional language was originally included but was found to be over controlling and collinear with some ethnic groups and so was dropped from the analysis. Unfortunately information on family structure and generational statues are not available in this dataset and so these important variables cannot be considered in this study.

School level controls will be introduced in model 2, including controls for school size and a girls' school dummy[18]. In model 3, the year 7 school ethnic minority density and poverty density controls will be included. Model 4 keeps all prior variables and introduces the year 7-to-year 9 changes in school ethnic minority density and poverty density. Model 5 introduces squared terms for these changes in context variables.

In model 6 interactions between each ethnic group and both change in school ethnic minority density variables (change in ethnic minority density and change in ethnic minority density squared) are introduced, with fixed effects of change in school poverty density and change in school poverty density squared for all ethnic groups. In model 7 interactions between each ethnic group and both change in school poverty density variables (change in poverty density and change

[16] This variable was included to control for prior attainment and to better account for the various relevant and presumably constant (but unmeasured) factors that are associated with progress and attainment e.g. parenting styles, family size, student motivation.

[17] The Other ethnicity group is used to categorise students that do not report belonging to any of the other 8 ethnic groups listed previously.

[18] A variable for the proportion of the school that is female was originally included, but did not significantly influence the results and so was dropped from the analysis.

in poverty density squared) are introduced, with fixed effects of change in school ethnic minority density and change in school ethnic minority density squared for all ethnic groups.

Finally, in model 8, a full set of interactions are introduced so that each ethnic group is interacted with change in school ethnic minority density, change in school ethnic minority density squared, change in school poverty density, and change in school poverty density squared. This is to test for simultaneous differences in effects of ethnic minority density and poverty density for each ethnic group. To ease interpretation, the estimates from models 6 to 8 for each subject are represented by predictive margins graphs. Full model tables can be found in the Appendix.

2.7 Results

A summary of the key findings will be presented first, before a more detailed analysis and discussion of results.

2.7.1 Key findings

1. There is evidence of positive contextual effects of school ethnic minority density and negative contextual effects of poverty density on progress in maths and English.
2. The magnitude and direction vary by ethnic group and type of contextual effect under investigation.
3. When the effect of year 7-to-year 9 change in school poverty density is fixed across ethnic groups, year 7-to-year 9 change in school ethnic minority density is significantly positively associated with progress in maths and English for all ethnic groups. The positive associations between changes in ethnic minority density and progress are non-linear i.e. there are diminishing returns to progress as year 7-to-year 9 changes in school ethnic minority density

increase. This finding suggests that "White flight" from ethnically dense KS3 schools is not logical when considering academic progress.

4. When the effect of year 7-to-year 9 change in school ethnic minority density is fixed across ethnic groups, year 7-to-year 9 change in school poverty density is significantly negatively associated with progress in maths and English for all ethnic groups. The association is non-linear i.e. the rate of loss of progress reduces as year 7-to-year 9 changes in poverty density increase. This finding suggests that deprived student populations may have a negative effect on the attainment and progress of students over and above their own level of poverty.
5. The contextual effects of year 7-to-year 9 changes in school ethnic minority density and school poverty density appear to be very similar across ethnic groups. Most interactions are insignificant, but progress outcomes across the range of year 7-to-year 9 changes in school ethnic minority density and school poverty density do suggest differential (but mostly insignificant) effects of context for different ethnic groups. Further, these contextual effects do not completely explain ethnic differences in progress.
6. In general it appears that most of the variance is at the student level, suggesting that individual level factors may be more influential on the outcomes of interest rather than those at the school level.
7. Nevertheless, there are some important school contextual effects identified in this study, which strongly implies that school social context can contribute to educational outcomes above and beyond individual characteristics.

The results of the analysis will be presented and discussed below. Table 4 shows the results for models one to five for progress in maths. Table 5 shows the same models for progress in English.

These first five models are without interactions by ethnic group, and so relevant coefficients will be discussed briefly, before moving on to discussing differential effects by ethnic group.

All models include controls for sex, age, individual level poverty (IDACI score), and standardized prior attainment (KS2 level in the relevant subject). Due to space constraints, and so as to focus on the key covariates of interest, the coefficients for these controls are not shown in the main results tables. It is sufficient to state here that the coefficients behave as expected in both subjects: girls make significantly more progress than boys; older students make significantly more progress than younger students; poorer students make significantly less progress than more affluent students. Students who have higher prior attainment in maths make significantly more progress. This could be because these students are actually brighter or more able at maths. Alternatively, prior attainment could capture (unmeasured) parental social class effects. The only unexpected finding is that students who have higher prior attainment in English make significant less progress. This is possibly due to a ceiling affect in the English levels awarded at KS3 – high-achieving students at KS2 are potentially limited in the progress they can make at KS3 because of some sort of levelling-off effect[19].

Models six to eight for progress in maths and in English can be found in Table 24 and Table 25 in the Appendices. They are not shown or discussed in this section due to the complexity involved in the interpretation of multiple interaction effects. Instead, graphs of predictive margins are the preferred method of presentation to demonstrate the relevant effects for each

[19] There is evidence of this in the distributions of maths and English KS3 levels. Whereas over 23% of students achieve level 7 or 8 in maths at KS3, just over 12% do so in English. Further, 8.7% of the maths sample achieves level 8, but only 0.7% of the English sample does so. This suggests that the higher levels in English are relatively uncommon compared to in maths.

ethnic group. The graphs show the trends in the contextual effects under consideration[20]. Progress in maths will be discussed first; progress in English will follow second.

2.7.2 Progress in Maths

Table 4 shows the results of the models for progress in maths. Model 1 indicates that after controlling for relevant other individual factors (detailed in the table note), eight out of the nine ethnic groups under analysis make significantly more progress in maths than the ethnic majority White British group. Only the Caribbean group make significantly less progress than the reference group. Model 2 introduces two school level controls and shows that students at larger schools, and at schools with female students only, make significantly more progress.

Model 3 brings in the two year 7 contextual controls – year 7 school ethnic minority density and year 7 school poverty density. Results suggest significant positive associations between maths progress and year 7 school ethnic minority density. Model 3 also shows significant negative associations between maths progress and year 7 poverty density. These results suggest that there are effects of prior school stage student composition on educational progress. Further, the relative size of the effects indicates that school poverty density has a greater effect (over four times as great) on progress than ethnic minority density. All ethnic group main effects remain significant.

In model 4, the two main contextual effects of interest are simultaneously introduced. These two changes in school context effects are the *change* in ethnic minority density between school year

[20] The horizontal axes of all graphs range from -1 to 1, however estimates beyond the range of -0.5 to 0.5 for both changes in ethnic minority density and changes in poverty density should be taken with caution. Limited case numbers in the extremes of the range make the reliability of estimates beyond 0.5 in both directions more unreliable, but are shown here for the sake of completeness.

7 and school year 9, and the *change* in poverty density between school year 7 and school year 9. The results in model 4 favour H2a over H1a as increases in year 7-to-year 9 ethnic minority density are associated with greater progress in maths. H3a is also supported as increases in year 7-to-year 9 poverty density are associated with reduced progress. In terms of effect sizes, the effect of a change in poverty density is almost twice that of a chance in ethnic minority density. The other four school level effects remain significant, and the size of the year 7 school ethnic minority density and year 7 school poverty density effects increase.

Model 5 shows that the main effect of year 7-to-year 9 change in ethnic minority density is positive but the significant quadratic term shows it is also curvilinear. This suggests that the rate of increase of maths progress associated with year 7-to-year 9 change in ethnic minority density reduces as the size of the change increases. Model 5 also shows the opposite effect for year 7-to-year 9 change in poverty density, in that the main effect here is negative but the association is also curvilinear. This indicates that the rate of reduction of maths progress associated with change in poverty density reduces as the size of the change increases. BIC statistics suggest the each model improves upon the previous model.

Table 4 Summary of results predicting progress in maths

	Model 1		Model 2		Model 3		Model 4		Model 5	
	b	**s.e.**	**b**	**s.e.**	**b**	**s.e.**	**b**	**s.e.**	**b**	**s.e.**
Ethnic group (ref=White British)										
Bangladeshi	0.19***	(0.01)	0.19***	(0.01)	0.20***	(0.01)	0.20***	(0.01)	0.20***	(0.01)
Indian	0.24***	(0.01)	0.24***	(0.01)	0.24***	(0.01)	0.23***	(0.01)	0.23***	(0.01)
Pakistani	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)	0.10***	(0.01)
African	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)
Caribbean	-0.04***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)
White Other	0.08***	(0.01)	0.08***	(0.01)	0.08***	(0.01)	0.08***	(0.01)	0.08***	(0.01)
Chinese	0.40***	(0.02)	0.40***	(0.02)	0.40***	(0.02)	0.40***	(0.02)	0.40***	(0.02)
Mixed	0.01*	(0.01)	0.01*	(0.01)	0.01*	(0.01)	0.01*	(0.01)	0.01*	(0.01)
Other ethnicity	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)
School size (mean centred)			0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Girls only school			0.20***	(0.02)	0.18***	(0.02)	0.15***	(0.02)	0.15***	(0.02)
Ethnic density in year 7					0.18***	(0.02)	0.41***	(0.03)	0.41***	(0.03)
Average poverty in year 7					-0.73***	(0.03)	-1.16***	(0.05)	-1.15***	(0.05)

Change in school ethnic minority density (year 7-to-year 9)							0.33***	(0.03)	0.26***	(0.03)
Change in school average poverty (year 7-to-year 9)							-0.61***	(0.06)	-0.75***	(0.06)
Change in school ethnic density sq.									-0.22***	(0.04)
Change in school average poverty sq.									-1.85***	(0.15)
Constant	1.65***	(0.01)	1.66***	(0.01)	1.79***	(0.01)	1.85***	(0.01)	1.84***	(0.01)
Level 2 variance	0.08***	(0.00)	0.08***	(0.00)	0.06***	(0.00)	0.06***	(0.00)	0.06***	(0.00)
Level 1 variance	0.52***	(0.00)	0.52***	(0.00)	0.52***	(0.00)	0.52***	(0.00)	0.52***	(0.00)
Level 2 Units	3385		3385		3385		3385		3385	
Level 1 Units	500307		500307		500307		500307		500307	
BIC	1107273		1106964		1106334		1106214		1105965	

*Notes: The following controls were included in all models but are not shown above for space reasons: female, student poverty (grand mean centred), age in months, standardised prior attainment (Key Stage 2 maths level). Full results can be seen in the Appendix. Significance indicated as follows: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001. Standard errors are in parentheses.*

Turning now to Figure 3, this graph is based on the predicted outcome taken from maths model 6. In model 6 change in poverty density and change in poverty density squared have constant effects for all groups, whilst the effects of change in ethnic minority density and change in ethnic minority density squared are interacted by each ethnic group. In Figure 3 it is clear to see that increases in ethnic minority density between year 7 and year 9 are associated with higher progress in maths for almost all ethnic groups, expect the Chinese group[21]. However, the size of the increase in progress is small.

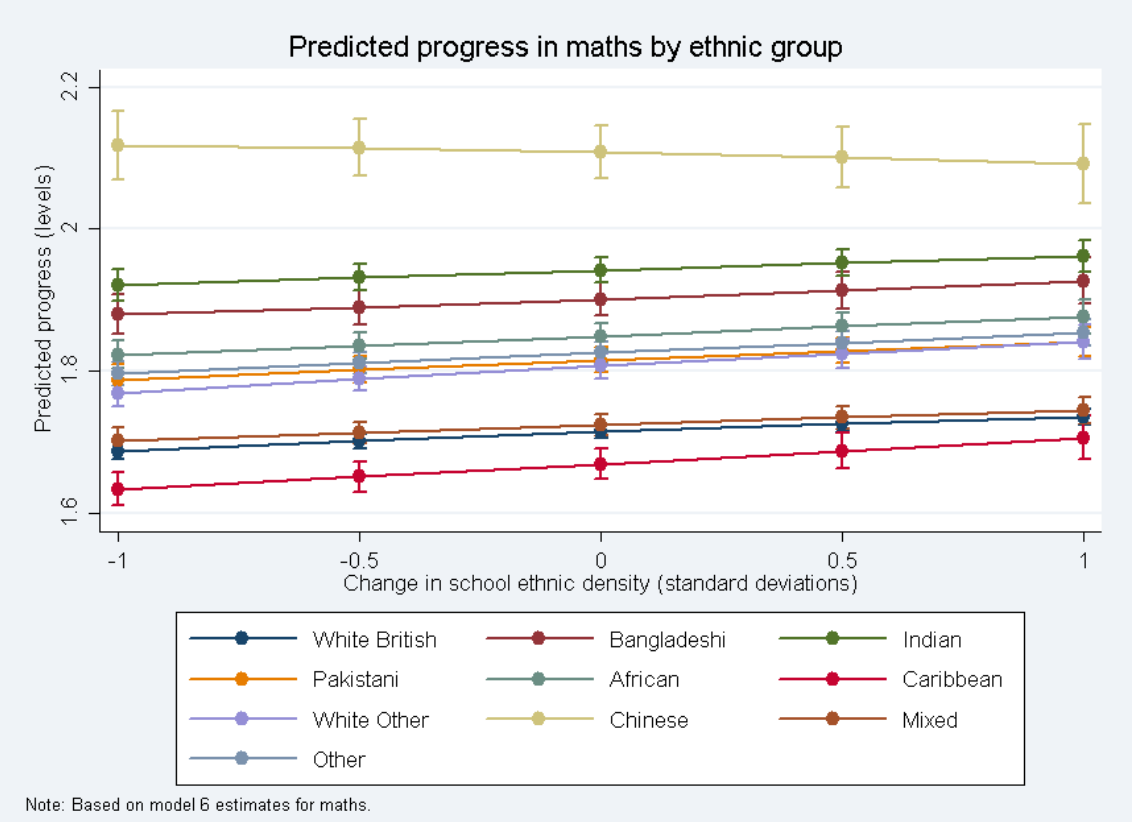


Figure 3 Predicted progress in maths for each ethnic group by year 7-to-year 9 change in ethnic minority density

The differences in effects across ethnic groups are not significant (no significant interaction effects) and there is not much variation across groups in the size of the effects[22].

[21] It is possible results are not seen for the Chinese group because of relatively low case numbers.
[22] Only the squared terms for change in ethnic minority density for some groups are significant, but there is a risk of false positives when fitting so many interactions in one model.

Nevertheless, the BIC statistic for model 6 suggests it fits the data better than model 5. As such, the results do suggest differences in the effects of change of ethnic minority density across ethnic groups. Whilst the interaction effects between ethnic group and change in ethnic minority density themselves are insignificant, the ethnic differences in predicted progress in maths are mostly significant.

Figure 4 is based on maths model 7 and shows predicted outcomes when the change in ethnic minority density main and squared effects are the same for all groups, whilst the change in poverty density main and squared effects are interacted by each ethnic group. The trends are negative compared to those in Figure 3 and the slopes are less steep.

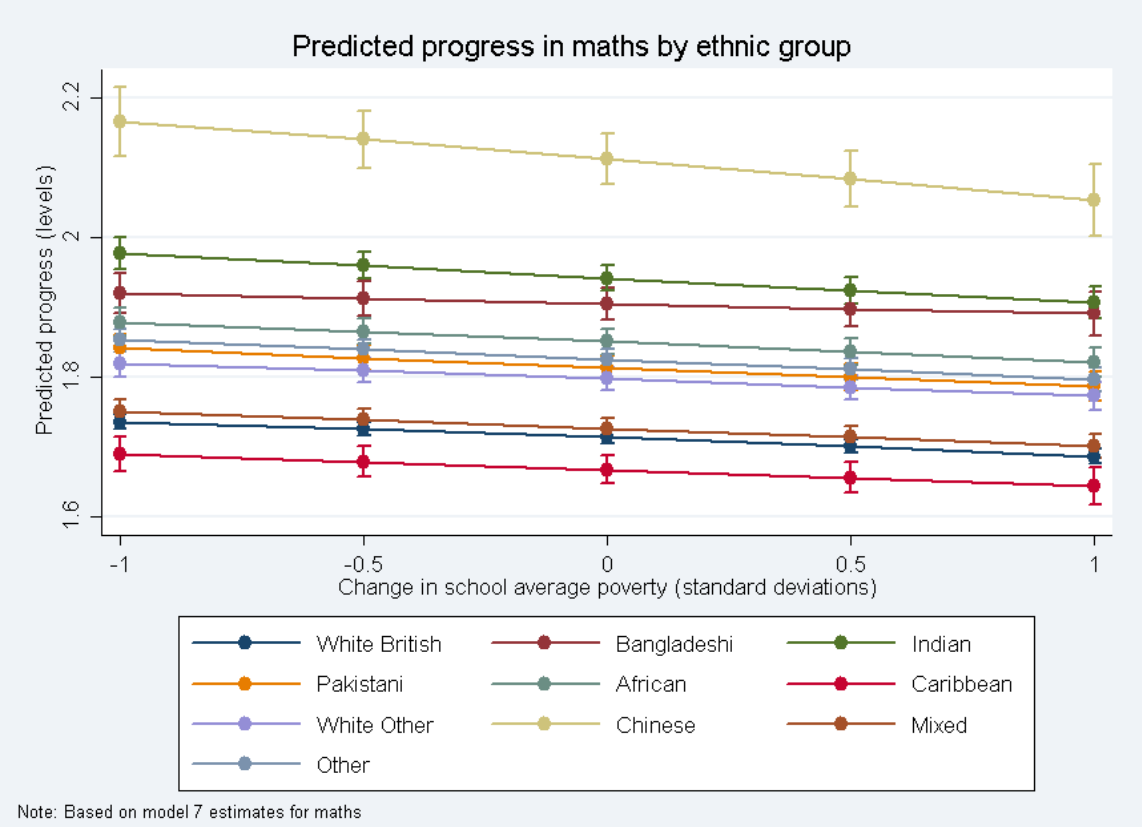


Figure 4 Predicted progress in maths for each ethnic group by year 7-to-year 9 change in school poverty density

It is possible to see that predicted progress in maths decreases as school poverty density increases (points to the right of zero change on the horizontal axis) for all ethnic groups.

Ethnic group lines typically have a negative (although shallow) gradient, suggesting that reductions in poverty density between year 7 and year 9 are associated with more progress. This mirrors the previous research suggesting concentrations of economic disadvantage negatively affect educational outcomes (e.g. Caldas and Bankston 1997; Rumberger and Palardy 2005; Coleman et al. 1966).

The BIC statistic for model 7 suggests that it fits the data better than model 6 and so interactions between year 7-to-year 9 change in school poverty density and ethnic group are preferred to those between year 7-to-year 9 change in school ethnic minority density and ethnic group when predicting progress in maths.

2.7.3 Progress in English

Turning now to the results for progress in English, Table 5 shows effects almost entirely the same as those presented for models one to five in maths, and so a detailed discussion will not be repeated. To summarize, Table 5 model 3 provides support for H2b and rejects H1b, as there is a significant positive association between increases in year 7-to-year 9 ethnic minority density and English progress. H3b is also supported as there is a significant negative association between increases in year 7-to-year 9 poverty density and English progress. The effects of change in ethnic minority density and change in poverty density (based on model 4 estimates) are 0.29 and -0.38 respectively, suggesting that increases in poverty density have a bigger effect on progress in English than do increases in ethnic minority density. The only two major differences are that the Caribbean coefficients are not significantly different to the White British reference group when considering progress in English, and that the general size of the main ethnic group effects are smaller. This suggests that the progress gap between most ethnic minority groups and the White British group is typically smaller in English than it is in maths.

Table 5 Summary of results predicting progress in English

	Model 1		Model 2		Model 3		Model 4		Model 5	
	b	**s.e.**	**b**	**s.e.**	**b**	**s.e.**	**b**	**s.e.**	**b**	**s.e.**
Ethnic group (ref=White British)										
Bangladeshi	0.13***	(0.01)	0.13***	(0.01)	0.13***	(0.01)	0.13***	(0.01)	0.13***	(0.01)
Indian	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)	0.13***	(0.01)
Pakistani	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)
African	0.11***	(0.01)	0.10***	(0.01)	0.11***	(0.01)	0.10***	(0.01)	0.11***	(0.01)
Caribbean	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
White Other	0.09***	(0.01)	0.09***	(0.01)	0.09***	(0.01)	0.09***	(0.01)	0.09***	(0.01)
Chinese	0.23***	(0.02)	0.22***	(0.02)	0.22***	(0.02)	0.22***	(0.02)	0.22***	(0.02)
Mixed	0.03***	(0.00)	0.03***	(0.00)	0.03***	(0.00)	0.03***	(0.00)	0.03***	(0.00)
Other ethnicity	0.06***	(0.00)	0.06***	(0.00)	0.06***	(0.00)	0.06***	(0.00)	0.06***	(0.00)
School size (mean centred)			0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Girls only school			0.21***	(0.02)	0.20***	(0.02)	0.16***	(0.02)	0.16***	(0.02)
Ethnic density in year 7					0.11***	(0.01)	0.33***	(0.03)	0.32***	(0.03)
Average poverty in year 7					-0.39***	(0.03)	-0.69***	(0.05)	-0.68***	(0.05)

Change in school ethnic minority density (year 7-to-year 9)							0.29***	(0.03)	0.23***	(0.03)
Change in school average poverty (year 7-to-year 9)							-0.38***	(0.06)	-0.49***	(0.06)
Change in school ethnic minority density sq.									-0.15***	(0.04)
Change in school average poverty sq.									-1.65***	(0.13)
Constant	1.10***	(0.01)	1.11***	(0.01)	1.18***	(0.01)	1.21***	(0.01)	1.21***	(0.01)
Level 2 variance	0.08***	(0.00)	0.08***	(0.00)	0.08***	(0.00)	0.07***	(0.00)	0.07***	(0.00)
Level 1 variance	0.39***	(0.00)	0.39***	(0.00)	0.39***	(0.00)	0.39***	(0.00)	0.39***	(0.00)
Level 2 Units	3366		3366		3366		3366		3366	
Level 1 Units	500724		500724		500724		500724		500724	
BIC	957107		956827		956617		956559		956320	

*Notes: The following controls were included in all models but are not shown above for space reasons: female, student poverty (grand mean centred), age in months, standardised prior attainment (Key Stage 2 maths level). Full results can be seen in the Appendix. Significance indicated as follows: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001. Standard errors are in parentheses.*

In Figure 5, as with the similar figure for maths, predicted progress in English for each ethnic group increases as the year 7-to-year 9 school ethnic minority density increases. Again, this is in contrast to much of the previous research suggesting negative associations between ethnic minority density and educational outcomes (e.g. Brännström 2008; Bankston and Caldas 1996; Felouzis 2003; Plewis 2009).

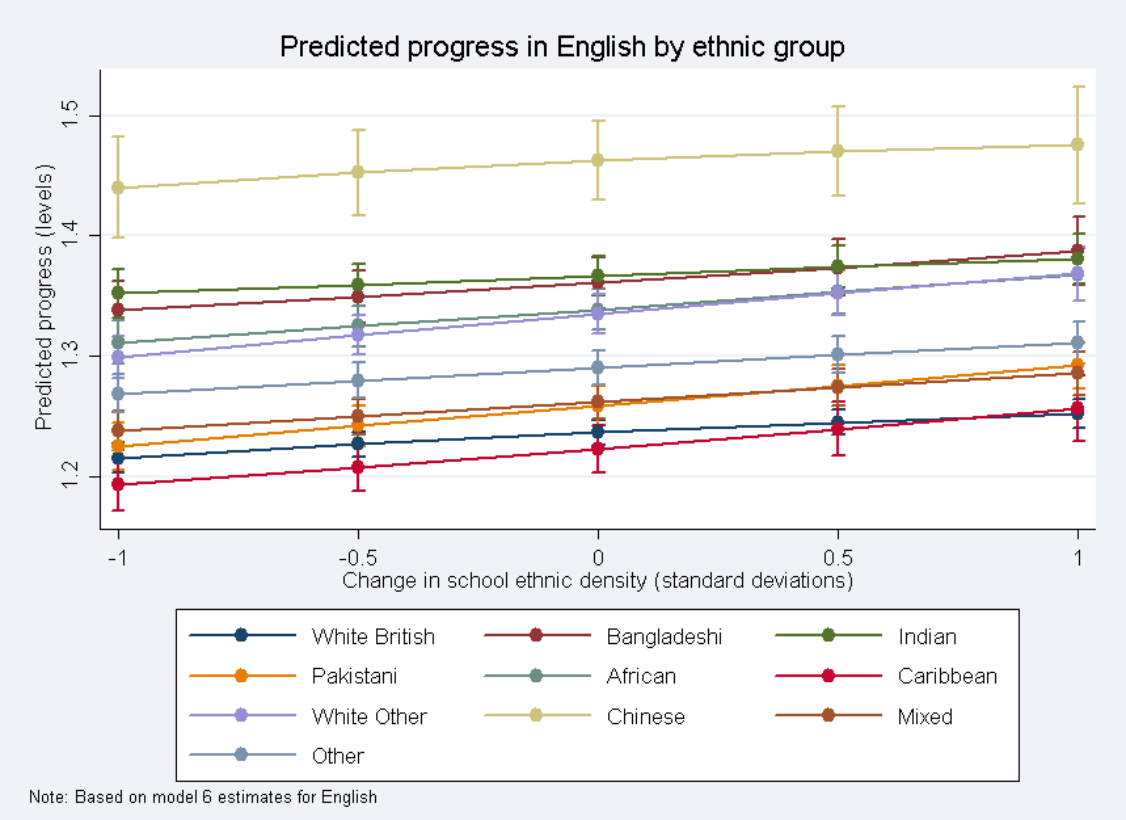


Figure 5 Predicted progress in English for each ethnic group by year 7-to-year 9 change in ethnic minority density

It is worth noting that the rate of increase in progress reduces (the slope of the line flattens) for the White British and Chinese groups over the ethnic minority density range. This suggests that these groups do not gain as much from increased ethnic minority density when it comes to progress in English. This makes sense for the White British group as they can be considered "native" English users and so it is possible that greater proportions of potential "non-native" English users in the school reduce the rate of progress in English for the White British group due to the greater presence of

potentially lower quality English in school. The effects for the Chinese group may be due to similar explanations, as many Chinese students are first generation immigrants and so may benefit academically (at least with regards to English progress) by attending schools with greater proportions of "native" English-using White British students rather than schools with greater proportions of ethnic minority students. The specific ethnic groups contributing to increases in the change in ethnic minority density may also make a difference. However such an investigation is beyond the focus of this chapter.

In Figure 6 it can be seen that, as with the equivalent figure for maths, increases in year 7-to-year 9 poverty density are negatively associated with progress for almost all ethnic groups, apart from the Chinese group.

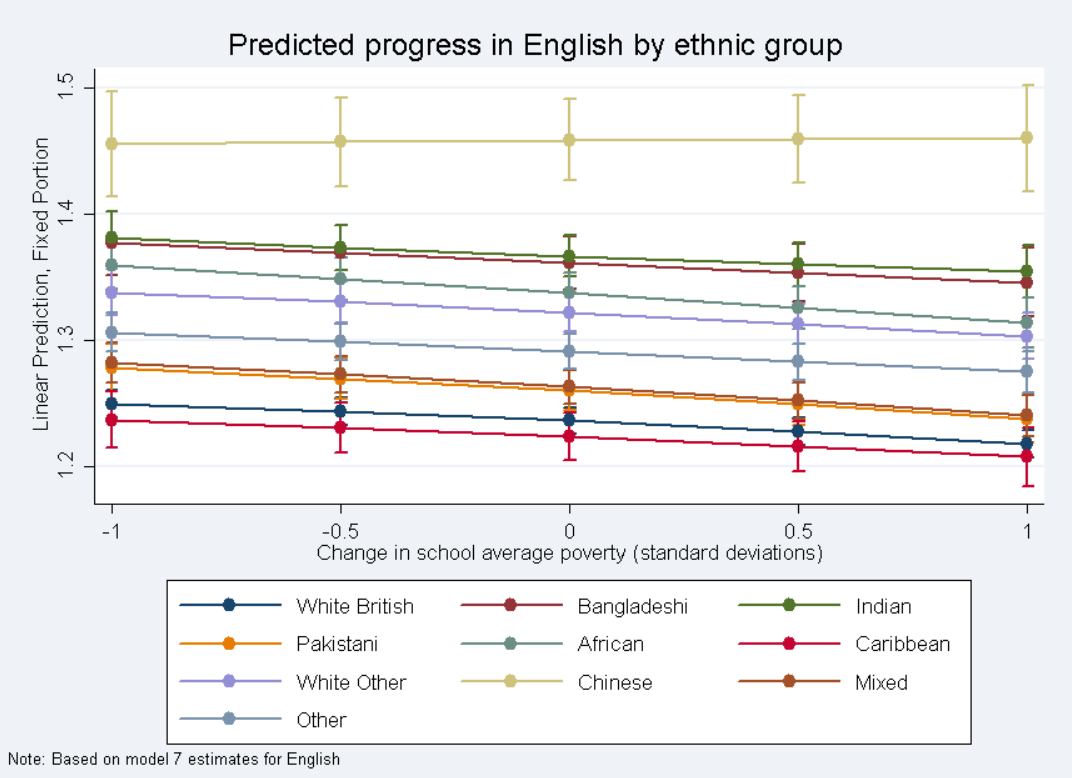


Figure 6 Predicted progress in English for each ethnic group by year 7-to-year 9 change in poverty density

Again, the White British group makes significantly lower progress than almost all other ethnic groups as poverty density increases. This finding of lower progress for White British students at higher levels of poverty density can be reasoned out by considering the possibility that White British students are less resilient to poverty than ethnic minority students. Assuming this is the case, then the larger predicted differences (between the White British group and some ethnic minority groups) when poverty density increases make sense. The larger predicted differences occur because when poverty density increases, the less resilient White British group makes less progress, whilst some ethnic minority groups (Bangladeshi, Indian, Chinese and Other groups) may be more resilient, and so able to make more progress. The hypothesised difference in poverty resilience across ethnic groups leads to greater differences in progress when poverty density increases than when it decreases. Note, however, that it is not possible to empirically test for resilience to poverty with this data so this explanation is simply put forward as speculation rather than supported with evidence.

2.8 Conclusion

This study has investigated the role of school contextual effects of ethnic minority density and poverty density on progress between Key Stage 2 and Key Stage 3 in maths and English. The results show generally positive associations between increases in year 7-to-year 9 ethnic minority density and progress; and generally negative associations between increases in year 7-to-year 9 poverty density and progress. Both sorts of contextual effects were found to have non-linear patterns in associations. There is some variation in the strength of associations between progress and school context across ethnic groups, when compared to the White British reference group.

The positive associations between ethnic minority density and progress are not that surprising in the context of England. While much research from the US and Europe has outlined negative associations between ethnic concentration and educational outcomes (e.g. Brännström 2008; Bankston and Caldas 1996; Felouzis 2003; Plewis 2009), in England the majority group is often academically out-performed by many ethnic minority groups. The divergent results of this paper could be driven by the inclusion of contextual poverty measures. Once school poverty context is controlled for (model not shown here), higher ethnic density schools out-perform lower ethnic density ones, and so failing to control for school poverty context mistakenly attributes negative contextual effects of poverty to ethnic context instead. Therefore, this research counters most past research from the UK, Europe, and the US, which propose negative ethnic contextual effects.

This research chapter counters the findings of Hamnett and colleagues (Hamnett et al. 2007), and of Cline and colleagues (Cline et al. 2002). Both of those studies found negative effects of high ethnic density on the performance of all students, and noted that White British students did better in White majority schools. In contrast, this research chapter finds that not only are there almost no negative effects of increases in year 7-to-year 9 ethnic density on the progress of White British students, but in fact there are positive effects of increases in year 7-to-year 9 ethnic density on the educational progress of White British students.

Evidence of the out-performance of some ethnic groups exists for absolute attainment and for university transitions given attainment (Rothon 2005; Rothon et al. 2009), and this paper has found the out-performance also exists for academic progress made between Key Stage 2 and Key Stage 3. Why might higher concentrations of ethnic minority students improve progress over and above individual characteristics? There are

three possible mechanisms here. Firstly, it is possible that schools with high ethnic minority densities adapt teaching styles and school policies to better cater for the educational needs of ethnic minorities, thus aiding progress. Secondly, it is possible that the prevailing school and student culture in high ethnic minority density is somehow more conducive to educational progress. Such a culture could perhaps arise through a collective "immigrant optimism" (Kao and Tienda 1995) and the resulting positive educational spill-overs that arise through being educated with high-performing or highly motivated ethnic minority students; through a culture that is less-alienating than that found in a "predominantly white, status-oriented class, [which] does nothing to enhance a black child's self-esteem" (Gerard 1983) or through increased ethnic solidarity and stronger ethnic identities (Matute-Bianchi 1986; Bankston 1995; Bankston and Zhou 1995). Thirdly, it could be that ethnic minority students begin to make faster progress than White British students at this stage in education, thereby catching up to the outcomes of the White British students who had been academically ahead during the earlier stages. As such, White British students at higher ethnic minority density schools benefit from the rapid progress of their peers as this helps them also speed up their own progress.

Poverty density seems to be the bigger driver of the two contextual measures analysed here and reaffirms the findings of previous research that concentrations of students from low socio-economic backgrounds are associated with academic disadvantage (e.g. Caldas and Bankston 1997; Rumberger and Palardy 2005; Coleman et al. 1966). Worthy of particular attention is the interplay between the two contextual effects. Year 7 school ethnic minority density is only positively associated with progress once poverty density is also controlled for in the model (results not shown in this chapter). This leads to the inference that White British students and ethnic minority students

experience different levels of resilience to contextual poverty, in that schools that have concentrations of poverty can potentially reduce the negative effect of this by increasing the ethnic minority proportion of the student population. Such redistribution of students is not necessarily socially or politically desirable and is not the main implication of this research. Rather, the main implication of this research is that concentrated poverty leads to additional educational disadvantages for all students, whilst concentrations of ethnic minority students can lead to educational advantages, especially in situations of concentrated poverty.

Expanding on this main implication, it seems that positive interactions for some groups between ethnic group and poverty density, and ethnic group and ethnic minority density measures, suggest that schools with deprived populations can limit their disadvantage by ensuring they have higher ethnic minority concentrations. Predictions for the greatest disadvantages exist for schools with high poverty density and low ethnic minority density i.e. the lowest progress is predicted to be made by deprived White British students attending schools with many other deprived White British students. The relative resilience of the Bangladeshi and Indian groups to contextual effects of poverty are of interest and may help to explain the recent gains in education made by the Bangladeshi and African groups especially.

Further research is needed to better understand how contextual effects on educational performance operate. Mechanisms have been proposed by researchers in the field, but as yet there is no clear consensus or evidence on how contextual effects influence outcomes. It is also important to better understand density and also diversity effects more generally. Finally, this research contributed to the field by investigating an under-researched stage of the school career, but it is important to explore the persistence of these contextual effects and to understand the role they play at all levels of the

educational system, and also beyond the school context. In this way, the contributions of school (and other) social contexts to ethnic differences in educational outcomes can be better understood and addressed.

Chapter 3: Individual and school cohort level associations between religious behaviours and university aspirations

3.1 Introduction

The first empirical chapter in this thesis investigated the role played by the social context of the school and attempted to determine whether compositional effects at the whole school level contributed to interethnic differences in education. This second empirical chapter considers individual and school cohort level measures of religiosity and investigates how religious attitudes and behaviours are associated with students' aspirations of attaining a university education. The study attempts to determine whether ethnic differences in educational outcomes are driven by differences in religious attitudes and behaviours across groups.

There is a growing body of evidence to suggest that belonging to religious organisations and participating in religious behaviours have positive effects on educational outcomes (e.g. Zern 1989; Walker and Dixon 2002; Jeynes 2003a). Religiosity is thought to have both direct and indirect effects on educational outcomes, with indirect effects operating through student friendship preferences, avoidance of delinquent behaviour, improved discipline and work-ethic, increased self-esteem, increased internal locus of control, and lower stress and depression, amongst other pathways (for a review see Jeynes 2002).

Past research has suggested that religious behaviours have added beneficial effects for children who live in urban areas (Jeynes 2003a), high-poverty neighbourhoods (Regnerus and Elder 2003), and who are immigrants (Zhou and Bankston 2002). Given the geographical concentration of ethnic minority students in England in city localities, the economic disadvantage experienced by some ethnic minority groups, and the first

generation status of many ethnic minority students in the England, it seems that religiosity based explanations for differences in educational outcomes may be highly relevant and particularly valid for these groups.

There is, however, limited empirical research investigating whether ethnic differences in education can be explained by differences in religiosity. Purdam and colleagues note that our understanding of the relevance of religion in the lives of people living in the UK, especially ethnic minorities, is limited (Purdam, Afkhami et al. 2007). This appears especially to be the case with regards to links between religion and education in the UK. Authors have recently begun to argue that belonging to religious organisations and holding religious and spiritual beliefs facilitate the academic success of young minority students (e.g. Zhou and Bankston 2002; Jeynes 2003b; Clark, Brooks et al. 2006). Given the reasonably strong overlaps between ethnic group identification and religious affiliation in the UK, especially amongst south Asian groups (Coward, Hinnells et al. 2000; Weller 2004), it is plausible that ethnic differences in educational outcomes are driven to a considerable extent by religious (religious affiliation and religiosity) differences.

Based on previous research, it is expected that children who express religious attitudes (religion is important to them), demonstrate religious behaviours (pray), and belong to religious communities (visit places of worship) will have higher educational outcomes (aspire to university) than their similar peers who do not. This research chapter will test whether this is the case.

The data to be analysed come from the first wave of information on English students from the Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU) (Kalter et al. 2013). The CILS4EU project investigates the structural, social,

and cultural integration of ethnic minority young people across countries over time. The dataset used here is large and nationally representative, comprising adolescents surveyed in 107 schools across England. The cross-sectional nature of the data used in this chapter make it difficult to accommodate the theoretical causal ordering of independent and dependent variables, meaning that any effects found cannot be proven to be necessarily causal in their nature.

The outcome measure of interest in this chapter is the likelihood of reporting an aspiration to attain a university degree. The student reports this realistic aspiration when they are in school year 10 i.e. at least three academic years prior to the potential university entrance for almost all students (barring the exceptionally bright early entrants). The relevance of this educational measure is discussed in further detail later in this chapter. There are three main predictor variables of religiosity at the individual level to be tested in this study: self-reported importance of religion, frequency of prayer, and frequency of visits to places of worship. These individual level religiosity measures are combined into a religiosity scale. Scores on the religiosity scale are aggregated to a school cohort average religiosity measure, which is tested in turn for its associations with aspiring to attend university. Associations between attending a religiously affiliated school and aspiring to attend university, and between individual religious affiliation and university aspirations, are investigated. Interactions between ethnic group and individual religiosity are also tested for to see whether effects of religiosity vary significantly by ethnic group. Details of all measures in the study will be expanded upon later in the chapter.

In summary, this thesis chapter investigates associations between individual level and school cohort level religiosity and realistic university aspirations using CILS4EU data. The study aims to understand how associations between ethnicity and academic

aspirations can be explained by religiosity. Further this chapter intends to identify any academic advantages or disadvantages individual students accrue through their own religiosity, and whether this varies across ethnic groups. Finally, this chapter will test whether aspiration outcomes are affected by the average religiosity of classmates in the school cohort. This study will contribute to the field by focusing on under-investigated, but potentially salient, differences in religious attitudes and behaviours of students across ethnic groups in order to better understand the role played by individual level and school cohort level religiosity in determining the likelihood of aspiring to university.

3.2 Previous research

There has been long standing interest in the American literature in associations between religion and education. This interest is primarily sited at the macro-level, with the majority of research investigating the effects of religiously affiliated schools, rather than of micro-level (student) religiosity, on a wide range of educational outcomes (e.g. GPA, standardised test scores, college enrolment, truancy, academic attainment, grade retention). There is limited research looking at the effects of religiosity on the likelihood of aspiring to university (although there is research looking at university enrolment), which is the research focus of this chapter. University aspirations in the context of ethnic differences in education in England are relevant for two reasons: 1) high aspirations are very important for academic progression and especially for making the transition to the tertiary stage of education; and 2) many ethnic minority groups report higher levels of educational aspiration than the majority White British ethnic group. As such, university aspirations are an important and relevant educational outcome where ethnic differences do appear to exist (as will be seen later in this chapter).

The research tradition is rooted in the differential performance of Protestant and Catholic students in America (Regnerus 2003). The historic under-performance of Catholic students was attributed to the authoritarianism and anti-intellectualism of Catholic society, alongside the dominance of the Protestant influence upon public school education (Lenski 1963). More recently, the performance of Catholic students has improved to the extent that research has begun to focus on the relative educational success of schools religiously affiliated with Catholicism (Catholic schools). Coleman and colleagues have lead the research into Catholic school advantages, showing that the average educational achievement of students attending Catholic schools is above that of students at state-funded public schools (Coleman and Hoffer 1987; Coleman, Hoffer et al. 1982). Other researchers have opposed the findings of Coleman and others, arguing that there are no educational advantages to attending a Catholic school (Noell 1982; Willms 1985). Nevertheless, research in this area has continued to grow and to look more broadly at religiously affiliated school effects (e.g. Bryk, Lee et al. 1993; Chubb and Moe 1990).

The mechanisms behind any advantages associated with religious schools have been difficult to disentangle. Some authors suggest that students at religious schools gain access to more religious social capital (Parcel and Dufur 2001b). Others have argued that school policies and student behaviour drive the Catholic school advantage (Coleman and Hoffer 1987; Coleman et al. 1982). The analyses presented in this chapter will investigate whether there is an educational advantage associated with attending a religiously affiliated school, and whether this advantage persists after controlling for external sources of religious influence and student behaviour.

H1: Students who attend religiously affiliated schools are more likely to aspire to university than students who attend non-religiously affiliated schools.

As mentioned previously, the focus in the literature has been mostly on the macro-level direct effects of religiously affiliated schools on academic achievement, rather than the indirect effects of religious schools on academic achievement through micro-level student religiosity (Jeynes 2003b; McKendry-Smith and Sociology 2007). The intention of this thesis chapter is, however, to consider both macro-level effects of religious schools and micro-level effects of student religiosity on educational outcomes.

In terms of the micro-level literature, the majority of previous research suggests overall positive associations between individual religious belonging and youth outcomes (for a detailed review see Smith 2003). Therefore it seems logical to expect that students who have a religious affiliation will have better educational outcomes than students without a religious affiliation.

H2: Students who report a religious affiliation are more likely to aspire to university than students who report no religious affiliation.

With regards to religion and "racial" differences in achievement, a recent research synthesis by Jeynes (2010) on religiosity, religious schools, and the Black-White achievement gap suggested that having a religious faith (belief and religious obedience) consistently reduced the achievement gap (alongside belonging to an intact family). Jeynes carried out three meta-analyses, the results of which indicated that religious commitment reduced the achievement gap by 50%, whilst attending a religiously affiliated school reduced the achievement gap by 25%. These are quite large reductions in the achievement gap, leading Jeynes to argue that religiosity and religious schools have a key role to play in reducing the Black-White achievement gap.

Other literature also suggests that ethnic minority students who are more religious academically out-perform their less religious peers (Jeynes 2003b; Jeynes 1999).

Walker and Dixon (2002) found that African American students who reported increased religious behaviours and spiritual beliefs achieved higher cumulative GPAs. This supports Steward and Jo's (1998) earlier findings of effects of religiosity on achievement for African Americans. However, Oh's analysis of the effect of religiosity on academic achievement was significant for Hispanic students only, not African Americans (Oh 1999; cited in Park 2001). Other evidence exists to further suggest that religiosity may be negatively connected to academic outcomes for some ethnic and religious groups. For example, some authors argue that strong commitments to Eastern religions may negatively impact upon degree attainment (Lee, Puig et al. 2007), whilst others suggest that some fundamentalist religious organisations are in opposition to non-religious academic attainment (Darnell and Sherkat 1997; Sherkat and Darnell 1999). However, in their study on Vietnamese teenagers, Bankston and Zhou (1996) found that church attendance was related to increased average grades, greater perceived importance of going to college, and lower likelihood of substance abuse. This finding is contradictory to the arguments of Lee and colleagues.

Despite the mixed findings for the associations between religiosity and education for ethnic groups, there does seem to be evidence that, in general, there is some sort of association between religiosity and education in addition to that between ethnicity and education. The direction of this association, however, is not clear. In the UK, because of the sizeable correlation between ethnic groups and religious affiliations[23], it is nevertheless possible that part of the differential educational performance attributed to

[23] For example, there is a very high correlation between Pakistani ethnic origin and Muslim identification. In a similar way, a large majority of the Indian ethnic group belongs to the Hindu and Sikh faiths. There are also distinctions within the Christian faith, with a sizeable proportion of Eastern European (White Other ethnic group) individuals belonging to the Roman Catholic religion, whilst many Evangelical church members have ethnic origins in the African continent and the Caribbean.

ethnic origin may be explained by religious group affiliation and corresponding differences in religious behaviours.

H3: Controlling for religious affiliation in the model will reduce the size and significance of ethnic group coefficients before religiosity measures are included.

Thinking more about theory, Jeynes (2003a) neatly summarises three explanations for how religion may influence youth educational (and other) outcomes. Jeynes' first reason is that religious students may have a stronger work ethic instilled through their religion and religiosity. As such, religion may affect education through an increase in individual work effort and amount of work carried out. Since Weber's original arguments for what is now known as the "Protestant work ethic" (Weber 1904; 2003), there has been much research suggesting that religion is associated with increased work ethic (e.g. Mentzer 1988; Arruñada 2010). For example, McCullough and Willoughby (2009) find that private religious behaviours, such as prayer and the study of scripture, improves young people's self-regulation, self-discipline, and work ethic. The broader review by Koole and colleagues confirms that religious behaviours improve individual self-regulation and enable individuals to persist in less enjoyable situations (Koole, McCullough et al. 2010). Busto (1996) notes that the religious work ethic is also present in ethnic minority groups. This thesis chapter will investigate whether the effects of religiosity are mediated through increased work ethic (reported school work effort, controlling for parental encouragement for hard work at school).

Jeynes' second reason is that religious individuals are more likely to possess an internal locus of control (e.g. Jackson and Coursey 1988; Shrauger and Silverman 1971). An

internal locus of control reflects a belief within individuals that they can control and influence their own lives (Rotter 1966)[24]. Such beliefs may manifest in students' educational motivation and ability to cope with stress and difficulties. There is evidence of increased prevalence of coping strategies and a reduction of stress in more religious students (e.g. Sherkat and Ellison 1999; Strawbridge, Shema et al. 1998). Davis and Epkins (2009) found that private religious practices (such as prayer or scripture reading) amongst children weakened the association between family conflict and depression. Religious ethnic minority students have also been shown to be more resilient, which in turn contributes positively to academic achievement (Thompson and Gurney 2003).

Some authors have argued that religious students have more positive attitudes towards school, learning, and academic achievement (Francis 1992; Flynn 1993), which suggests that religious students may care more about education. In a study looking at African American urban youth, Sanders (1998) found that children's involvement in church was positively associated with academic achievement. This positive association was net of the academic support provided by parents, indicating that religious involvement contributes to academic success over and above the contribution of the family. Sanders suggested that religious involvement boosted the children's academic self-concepts and promoted behaviours that were useful for schooling outcomes. Others have suggested that religiosity increases psychological well-being (Wright, Frost et al. 1993), which may in turn increase internal locus of control.

[24] Internal locus of control is contrasted to external locus of control, whereby individuals believe they have limited control over their future and so adopt a more passive attitude, leaving outcomes to fate or chance. External locus of control is also known as "God control". Research on religious African Americans suggests that internal locus of control and external locus of control are not mutually exclusive and can be highly correlated (Jackson and Coursey 1988). Further research suggests ethnic differences in religious fatalism (passivity) (Jacobson 1999), which in turn may impact on motivation.

Alongside evidence suggesting that religious individuals are more likely to possess an internal locus of control, there are findings showing consistent positive associations between internal locus of control and academic achievement across the primary, secondary, and tertiary education levels (Kalechstein and Nowicki 1997; Findlay and Cooper 1983; cited in Youse 2012). Muller and Ellison's (2001) findings suggested that religiosity (measured as self-identification as a religious person, place of worship attendance, and participation in religious activities) was associated with maintaining an internal locus of control. The association between internal locus of control and achievement appears to also exist for non-White ethnic minority students (e.g. Maqsud 1983). However, Lee and colleagues used longitudinal data to show that students' religiosity at high school was associated with the likelihood of attaining a university degree net of the effect of internal locus of control (Lee et al. 2007), suggesting residual effects of religiosity. This thesis chapter will test whether the effects of individual level religiosity are mediated through a measure of student's locus of control (created from a scale that combines student's self-assurance of doing well at school, student's self-assurance of getting good grades at school, and the importance of school grades to student).

Jeynes' third reason is that religious students may be less likely to get involved in behaviours that might be harmful to education than non-religious students. There is empirical evidence that religious teenagers are less likely to take part in educationally harmful behaviours such as drinking (e.g. Brown, Parks et al. 2001), drug abuse (e.g. Brownfield and Sorenson 1991), health-compromising behaviours (e.g. Wallace Jnr. and Williams 1999), truancy (e.g. Sinha, Cnaan et al. 2007) and other negative behaviours in school (e.g. Freeman 1986).

Religious students may be better able to avoid harmful behaviour by choosing friends and social ties who also try to avoid harmful behaviour. These ties serve to reinforce the norms of the religious group and to provide support and create shared expectations (Greeley 1997). Parents may be able to influence their children's friendship choices by involving their children in the religious community e.g. sending their child to a faith school; enrolling their child in extra-curricular religious classes; taking their child to their local place of worship. Religious schools and organisations facilitate the creation of youth social groups that conform to the desires of the religious community, and avoid anti-social or risk-taking activities (Muller and Ellison 2001). By involving their child in religion in this way, the student increases their chances of making friends with other religious students, who may also be more conventional and less likely to participate in risk-behaviours (Muller and Ellison 2001).

In their 2001 study using AddHealth data, Muller and Ellison found that this was indeed the case. The values of friends were found to positively promote the student's own educational aspirations, increase the time they spent on their own homework, encourage regular attendance class, and push them to take more advanced school courses in maths (Muller and Ellison 2001). The authors concluded that religious social capital had a positive effect on educational achievement through its role in shaping adolescent social networks and encouraging friendships between young people with high educational values. Erikson and Phillips' (2012) research also argues that adolescent participation in religion reduces deviant behaviour because it provides social control, a traditional socialisation environment, and improved access to social support. These three factors have been previously identified as explanations for the positive effects of religiosity (Regnerus 2000; Regnerus 2003).

The friends, networks, and religious communities of religious students may even reinforce positive behaviours and provide access to educationally beneficial resources. For example, research shows that young people can gain assets and information through the access religious participation gives to religious social networks (Glanville, Sikkink et al. 2008). With regards to ethnic minority students, access to this extra ethnic or religious capital is thought to often, at least partially, compensate for the restricted information and resources available from mainstream society. Religious institutions may be able to compensate for a lack of social closure or family-based social capital by promoting certain social norms and behaviours and by providing channels of information flow that result in school success. Parental religious participation has also been shown to have an independent positive effect on the chances of their children graduating from high-school net of other religious and socio-demographic factors; this parental religiosity[25] effect provided an additional extra bonus for children who also participated in religion themselves (Stokes 2008).

It seems then that religiosity may have an effect on educational outcomes through the influence it has on the avoidance of educationally harmful behaviour and the selection of conformist friends. This thesis chapter will investigate whether individual level effects of religiosity are mediated through reductions in the student's participation in educationally harmful behaviour (bad behaviour at school).

Considering Jeynes' three reasons together, alongside the empirical evidence presented, it is reasonable to expect that increases in individual level religiosity (measured in a scale by combining student reports of importance of religion to self, frequency of

[25] Due to a lack of data, parental religiosity will not be considered in this thesis chapter.

prayer, and frequency of visits to places of worship) will be associated with increased educational outcomes.

H4: Students who report higher levels of religiosity are more likely to aspire to university than students who report lower levels of religiosity.

It is plausible that there are contextual effects of student religiosity within schools i.e. that aggregates of more religious students provide educational benefits in additional to those accrued through individual level religiosity. Stark (1996) puts forward the argument that individual religiosity may have greater effects upon individuals who belong to communities of similarly religious others, suggesting that such contexts allow the reinforcement of shared norms and the improved ability to sanction deviants. Based on the assumption that students who are more religious are also more conformist, this chapter's analysis includes measures of school cohort level religiosity to see whether there are additional effects of religiosity mediated through students belonging to more religious social contexts. It seems reasonable to expect that religious social contexts may also influence educational outcomes.

H5: Students who belong to school cohorts with higher average levels of religiosity are more likely to aspire to university than students who belong to school cohorts with lower average levels of religiosity.

Finally, it is possible that the effects of religiosity vary significantly across ethnic groups, with those groups that are more likely to aspire to university perhaps doing so because of their typically higher levels of religiosity.

H6: There will be significant variations in the individual level effects of religiosity across ethnic groups.

3.3 Relevance of university aspirations

There is a large body of evidence from the UK and beyond suggesting that young people from different ethnic and national origins follow different educational pathways and have different aspirations for academic attainment (e.g. Feliciano 2006; Portes and Rumbaut 2001; Rumbaut and Portes 2001; Strand and Winston 2008; Shah, Dwyer et al. 2010). Educational aspirations are relevant because they are a major predictor of educational attainment, which in turn influences later life economic outcomes (Sewell, Haller et al. 1970; Sewell et al. 1969; Duncan, Featherman et al. 1972; Haller and Portes 1973). Feliciano distinguishes between aspirations and expectations, noting that:

> *"[e]ducational aspirations may capture general goals or ambitions for the future, whereas expectations more explicitly capture realistic plans for the future…educational expectations involve concrete goals and are thus more likely to correspond to eventual attainment"* (Feliciano 2006: 285).

The terminology of the CILS4EU survey refers to "idealistic" [26] and "realistic" [27] aspirations, which respectively correspond to Feliciano's distinction between aspirations and expectations. As expectations are thought to be more likely to be associated with subsequent attainment, this research chapter will focus on educational expectations i.e. *realistic* educational aspirations.

In terms of the literature, it seems that ethnic minority students from most groups typically have higher educational aspirations than their ethnic majority peers, and maintain these aspirations net of socioeconomic background and academic ability (e.g. Kao and Tienda 1998; Modood, Berthoud et al. 1997; Connor, Tyers et al. 2004).

[26] Idealistic aspirations are those that are "wishful" or "optimistic" and not necessarily based on real-world constraints or possibilities.
[27] Realistic aspirations are those that are "reasonable" or "rational", and should be based on real-world constraints and possibilities.

Therefore university aspirations are a relevant outcome to consider in this thesis because there are clear ethnic differences in aspirations, and aspirations have been found to have an effect on subsequent educational attainment.

3.4 Contribution to the field

This research contributes to the field in three principal ways. Firstly, this study combines a range of religiosity measures – self-reported importance of religion, frequency of prayer, and frequency of visits to places of worship - simultaneously in a scale to better incorporate the variety of dimensions of religious attitudes and behaviours. This range of measures is greater than those used in most of the papers in the field, and are analysed in addition to the typically used measure of school religious affiliation. Secondly, this study looks at multiple ethnic and religious groups, rather than just Catholic achievement compared to Protestant achievement. Thirdly, this study focuses on university aspirations, which are arguably highly relevant in the UK context, where educational attainment is very important for academic progression, and where some ethnic minority groups report higher aspirations than the majority group. The focus on realistic aspirations rather than idealistic aspirations is also relatively rare, but arguably better captures students' progression outcomes and chances of receiving a university degree than do idealistic aspirations. Fourthly, this study exploits a large, nationally representative, contemporary, unreleased dataset. The data allows the comprehensive analysis of mediating pathways through which religiosity may impact on education, thereby better allowing both direct and indirect effects of religiosity, net of controls, to be identified. Finally, this study considers the contextual effects of religiosity at the school cohort level in order to see whether there are effects of school community religiosity over and above those at the individual level.

3.5 Data and methods

The data for this study comes from the English portion of wave 1 of the Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU). This comprises initial wave 1 data from 4,315[28] fifteen year old students attending 107 schools in England. The wave 1 data was collected between autumn 2010 and spring 2011, when students were all in Year 10 (aged 14 to 15).

All data and variables used in this analysis come from the survey implemented in schools in England in wave 1. The school sample was chosen using a stratified random sampling method, with stratification taking place according to the ethnic density of schools[29]. Two mixed ability classes were interviewed in most schools with a mean of 40.1 students interviewed per school[30]. Students completed an individual questionnaire, an in-class social networks module, a survey about their 5 best friends, a non-verbal reasoning cognitive ability test, and an English language test.

As the data were sampled in two stages (first schools, then school classes), a multilevel modelling strategy is most appropriate for the analysis of this data. This is because such a strategy better accounts for the clustered nature of observations. Multilevel modelling techniques are more able to partition variance across the different levels of analysis, which helps avoid the under-estimation of standard errors. The dependent variable (aspiring to university) is binary so multilevel binary logistic regression models were estimated on the data using the *xtmelogit* command in STATA 12. Weighted descriptive

[28] The original sample contained 4,427 cases but 112 of these cases were absent from school when the survey was administered and so were excluded from the sample.
[29] Stratum 1 included schools with 0-10% of the student population being of ethnic minority origin; stratum 2 included schools with 10-30% ethnic minority students; stratum 3 included schools with 30-60% ethnic minority students; stratum 4 included schools with 60-100% ethnic minority students.
[30] Standard deviation of number of pupils interviewed in schools is 9.17(2.d.p.). The maximum number of students interviewed in a school was 60; the minimum number was 12.

statistics of all variables used in the analyses can be seen in Table 27 and Table 28 in the Appendices.

3.5.1 Dependent variable

The dependent variable in this analysis is having a realistic aspiration of attaining a university degree. Students were asked the question "What is the highest level of education you think you will actually get?" Response options were "no qualifications", "GCSEs or similar", "A levels or AS levels or similar", "university degree", and "don't know". These responses were dichotomised so that the response of "university degree" was coded as 1 and all other responses were coded as 0. There were 47 cases where the information for this variable was missing; these (relatively few) cases were excluded.

3.5.2 Independent variables

The independent variables in the analysis included in all models were standard socio-demographic controls for student's gender; highest parental completed educational qualification; household structure (two parents, single mother, single father, other adult); independent school attendance; and ethnic origin.

Highest completed educational qualifications were coded as none/not known/missing, primary (or equivalent), secondary (or equivalent), and tertiary (or equivalent). This was the same for both mothers and fathers. A combined measure was created to indicate the highest educational qualification achieved by either parent e.g. if father had completed secondary education and mother tertiary education, then highest parental education would be coded as tertiary.

The independent school indicator was included in all models because it was expected that independent schools put a greater emphasis on attending university, and because students attending independent schools have selected into that type of school i.e. they

are not randomly allocated. In the same way, a dummy variable to indicate whether or not the school was affiliated to a religion was also included in all models to test for additional effects of individual religiosity net of the effects of attending a religiously affiliated school[31].

Religious group affiliation indicators were derived from the wave 1 question "What is your religion?" The answers were recoded to the following religious group categories: No religion, Christianity, Islam, Other religion[32] and Missing religion (for the 287 cases where no information on religious affiliation was recorded).

Three additional control variables were used. The first variable is cognitive ability test score, which is taken from the non-verbal reasoning cognitive ability test administered to all students at the same time as the wave 1 survey. Cognitive ability test score was standardized across the whole sample and included in all models. The second variable is parental encouragement for their child to work hard at school. The student was asked "How strongly do you agree or disagree with the following statement: "My parents encourage me to work hard for school". Responses were dichotomised so that "strongly agree" responses take 1 and all other responses ("agree", "neither agree nor disagree", "disagree" and "strongly disagree") take 0. The third variable is a depression-anxiety measure. This measure is created by taking the mean response by students to four questions about the frequency to which they could answer true to the following statements: "I feel very worried"; "I feel anxious"; "I feel depressed"; "I feel worthless" (alpha = 0.81). Response options were "often true", "sometimes true", "rarely true", and

[31] Religious affiliations of schools were derived from the EduBase database of schools in the UK.
[32] Other religion includes Buddhism, Hinduism, Judaism, Sikhism and cases where the student chose "Other religion".

"never true". Responses were reverse-coded and the mean taken of the four items to create a continuous measure of depression and anxiety. This measure was standardised for inclusion in the analysis.

In additional to the control variables, there are three mediation variables used in the analyses. These variables are included following Jeynes' speculation that effects of religiosity on education may operate through certain pathways. The first mediation variable is the bad behaviour at school scale. This was created from four items measuring school behaviour. Students were asked how often they "argue with teacher", "get a punishment from school", "skip a lesson without permission", and "come late to school" (alpha = 0.73). The response categories for each question were "every day", "once or several times a week", "once or several times a month", "less often", and "never". Responses were reverse-coded, the mean taken, and the resulting variable standardised.

A second mediation variable is that capturing internal locus of control. The locus of control scale for education was created from three values to do with school outcomes. Students were asked how much they agreed or disagreed to the statements "I am sure I can do well at school", "I am sure I can get good grades at school", and "It is very important to me to get good grades at school" (alpha = 0.71). Similar measures were included by Nowicki and Strickland in their paper *"A locus of control scale for children*" (Nowicki and Strickland 1973). Response options were "strongly agree", "agree", "neither agree nor disagree", "disagree", and "strongly disagree". These were reverse-coded, the mean taken, and the resulting variable standardised.

A third mediation variable measures student work ethic. The student's motivation was captured by the item "How strongly do you agree or disagree with the following

statement: "I put a great deal of effort into my schoolwork". Responses were dichotomised in the same way as the parental encouragement variable; in other words, "strongly agree" responses were coded as 1 and all other responses were coded as 0. Student work ethic was included in the model in addition to parental encouragement for the student's hard work at school. These measures are likely correlated in some cases, but it is plausible that there are also cases where students have high work ethic despite low encouragement from parents, and vice versa. As such, it is justified to include both measures as they are not highly correlated in all cases (r = 0.26 across the sample).

3.5.3 Ethnic background categorisation

Ethnic background was constructed using a three stage process. Firstly, students born abroad were allocated to ethnic origin groups based on their region of birth. Secondly, the remaining students born in the UK were allocated based on the region of birth of their parents. If either parent was born abroad, the student was allocated to the corresponding non-White British ethnic origin group. Where there were differences in the regions when both the mother and the father were born abroad, then the student was allocated to the mother's region. Thirdly, the students born in the UK were allocated to ethnic origin groups using their response to an ethnic belonging question[33]. Students with ethnic groupings that were missing after the three stage process were placed in the "No group/missing" ethnic background category. Students who reported being born in Britain, reported both parents as also being born in Britain, and reported that they

[33] Students were asked which group(s) they felt they belonged to and presented with a list of ethnic categories and an "other" category where they could record an open response. This question was not used as the main determinant of ethnic origin due to greater difficulties in interpreting student's responses compared to the clearer measures of country of birth and parents' countries of birth.

belonged to "no other group" for the question on ethnic belonging were classified into the White British group.

Ethnic groups with small numbers were combined into one group in order to ensure ethnic categories had sufficient sample numbers for analysis purposes. Unfortunately, this combining of categories resulted in the loss of a lot of detail concerning ethnic background and origin. This resulted in seven broad ethnic background groups and one "no group/missing" category. The ethnic categories were: White British, White Other, Indian, Pakistani, African, Caribbean, Other ethnicity, and No group/Missing. The White British group was chosen as the reference category because of its large size and because the ethnic majority group is typically used as a reference group in ethnicity research. Strength of ethnic identity was not included in the analysis due to limited response to this question.

3.5.4 Key predictor variables - individual religiosity and school cohort average religiosity

Three measures of individual religiosity were combined into a religiosity scale for the analysis that follows. Firstly, students were asked "How important is religion to you?" Response options were "very important", "quite important", "not very important", and "not at all important". These were reversed coded so that "not at all important" scored 1 and "very important" scored 4. Secondly, students were asked "How often do you pray?" Response options were the following six categories: "never", "occasionally but less than once a month", "at least once a month or less", "at least once a week", "one to four times a day" and "five times a day or more". Responses were assigned numerical values so that "never" scored 1 and "five times a day or more" scored 6. Thirdly, students were asked "How often do you visit a religious meeting place?" Responses options were the same as for frequency of prayer and so were scored in the same way.

The religiosity scale was created by summing together the three dimensions of religiosity captured here and dividing by three. It is a very reliable scale with an alpha of 0.88. The minimum scale value was 1; the maximum was 5; the mean was 2.25. The item was standardised in the analysis. Importantly, all students were asked these questions i.e. students who reported "no religion" were not filtered out of these questions, ensuring that they were also able to report their behaviours to these questions regardless of religious affiliation.

In order to test for contextual effects of religiosity, the individual scores on the religiosity scale were aggregated by school cohort to create an average school cohort religiosity measure. The measure was standardised to allow comparisons of effects across the measures.

Three other school cohort level contextual measures were also included in the final two models. These were the proportion of non-White British students in the school cohort; the proportion of students who reported a religious affiliation in the school cohort; and the proportion of students with at least one degree-educated parent in the school cohort. All three of these measures were created by first making dummy indicators to show whether students were of an ethnic minority background, whether students had a religious affiliation, and whether students had at least one parent with a university qualification. These dummies were then aggregated to the school cohort level to create proportion variables ranging from 0 to 1. These were also standardised to aid comparison of effects.

3.5.5 Sample

Cases were excluded from the analysis if they were lacking information on any of the independent variables of interest or on the main dependent variable. This reduced the

dataset from 4,315 cases to 3,556 cases for the final analysis. Students from all 107 schools were retained for the final analysis.

The method to exclude cases was as follows. Forty seven cases were excluded because of missing information on the dependent variable (realistic university aspirations). Students missing information on cognitive ability test score (128 cases) were excluded. Ethnic group was considered to be a very important variable for the research and so, in order to maximise the sample size, the 253 cases missing information on ethnic group were classified into a separate category of "Missing ethnicity". In this way, they could be retained in the sample.

For the same reasons, information on parental education was deemed vital because of the strong links between parental education and occupational social class levels and child educational outcomes (Blau and Duncan 1967; Featherman and Hauser 1978) and so missing information in this category was stored in a separate "unknown" category in order to keep these cases in the analyses. In order to maximise the use of the available information, and minimise the use of "unknown" categories, a variable combining mother's highest education with father's highest education to create a "highest parental education" measure was used in the analysis.

In terms of the key religiosity scale measure, there were 341 cases dropped because of missing one or more of the dimensions of religiosity needed for the scale. This is a large number, but it was felt that imputing the key predictor variable would lead to unreliable estimates so excluding cases was the preferred method.

In terms of control variables, nine cases were removed from the analysis because they were missing information on gender. Seventy eight cases were excluded because household structure information was not available. Ninety eight cases were excluded

due to missing age information or reporting an age other than 14 or 15. Students missing information on parental encouragement were also excluded (25 cases). Forty four cases were dropped because of missing information on bad behaviour in school, whilst 163 cases were missing information on depression and anxiety. Forty five cases were missing information on effort put into school work. Sixty six cases were missing information needed to estimate internal locus of control of the student. There was no missing information on the school type.

Descriptive statistics and a correlation matrix for all variables used in the analyses for this chapter can be found in the Appendices in Table 27, Table 28, and Table 29.

The distribution of the final sample can be seen below. As can be seen in Table 6 the majority of the sample comes from the White British ethnic group, but there are sufficient case numbers to also investigate six other ethnic groups in addition to the "no ethnicity/missing" category.

Table 6 Distribution of sample by sex and ethnic group

Ethnic Group		Male	Female	Total
White British	N	1110	1082	2182
	%	76.0	78.3	77.1
White Other	N	118	97	215
	%	4.6	4.0	4.3
Indian	N	122	108	230
	%	3.5	2.9	3.2
Pakistani	N	139	116	255
	%	3.9	3.2	3.5
African	N	91	100	191
	%	2.9	3.1	3.0
Caribbean	N	47	73	120
	%	1.4	1.7	1.5
Other ethnicity	N	134	127	261
	%	5.6	4.1	4.8
No group/Missing	N	40	62	102
	%	2.2	2.7	2.4
Total	N	1791	1765	3556
	%	100.0	100.0	100.0

Note: Weighted percentages; unweighted Ns.

Table 7 shows that there are indeed large overlaps between ethnic group and religion for many groups. For example, 94.2% of the Pakistani sample identify as Muslims. Similarly, larger proportions of the African and Caribbean groups identify as Christians, whilst almost 70% of Indians belong to an "Other" religion (most likely these cases are Hindus or Sikhs). Nevertheless, there is enough variation across religious affiliations for most ethnic groups to justify an investigation into religiosity. Caution must be taken due to small case numbers in some cells.

Table 7 Distribution of sample by ethnic group and religious affiliation

Ethnic group / religion		No religion	Christian	Muslim	Other religion	Missing religion	Total
White British	N	1184	864	25	98	11	2182
	%	56.0	39.3	0.4	3.5	0.9	100
White Other	N	51	111	19	30	4	215
	%	30.0	52.3	6.6	10.0	1.2	100
Indian	N	20	11	32	162	5	230
	%	9.3	5.4	17.5	64.6	3.3	100
Pakistani	N	7	2	241	4	1	255
	%	6.6	0.8	89.5	1.4	1.7	100
African	N	16	115	44	15	1	191
	%	11.9	60.0	21.4	6.3	0.4	100
Caribbean	N	24	83	3	8	2	120
	%	26.3	60.5	2.0	6.2	5.0	100
Other ethnicity	N	70	66	71	50	4	261
	%	44.0	20.9	18.1	14.9	2.2	100
No group/Missing	N	30	46	21	5	0	102
	%	38.5	47.2	7.7	6.7	0.0	100
Total	N	1402	1298	456	372	28	3556
	%	48.8	37.7	6.0	6.4	1.1	100

Note: Weighted percentages; unweighted Ns.

Table 8 shows the proportion of students within each cell who reported a realistic aspiration of achieving a university degree. The generally lower aspirations of the White British group are notable here, alongside some cells of the Caribbean and No group/Missing ethnic categories. The Indian group reports the highest aspirations almost across the board, whilst the lower aspirations of Muslims (apart from those in the No group/Missing category and also the African group) is of interest. It seems that those who report no religion also have typically lower aspirations than students of the same ethnicity but who have a religious affiliation (apart from the Indian secular students, who maintain high aspirations).

Table 8 Proportion of students aspiring to university by ethnic group and religious affiliation

Ethnic group / religion	No religion	Christian	Muslim	Other religion	Missing religion	Total
White British	0.26	0.38	0.36	0.36	0.03	0.31
White Other	0.37	0.48	0.53	0.34	0.30	0.43
Indian	0.89	0.84	0.46	0.66	0.77	0.66
Pakistani	0.47	0.00	0.44	0.54	0.00	0.43
African	0.67	0.61	0.59	0.61	1.00	0.61
Caribbean	0.50	0.46	0.50	0.42	0.00	0.44
Other ethnicity	0.58	0.54	0.38	0.47	0.46	0.52
No group/Missing	0.37	0.76	0.62	0.09	.	0.56
Total	0.29	0.42	0.45	0.47	0.16	0.36

Note: Weighted proportions.

Religiosity levels also seem to vary across ethnic and religious groups (Table 9). As expected, those who report no religious affiliation score very lowly on the religiosity scale. Muslims across ethnic groups typically have the highest levels of religiosity, whilst non-White British and non-Pakistani Christians are also quite religious. There is a fair amount of variation within the Other religion and Missing religion columns; this is likely due to the number of different religions incorporated into the Other religion category, and the small case numbers in the Missing religion category.

Table 9 Average religiosity by ethnic group and religious affiliation

Ethnic group / religion	No religion	Christian	Muslim	Other religion	Missing religion	Total
White British	1.24	2.17	3.59	2.43	1.77	1.66
White Other	1.27	2.57	2.48	2.79	2.65	2.20
Indian	1.21	3.48	3.70	3.22	2.61	3.11
Pakistani	1.09	1.73	3.85	2.16	5.00	3.65
African	1.18	3.50	3.71	2.83	3.33	3.22
Caribbean	1.49	2.97	4.06	2.40	2.45	2.54
Other ethnicity	1.35	2.85	3.70	2.50	2.96	2.29
No group/Missing	1.23	2.39	3.67	3.02	-	2.09
Total	1.25	2.31	3.72	2.74	2.24	1.90

Note: Weighted statistics.

3.5.6 Selection issues

It is important to acknowledge the difficulties in making causal claims when looking at religiosity and academic outcomes. There is the problem of self-selection into religious attitudes and behaviours meaning that it could be that some unmeasured variable both contributes in a non-random way to academic success and to religiosity For example, students who are highly motivated by learning may have high aspirations but also may be more likely to select into extra-curricular religious classes because they perceive it as a learning opportunity. Similarly, there might be unmeasured characteristics of parents and families that both influence academic outcomes and the participation of their children in religious activities. An unfortunate omission in the analysis is a measure of the intergenerational transmission of religiosity i.e. measures of parental religiosity and the strength of the correlation between parental religiosity and child religiosity. It seems that without modelling the selection into religious groups and religious behaviours in the first place, it is difficult to make causal claims as the analysis may be subject to non-random selection issues.

Further, there are conceptual differences between the dimensions of religiosity investigated in the analysis. For example, self-reported importance of religion to self and prayer[34] behaviours may capture "private" aspects of religiosity, whilst visits to places of worship may capture more "public" or "social" aspects of religiosity. This distinction is again separate from the potential role of religious affiliation, or even of religion itself, which may determine norms and values in the first place. In practice, it is

[34] In some religions prayer is also a public event, with worshippers congregating together to pray at set times e.g. Christians attending church on a Sunday. In these situations, however, it is plausible that the act or process of prayer itself is still a private, individual act, even if it does take place in public. Therefore prayer can be argued to be both a private aspect of religiosity and a public aspect.

difficult to determine whether these aspects of religiosity are actually independent of each other as they are highly correlated and potentially endogenous to one another. This justifies the use of a religiosity scale, as a combined measure limits the risks of capturing random noise in the data.

The CILS4EU dataset is a data source where the influence of different aspects of religiosity can be combined into a scale. Further, there are measures available that can be used as indicators of parental involvement[35], meaning that the risks of omitted variable bias (with regards to parental characteristics that may influence both academic outcomes and children's religiosity) can be, to some extent, reduced in the analysis. However, self-selection issues are still present and a relevant concern.

3.6 Results

The results of the analysis are presented in Table 10. All models include controls for sex, highest parental completed education, family structure, independent school status, and ethnic group. There are 3654 students from 107 schools in all models. Full model tables can be seen in the Appendix.

Looking at the model 1 results for the likelihood of aspiring to university, it can be seen that there are some ethnic differences net of the control variables. Specifically, students from all ethnic groups are all significantly more likely to aspire to university than the White British reference group (although the size and level of significance of the effects vary by ethnic group). There is very limited support for H1 in model 1 only. In general

[35] Unfortunately, indicators of parental involvement specifically concerning religious behaviour, or concerning parental religiosity, are unavailable for this analysis. Parents were surveyed in the study and indicators of parental religiosity were captured, but low parental response rates to the mail-back survey mean that it is not possible to use these measures in the current analysis and still maintain a sufficient sample size.

it seems that students who attend religiously affiliated schools are not significantly more likely to aspire to university than students who attend non-religiously affiliated schools. Rather, increases in the likelihood of university aspiration come from attending independent (but not necessarily religiously affiliated) schools. Model 2 introduces controls for religious affiliation. The only significant difference is that between Christians and those who report no religious affiliation. This difference is positive, suggesting Christians are more likely to aspire to university than those with no religion. Therefore H2 is rejected as students who report any religious affiliation do not appear more likely to aspire to university than those who report no religious affiliation (the effect is only present for Christians). The religious affiliation result should be tempered as once individual religiosity is controlled for in model 3, any religious group effects seen in model 2 become insignificant.

With regards to the third hypothesis - controlling for religious affiliation in the model will reduce the size and significance of ethnic group coefficients before religiosity measures are included - Figure 7 shows that this is the case for almost all ethnic groups apart from the Indian group. Therefore H3 is not rejected and it does seem that religious group and ethnic group both contribute to explaining the likelihood of a university aspiration. More generally, the average marginal effects of ethnicity do reduce for all groups as additional explanatory variables are included in each successive model. However, some ethnic advantages do persist in the final model.

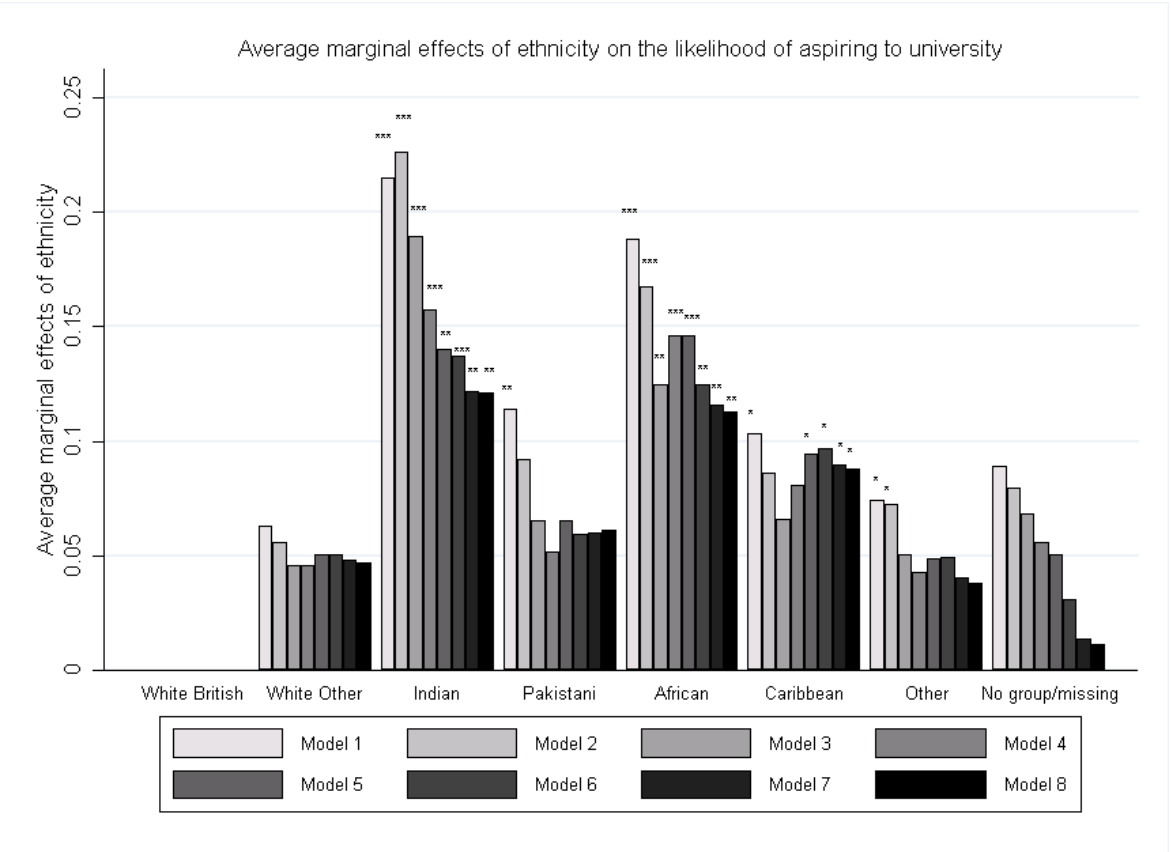


Figure 7 Average marginal effects of ethnicity on the likelihood of aspiring to university

Turning now to the key predictor variable in this thesis chapter, individual level religiosity is introduced in model 3. It is significantly and positively associated with university aspirations, leading to support for H4. The potential mediator variables identified by Jeynes are introduced in stages over models 4 to 6. Figure 8 shows how the average marginal effect of individual religiosity changes as these potential mediator variables, and additional controls, are included. It seems that once additional controls for cognitive ability and depression-anxiety are entered into the model, the average marginal effect of religiosity actually increases (model 4). But the inclusion of the bad behaviour at school measure in model 5 reduces the average marginal effect of religiosity, indicating that perhaps this is a potential mediating variable for the association between individual religiosity and university aspirations. The average

marginal effect of religiosity reduces further after internal locus of control and high effort into schoolwork are considered in model 6, suggesting these could also be mediating variables. The effect of religiosity remains significant throughout the models, and its largest effect size is still below 6%, meaning that the effect of religiosity itself is not that large at all e.g. when compared to the marginal effects of parental education or cognitive ability (not shown here).

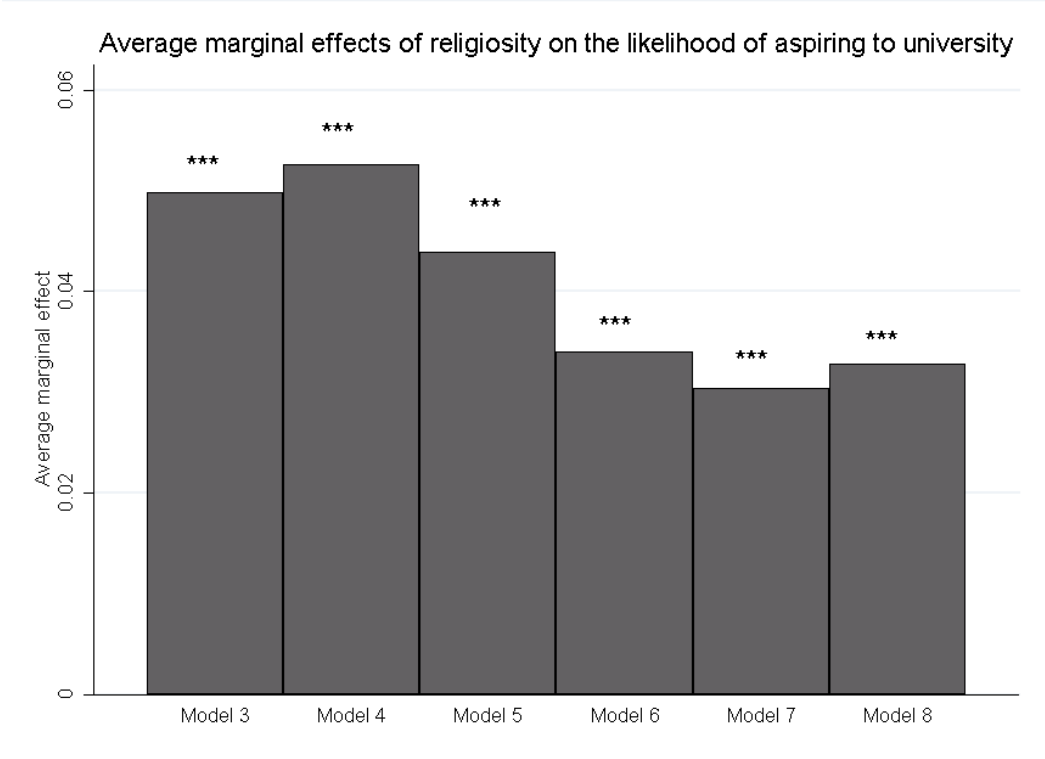


Figure 8 Average marginal effects of individual religiosity on the likelihood of aspiring to university

Table 10 Models predicting the likelihood of aspiring to university

	Model 1		Model 2		Model 3		Model 4	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
School ethnic density stratum (ref=0-10%)								
10-30% ethnic minority	0.24	(0.23)	0.22	(0.23)	0.21	(0.23)	0.13	(0.21)
30-60% ethnic minority	0.48*	(0.24)	0.46+	(0.24)	0.41+	(0.25)	0.34	(0.23)
60-100% ethnic minority	0.25	(0.26)	0.21	(0.26)	0.08	(0.26)	0.09	(0.25)
Independent school	1.39***	(0.32)	1.41***	(0.32)	1.39***	(0.32)	1.13***	(0.30)
Religiously affiliated school	0.27	(0.18)	0.21	(0.18)	0.14	(0.19)	0.13	(0.17)
Ethnic group (ref=White British)								
White Other	0.31+	(0.17)	0.28	(0.17)	0.23	(0.17)	0.24	(0.18)
Indian	1.01***	(0.19)	1.07***	(0.21)	0.90***	(0.22)	0.80***	(0.22)
Pakistani	0.55**	(0.18)	0.45+	(0.23)	0.32	(0.23)	0.27	(0.24)
African	0.89***	(0.18)	0.80***	(0.19)	0.60**	(0.19)	0.74***	(0.20)
Caribbean	0.50*	(0.22)	0.42+	(0.23)	0.33	(0.23)	0.42+	(0.23)
Other ethnicity	0.36*	(0.16)	0.35*	(0.17)	0.25	(0.17)	0.22	(0.17)
No ethnic group/Missing	0.43+	(0.24)	0.39	(0.24)	0.34	(0.25)	0.29	(0.25)
Religion (ref=No religion)								
Christian			0.32**	(0.10)	0.05	(0.11)	0.04	(0.12)
Muslim			0.27	(0.19)	-0.20	(0.21)	-0.12	(0.22)
Other religion (inc. Sikh)			0.05	(0.17)	-0.21	(0.18)	-0.18	(0.18)
Missing			-0.48	(0.50)	-0.71	(0.51)	-0.62	(0.53)
Religiosity scale					0.25***	(0.05)	0.28***	(0.05)
Cognitive ability (std.)							0.60***	(0.05)
Depression-anxiety scale							-0.19**	(0.06)
Constant	-2.19***	(0.28)	-2.28***	(0.28)	-2.55***	(0.29)	-2.20***	(0.31)
Level 2 variance	0.41***	(0.09)	0.41***	(0.09)	0.42***	(0.09)	0.34***	(0.08)
BIC	4265		4284		4269		4130	

	Model 5		Model 6		Model 7		Model 8	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
School ethnic density stratum (ref=0-10%)								
10-30% ethnic minority	0.15	(0.21)	0.12	(0.23)	-0.29	(0.19)	-0.30	(0.19)
30-60% ethnic minority	0.40+	(0.23)	0.40	(0.24)	-0.51+	(0.27)	-0.49+	(0.27)
60-100% ethnic minority	0.08	(0.25)	-0.02	(0.26)	-1.13**	(0.38)	-1.03**	(0.38)
Independent school	1.12***	(0.30)	1.32***	(0.32)	-0.12	(0.32)	-0.12	(0.32)
Religiously affiliated school	0.16	(0.17)	0.16	(0.18)	-0.16	(0.18)	-0.11	(0.18)
Ethnic group (ref=White British)								
White Other	0.27	(0.18)	0.29	(0.19)	0.29	(0.19)	0.28	(0.19)
Indian	0.73***	(0.22)	0.78***	(0.23)	0.73**	(0.23)	0.72**	(0.23)
Pakistani	0.35	(0.24)	0.34	(0.25)	0.36	(0.25)	0.37	(0.25)
African	0.76***	(0.20)	0.71***	(0.22)	0.69**	(0.21)	0.67**	(0.21)
Caribbean	0.50*	(0.24)	0.56*	(0.25)	0.54*	(0.24)	0.53*	(0.24)
Other ethnicity	0.26	(0.17)	0.29	(0.18)	0.25	(0.18)	0.23	(0.18)
No ethnic group/Missing	0.27	(0.25)	0.18	(0.27)	0.08	(0.27)	0.07	(0.27)
Religion (ref=No religion)								
Christian	0.01	(0.12)	-0.01	(0.12)	-0.03	(0.12)	-0.05	(0.12)
Muslim	-0.18	(0.22)	-0.18	(0.23)	-0.20	(0.23)	-0.20	(0.23)
Other religion (inc. Sikh)	-0.19	(0.18)	-0.20	(0.19)	-0.26	(0.19)	-0.27	(0.19)
Missing	-0.70	(0.54)	-0.62	(0.57)	-0.63	(0.57)	-0.64	(0.57)
Religiosity scale	0.24***	(0.05)	0.20***	(0.06)	0.19***	(0.06)	0.20***	(0.06)
Cognitive ability (std.)	0.56***	(0.05)	0.52***	(0.05)	0.50***	(0.05)	0.50***	(0.05)
Depression-anxiety scale	-0.12+	(0.06)	-0.06	(0.06)	-0.07	(0.06)	-0.06	(0.06)
Parental encouragement for hard work at school	0.55***	(0.09)	0.03	(0.10)	0.03	(0.10)	0.03	(0.10)
Bad behaviour at school scale	-0.28***	(0.06)	-0.02	(0.07)	-0.02	(0.06)	-0.02	(0.06)
Internal locus of control scale			1.58***	(0.11)	1.57***	(0.11)	1.57***	(0.11)
High effort into school work			0.30**	(0.11)	0.31**	(0.11)	0.31**	(0.11)
Prop. of non-White British students (std.)					0.32*	(0.14)	0.43**	(0.16)
Prop. of religiously affiliated students (std.)					0.11	(0.11)	0.24+	(0.13)
Prop. of students with a degree-educated parent (std.)					0.51***	(0.08)	0.52***	(0.08)
Cohort average religiosity (std.)							-0.29	(0.18)
Constant	-2.01***	(0.34)	-9.29***	(0.63)	-8.37***	(0.63)	-8.44***	(0.63)
Level 2 variance	0.33***	(0.08)	0.38***	(0.09)	0.16***	(0.05)	0.15***	(0.05)
BIC	4076		3827		3802		3808	

*Notes: Logit coefficients. Significance stars: + p<0.1, * p<0.05, ** p<0.01, ***p<0.001. All models include controls for sex, age, highest parental educational and family structure.*

The investigation into contextual effects at the cohort level begins in model 7. Here, three contextual aggregate measures are introduced (proportion of non-White British students; proportion of religiously affiliated students; proportion of students with a degree-educated parent). Of these three, both the proportion of non-White British students and the proportion of students with a degree-educated parent have the expected positive and significant effect. Interestingly, the inclusion of these contextual measures renders the coefficient for attending a school from the most ethnically dense stratum significant and negative. This effect exists net of the control for the proportion of students with a degree-educated parent in the cohort, which suggests that aspirations in the most ethnically dense schools may be lower because of something other than parental human capital. Given the expected high correlation between school ethnic minority density and school poverty, one potential factor that accounts for the negative coefficient of stratum four schools is a contextual effect of poverty on aspirations, akin to that identified in chapter 2. This explanation makes sense as the outcome of interest is realistic aspirations, which should be affected by economic constraints (unlike idealistic aspirations).

The inclusion of these three contextual measures reduces the BIC statistic to its lowest value across all models, suggesting that model 7 is the best fitting models out of those estimated here. The between-school (level 2) variance also decreases upon the inclusion of these contextual variables, from 0.38 in model 6 to 0.16 in model 7.

Cohort level average religiosity is introduced in model 8 and has a (non-significant) effect opposite to that hypothesised. H5 predicted that students who belong to school cohorts with higher average levels of religiosity would be more likely to aspire to university than students who belong to school cohorts with lower average levels of religiosity. In model 8 it can be seen that actually those students who belong to more

religious cohorts experience a negative association between cohort religiosity and likelihood of aspiring to university, although this effect is not significant.

The final hypothesis, H6, is that there will be significant variations in the individual level effects of religiosity across ethnic groups. The coefficients for interaction effects between ethnicity and individual religiosity can be seen in model 9 in Table 30 in the Appendices. There are no significant interaction coefficients, meaning that H6 is rejected and there are no significant variations in the effects of religiosity on university aspirations across ethnic groups. There are, however, some interesting patterns in the associations between university aspirations, religiosity, and ethnic group, as can be seen in Figure 9. Apart from the Indian and White Other group, all other ethnic groups show positive associations between religiosity and the likelihood of aspiring to university, suggesting that individual religiosity could possibly contribute to educational outcomes in a positive way.

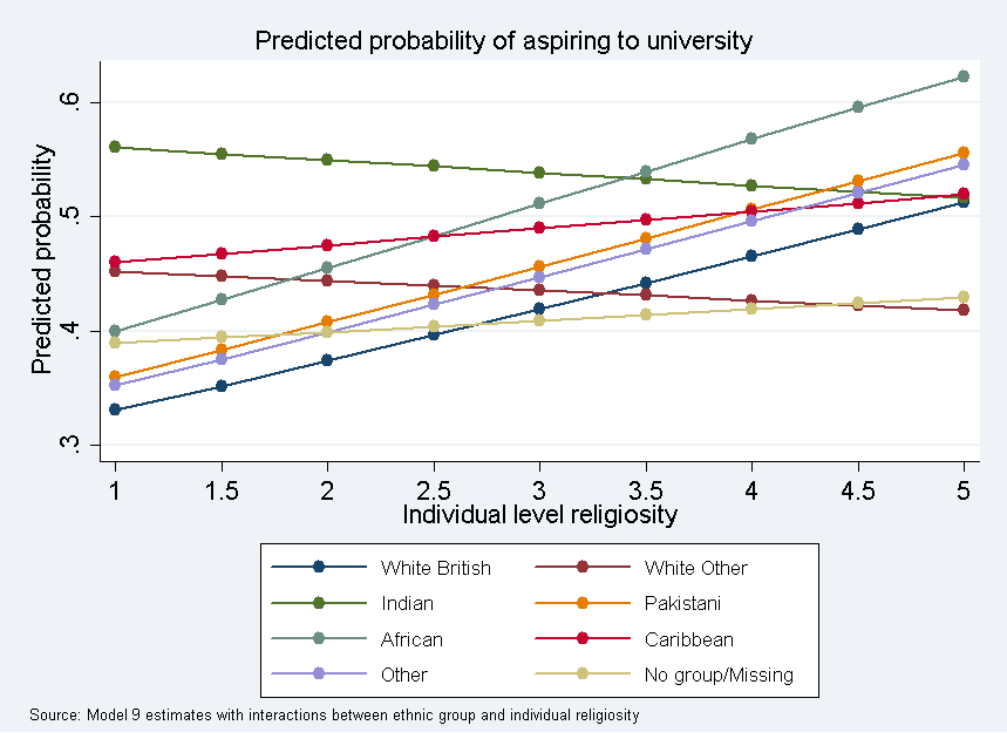


Figure 9 Predicted probability of aspiring to university by ethnic group and religiosity

3.7 Conclusion

This research chapter investigated associations between the likelihood of aspiring to university and individual level and school cohort level religiosity. Religiosity was operationalised in scale that combined three dimensions of religious attitudes and behaviours – importance of religion to self, frequency of prayer, and frequency of visits to places of worship. Individual religiosity scores were aggregated to the school cohort level to create an average religiosity in the cohort measure. Analyses were carried out to see how individual level and school cohort level religiosity were associated with the likelihood of aspiring to university.

The theoretical framework proposed by Jeynes (2003a), alongside most of the literature presented in the literature review, provided reasons to suppose that religious affiliation, individual religiosity, and attending a religiously affiliated school would all be associated with better educational outcomes. The empirical evidence for these suppositions is mixed. There is no evidence that attending a religiously affiliated school is associated with an increase in the likelihood of students aspiring to university. There is some evidence that reporting a religious affiliation (specifically a Christian affiliation) is educationally advantageous compared to reporting belonging to no religion. However, a caveat must be applied swiftly to this result, as it seems that the advantages associated with belonging to a religion are driven to a large extent by individual religiosity. This is the key result of this chapter – individual level religiosity does seem to be associated with an increased likelihood of aspiring to university. Thus religious affiliation alone is not sufficient to improve educational outcomes. Instead, religious attitudes and behaviours need to be actively adopted in order to increase university aspirations.

In terms of explaining ethnic differences in aspirations, the results showed that the effects of ethnicity did reduce after controlling for individual religiosity, although in some cases ethnic effects remained significant (for the Indian and African groups). In all cases, the effects of ethnicity were reduced after additional variables were included in the models, suggesting that ethnic differences in aspirations can be explained by factors beyond socioeconomic background.

The effects of religiosity persisted but were reduced in size after the inclusion of controls for Jeynes' potential mediating variables i.e. internal locus of control, work ethic, and avoidance of educationally harmful behaviour. As such, there does appear to be some evidence to support the idea that at least some of the effects of religiosity on educational outcomes operate through the mechanisms proposed by Jeynes (2003a).

In terms of contextual effects of religiosity, counter to expectations, there are no significant effects of this. Focussing on the (as expected) positive result of individual religiosity seen in this chapter, why might religiosity be associated with an increased likelihood of aspiring to university? The reasons behind these associations are difficult to pin-point, but could operate through the factors identified by Smith, whose 2003 article provides some explanations as to how effects of religious participation on positive youth outcomes may manifest. In this article, Smith suggests "nine key factors (moral directives, spiritual experiences, role models, community and leadership skills, coping skills, cultural capital, social capital, network closure, and extra–community links) that cluster around three key dimensions of influence (moral order, learned competencies, and social and organizational ties)" (Smith 2003: 17). These key factors are used to explain how religion and religiosity have positive influences on the

outcomes of American young people. The key factors can be mapped on to the empirical measures of religiosity used in this thesis chapter as shown in Table 11[36].

Table 11 Empirical measures of Smith's key factors

	Importance of religion to self	Prayer	Visit place of worship
Moral directives	✓	✓	✓
Spiritual experiences		✓	✓
Role models			✓
Community and leadership skills			✓
Coping skills	✓	✓	✓
Cultural capital			✓
Social capital			✓
Network closure			✓
Extra-community links			✓

Looking at the overlaps in the table, it could be that religious attitudes and behaviours provide students with moral directives, spiritual experiences, and coping skills. Moral directives may help children behave more consistently in a positive and productive way that is more conducive to receiving good school reports. The encouragement of positive behaviour could be considered the opposite to Jeynes' mechanism of the avoidance of harmful behaviour. Spiritual experiences may help students believe in their abilities,

[36] This mapping pattern is only one of many possible combinations and so is open to debate. The mapping decisions were driven by logical and conceptual considerations rather than through statistical methods. A factor analysis of the three religiosity measures here did however reveal only one underlying factor. Conceptually, it is possible to distinguish between "private" measures of religiosity (importance of religion and prayer) and "public" measures of religiosity (visits to places of worship). The boundary is fuzzy though, as prayer can take place both privately and publicly, but the measure used here is unable to distinguish between the two. The other two measures of religiosity may also have both public and private components.

feel confident in school, and find a source of support to help with challenges. These psychological effects may be broader than solely improving internal locus of control. Coping skills may help students persist in their studies, deal with failure, and find solutions to problems. Again, these skills may have broader effects than simply developing an internal locus of control and increasing work ethic. These three identified factors in turn may help students care more about education and aspire to higher attainment.

An alternative explanation is that students who are more religious also have more rigid daily routines, which may help them cope better with the routine of school. Similarly, increased religiosity may give children access to some social and cultural capital, network closure, and extra-community links, all of which could contribute positively to university aspirations. It is clear that further research needs to be carried out to understand the mechanisms behind the associations found here, and to see whether these effects are present for other academic outcomes.

An additional question is why might attending a religiously affiliated school not be associated with a greater likelihood of aspiring to university? The literature outlined in the literature review would seem to suggest that the benefits of religious school attendance should apply to all educational outcomes. One possible explanation is that if religiously affiliated schools have a non-random intake of students (which is likely), and if most ethnic minority students are more likely to aspire to university than White British students, then the clustering of these ethnic minority students in certain religious schools may be the driver behind the religious school effect. Thus once individual ethnic group and religious affiliation are considered, there are no longer any positive religious school effects.

There are a number of clear limitations to this research chapter. Firstly, small cell sizes made it impossible to create ethno-religious groups. The overlap of ethnic and religious groups, and the low numbers of some ethnic minority and religious groups, may mean that some key findings may have been obscured. This could also be why no significant interaction effects between ethnic group and religiosity were found; hence the results show the same effects of covariates for all ethnic groups (which may not be the case if sample sizes had been larger). Secondly, school level measures of religiosity were not available. Aggregating individual measures of religiosity to create school cohort measures is a rather imprecise and potentially inaccurate method. It would have been better to have also had measures of school-based religious practices to see whether institutional religiosity is influential, but unfortunately such data was not available. Thirdly, the mechanisms behind the effects identified are unclear and need more investigation. Data that better captures *how* religion influences the academic outcomes of young people is needed. Fourthly, the findings are limited to the university aspiration outcome looked at in this chapter. More work needs to be done to see if individual religious practices also affect other academic (and non-academic) outcomes. Finally, there may be effects of other measures of religiosity that were not investigated here e.g. scripture reading and participation in religious schools and festivals, and also the religiosity of parents, siblings, friends, and others. Looking at the religiosity of relevant others is a key step forward. This chapter has tentatively suggested that there are some effects of certain types of religiosity on academic outcomes but there is still much work to be done concerning the complex interplay of ethnicity, religion, and religiosity, and how these dimensions of individuals may unilaterally and bilaterally affect educational outcomes.

Chapter 4: Explaining interethnic variations in schoolwork attitudes and behaviours using Coleman's intergenerational social closure hypothesis

4.1 Introduction

This thesis has so far explored the social contexts and social capital available from schools and religious institutions to determine whether these social situations contribute to interethnic differences in education. This third empirical chapter considers the role of the family, and in particular, Coleman's thesis of the beneficial effects of what he terms "intergenerational social closure" (1990; 1991; 1988; Coleman 1987). In this chapter, the terms "parental closure" and "closed parental network" will be used interchangeably with Coleman's term "intergenerational social closure".

Coleman argued that children whose parents knew the parents of their friends would have better educational outcomes than their similar peers who did not belong to a social network with parental closure. This thesis chapter will empirically test Coleman's hypothesis to see whether there are any educational advantages of parental closure in terms of its association with schoolwork attitudes and behaviours. Tests will be carried out to see whether parental closure effects remain after controlling for other measures of parenting behaviours (parental care and support, parental severity, parental monitoring, and parental encouragement for school). Analyses of the effects of parental closure will be carried out both at the individual level and at the school cohort level to see whether contextual effects of parental closure exist. Finally, this thesis chapter will explore whether interethnic differences in school cohort level parental closure are associated with interethnic differences in schoolwork attitudes and behaviours.

The outcome measures used in this chapter capture attitudes to schoolwork in terms of the importance of school marks to the student, and schoolwork behaviour in terms of the amount of effort put into schoolwork by the student. The measures come from student self-reports. Attitudinal and behavioural measures such as these can be linked to school outcomes through the norms, values, motivation, and discipline they foster in students, which in turn can contribute to better educational achievement. In his own work, Coleman has linked attitudes and motivations to academic achievement, and noted discrepancies across ethnic groups in both attitudes towards schoolwork and the gap between attitudes and outcomes (Coleman et al. 1966). As such, educational attitudes might be important predictors of educational outcomes.

In summary, this chapter makes use of cross-sectional data from the first wave in England of the recent Children of Immigrants Longitudinal Study in Four European Countries (CILS4EU) (Kalter et al. 2013) to test Coleman's (1988) theory of parental closure to see if it is associated with an increase in positive schoolwork attitudes and behaviours (importance of school marks and effort put into schoolwork) of young people. The chapter tests for effects of parental closure at the individual level and at the school cohort level. It is plausible that variations in schoolwork attitudes and behaviours across ethnic groups may be linked to ethnic differences in educational outcomes. As such, this chapter explores whether parental closure is one of the mechanisms behind ethnic differences in educational outcomes.

4.2 Theory

General theories of family social capital tend to focus on parental involvement in their child's activities and parent-child relationships. Strong and positive parent-child relationships are theorised to be particularly important as otherwise children are unable

to access parental human capital resources (Coleman 1988; Coleman 1990). Social capital can be sourced from the family as the family system involves

"shared norms and feelings of belonging, as well as social support, and increased connections" (Parcel et al. 2010: 830).

Family social capital may contribute to child socialisation through the time and attention parents give to their children, through monitoring and supervising children's activities, and through the promotion of child well-being (Dufur et al. 2008; Parcel and Dufur 2001a; Parcel and Dufur 2001b; Hoffmann 2002; Kim and Schneider 2005). Family social capital theorists also argue that parental social connections with, for example, neighbours and work colleagues, can be useful for their children (Crosnoe 2004; Johnson et al. 2001; Dufur et al. 2008).

One of the most salient theories of parental involvement, and the focus of this chapter, is Coleman's (1988) theory of intergenerational social closure. Closure in a network is meant to be advantageous to the individual belonging to it as it implies members communicate with each other and share information, making it easier to enforce common norms and expectations through the use of sanctions and rewards (Coleman 1990). The theory of parental closure hypothesises outcomes in a specific instance of network closure. Specifically, the theory posits that closed social networks between children, their parents, and the parents of their friends provide educational advantages. The theory suggests that when Parent A and Parent B know each other they can

"set norms and standards for their children, and are not vulnerable to their children's exploitation of what rules exist for other children" (Coleman 1991:11).

Closed networks allow norms to be consistently reinforced across social contexts and to ensure children meet expectations and fulfil obligations through close monitoring by the adults involved in the child's life. Whilst Coleman conceptualised parental closure as an

individual level benefit i.e. that the advantages of parental closure accrue directly to children whose own parents maintain intergenerational social closure, other researchers such as Morgan and Sørensen (1999) have theorised that it is a network level benefit i.e. that the advantages of greater average levels of parental closure in the network will accrue to all children in the network regardless of whether or not their own parents maintain closure. Both conceptualisations of parental closure will be analysed in this chapter.

It is important to note that strong networks are not enough however; also relevant are the norms, values, and expectations that are conveyed through that network. In his earlier work, Coleman (1987) suggested that norms for academic success may vary across ethnic groups. As such, it is plausible that levels of intergenerational social closure vary across ethnic groups and contribute to ethnic differences in education.

The theory of intergenerational social closure will be explicitly tested in this research, and, in particular, whether effects of parental closure are robust to the inclusion of other measures of family social capital, such as parental monitoring of the child's activities, parental encouragement for school and education, parental knowledge of the child's friends, parental provision of care and support, and parental severity.

4.3 Potential mechanisms

Coleman's theory of parental closure provides a mechanism that should prevent problem behaviours and encourage the development of positive schoolwork attitudes and behaviours. This mechanism is the better monitoring of children's behaviour by the adults involved in the child's social life. The mechanism operates through the more consistent reinforcement of norms and values by adults who share these same norms and values for their own children. It is possible that differences in the quality and

quantity of family social capital may explain ethnic differences in education; that is, the ethnic groups that are educationally advantaged may also be those that have more and better family social capital. For example, proportionally more children of Caribbean background grow up in lone mother households. The Caribbean group is also educationally disadvantaged (e.g. lower performance in GCSE examinations). It is plausible that having only one parent in the household means these children have fewer resources linked to family social capital (e.g. lower monitoring of the child's activities by the parent), which in turn leads to lower educational outcomes.

Differences in the quality and quantity of family social capital across ethnic groups may be due to the differential cultural outlooks, attitudes, and values of each group, which in turn influence how members of different groups react to the choices put before them and how they pass their values on to the next generation. The mechanisms of cultural outlook and cultural pressure may also vary according to generational status and the assimilation path ethnic minority students choose to take (Portes and Zhou 1993). Following on from the idea of different cultural outlooks, it may also be the case that ethnic groups vary in the extent that parental or cultural pressure to conform to certain behaviours and expectations exist. For example, in her studies of Chinese and Vietnamese children, Zhou (1998) argues that there is a strong normative climate that the children behave in a certain way and fulfil particular expectations, as would be expected by Coleman (1990). This cultural pressure could be a mechanism through which differential educational and attitudinal outcomes occur.

Due to limitations in the data, it is not possible to explicitly test mechanisms of cultural outlooks, cultural pressure, and the consistent transmission of cultural values as the driver behind any beneficial effects of parental closure identified in this research. It is possible, however, to test whether residual effects, which could be attributed to parental

closure, remain after controlling for other parenting behaviours. These possible mechanisms are discussed here to provide potential explanations for any associations between intergenerational social closure and the outcomes of interest in this study.

4.4 Previous research

4.4.1 Previous research on intergenerational social closure

As described earlier in this chapter, the theory of parental closure hypothesises that children will be more successful if they belong to a closed network in terms of their parents knowing the parents' of their friends. This is expected to improve children's school outcomes because such a closed network features norms, obligations, and expectations which are consistent across social environments and which are reinforced by the adults in contact with the children. Parents who know the parents of their children's friends may be able to better gauge the values, goals, and aspirations of their children's peers, and thus determine whether or not their children are

"hanging out with the wrong crowd and intervene (if necessary)" (Carbonaro 1998: 297).

Despite the hypothesis being clear and seemingly simple to test, there has not been much empirical work on this topic. This is likely to due to limitations in available and appropriate data upon which to test Coleman's hypothesis. Nevertheless, there are two well known empirical pieces on the topic that provide some evidence for and against Coleman's theory.

Beginning with the earliest of the two works, Carbonaro (1998) tested Coleman's intergenerational closure hypothesis on US data from the National Educational Longitudinal Study (NELS) of 1988. The NELS dataset is one of the few datasets which included a measure of whether parents knew their children's friends' parents. The dataset included 16,849 school students who were interviewed in wave 1 (grade 8 in

1988) and also in wave 3 (grade 12 in 1992), and has an oversample of minority students. Carbonaro found a positive association between parental closure around school and achievement in mathematics, with an increase in 13% of a year's progress in maths being accounted for by every extra student friendship in which the parents also know each other. Carbonaro's paper indicates that parental closure is positively associated with educational outcomes, leading to a first hypothesis.

H1: Parental closure at the individual level will be associated with a higher likelihood of strongly agreeing that school marks are important, and a higher likelihood of strongly agreeing that a great deal of effort is put into schoolwork.

However, there did not appear to be any significant effects of closure in any other subject, nor with grade 12 grade point averages. There was, however, a relationship between closure and risks of high school drop-out, with students with more closure being less likely to drop out of high school by grade 12. Whilst there is a drawback[37] to using achievement grades as dependent variables without controls for prior attainment, nevertheless these are important measures of achievement as they are used by high schools to determine graduation, and by employers to assess employability.

An advantage of Carbonaro's data is that the degree of parental closure can be measured as parents were asked "do you know the parents of your child's first friend?" with "first" replaced by "second", "third", "fourth" and "fifth". This is a more accurate measure than that used in this research chapter, which uses the student's report (rather than the parents) and only asks about degree of agreement to the statement "my parents

[37] The drawback arises because absolute academic achievement is likely to be influenced by a very wide range of factors, many of which may not have been captured in the dataset, leading to risks of omitted variable bias and potentially spurious correlations. A better dependent variable is one based on academic progress, provided these omitted factors can be captured in a prior attainment measure.

want to know the parents of my friends" rather than the extent of closure. However, both Carbonaro's and this chapter's own measure of parental closure could be improved by data that captures not just the existence of parental relationships, but how these relationships are used and whether norms, values and sanctions are effectively transmitted through such relationships.

In the second main empirical paper on parental closure, Morgan and Sørensen (1999) repeated Carbonaro's analysis using the same NELS 1988 data. The first difference between the two studies is that Morgan and Sørensen included a control for the presence of friends within school, whilst Carbonaro did not. It seems that the omission of this control from the analysis resulted in a significant positive correlation between parental closure and maths achievement, but that once the in-school friends control is included, the association becomes negative. Carbonaro himself repeated his own analysis with the in-school friends control in and accepted that his earlier conclusions were spurious (Carbonaro 1999).

H2: Effects of parental closure at the individual level will not be robust to the inclusion of measures of in-school friendships.

It is possible, however, that Carbonaro's results can be maintained if one considers parental closure to have both direct and indirect effects. Indirect effects of parental closure could manifest through parental influence upon the child's friendship choices. It could be the case that parents who seek to know the parents of their child's friends also encourage their child to make friends with their peers within school whilst discouraging out-of-school friendships. This would mean that the in-school friends measure used in past research may be capturing a mediated effect of parental closure i.e. that parental closure produces effects through parental influence on friendship choice. Similarly,

parental closure effects may themselves be mediated effects of other parenting behaviours, such as the general involvement of parents in the lives of their children, parental encouragement for school, and the provision of parental care and support. Without controlling for other measures of parental behaviours, it is not possible to tell whether there is a specific effect of parental closure, or whether parental closure is just one aspect of a range of behaviours that make up "good parenting". Coleman argues for the existence of parental closure effects specifically, hence a third hypothesis based on this argument.

H3: Effects of parental closure at the individual level will be robust to the inclusion of other measures of parenting behaviours.

In terms of variations in intergenerational social closure across ethnic groups, there has not been any empirical work that explicitly tests Coleman's hypothesis. However, there has been some theory put forward suggesting that parental closure contributes to the relatively better educational outcomes experienced by some minority students. Zhou (2005) puts forward her theory of ethnic social capital, arguing that intergenerational closure, norms enforcement, and ethnic community organisations may all help foster high academic achievement in Asian students. In a similar vein, Modood (2004) has hypothesised that the school success of Chinese and South Asian students in Britain may be due to a combination of parental ambition and parental authority, with the behaviour of minority students typically being under the control of the immediate family and also the wider ethnic community. In this way, the relationships between children and their parents allow the transmission of consistent aspirations and attitudes, whilst general pro-education norms are reinforced within the community. Modood argues that such social capital compensates for the limited economic capital available to some minority students, and thereby allows educational achievement and social

mobility to be reached. So far there does not appear to be any literature that has combined theories of ethnic social capital to that of intergenerational closure to explain the differing rates of educational success across ethnic groups. As such, Zhou's and Modood's arguments for ethnic social capital (operationalised as variations in the level of parental closure across ethnic groups) form the basis of an interesting hypothesis that can be tested in this research chapter, assuming that parental closure as a main effect is itself positively associated with schoolwork attitudes and behaviours.

H4: Controlling for individual level parental closure will result in the effects of ethnicity on schoolwork attitudes and behaviours being reduced.

Returning to Morgan and Sørensen's work (1999), a second key difference between their approach and Carbonaro's is that they treated parental closure as a school level attribute rather than an individual level attribute. Morgan and Sørensen found that parental closure around school (school-level social closure) had a negative effect on students' progress in mathematics. In his critique of their work, Carbonaro (1999) disagreed with their argument that open networks are better for mathematics progress because there are more opportunities to share information in open networks rather than closed networks. Morgan and Sørensen did not show any evidence for their proposed explanation in their paper.

Carbonaro further disagreed with Morgan and Sørensen's treatment of the intergenerational social closure variable, as they used an aggregated measure of individual closure at the school cohort level to proxy for closure at the school level (as this thesis chapter does), and suggested that more closure at the school level would provide a benefit for all students regardless of whether or not they had individual level closure. It seems that a measure of intergenerational social closure that is truer to

Coleman's original conception would be at the individual level, as "an individual student's connections to other members of the social network are of crucial importance" (Carbonaro 1999: 682) because these connections are the mechanisms through which closure allows parents to monitor and control the behaviour of their children. As such, school level closure should not make a difference without the existence of individual level closure. Nevertheless, these differing measures of closure and the differences in the variables included in the analyses have provided two contradictory pieces of evidence for and against Coleman's hypothesis and so need to be tested simultaneously. The fifth hypothesis is based on Morgan and Sørensen's findings (and to a lesser extent on Morgan and Todd's (2009) findings that Catholic schools have higher levels of parental closure).

H5: School cohort level intergenerational social closure will be associated, net of individual-level closure and relevant cohort composition controls[38], with a higher likelihood of positive schoolwork attitudes and behaviours.

H6: School cohort level intergenerational social closure will be associated, net of individual-level closure, with a higher likelihood of positive schoolwork attitudes and behaviours to differing extents across ethnic groups.

The sixth hypothesis follows from the fifth and is based on the expectation that parental closure effects at the school cohort level may vary across ethnic groups.

[38] These relevant school cohort composition controls are the proportion of ethnic minority students in the cohort and the proportion of students in the cohort with at least one parent educated to degree level.

4.4.2 Previous research on schoolwork attitudes and behaviours

There is a substantial amount of evidence associating schoolwork attitudes and behaviours with academic outcomes. For example, increased educational aspirations are thought to positively affect educational performance, and in turn, educational attainment (Sewell et al. 1969). A number of authors have found that students who have a value-based motivation for their academic work will experience greater and better cognition and improved effort, which contribute to better educational outcomes (e.g. Ames and Archer 1988; Dweck and Elliott 1983; Eccles 1983; Meece et al. 1988). Academic motivation has been found to have a positive impact on school performance, with perceived academic competence and perceived academic self-determination influencing academic motivation (Fortier et al. 1995).

Some studies have gone further and found relationships between parental support, intrinsic motivation, and academic performance. Students from families where parental encouragement was provided in response to school marks were found to be more likely to have an intrinsic motivational orientation i.e. students whose parents encouraged them for doing well at school were more likely to be motivated by school and learning and to care about their schoolwork (Ginsburg and Bronstein 1993). There are clear links between family social capital (as measured by parental attachment to the child, supervision of the child, and involvement in the child's activities) and the time spent bonding with, interacting with, and teaching the child (Salmi and Kivivuori 2006; Sampson and Laub 1993; Wright, Cullen et al. 2001). Parent-child bonds are hypothesised to reduce levels of delinquent behaviour as strong bonds make it easier to convey social norms and enforce the child's obligations to the parents (Coleman 1990; Jang and Smith 1997; Hirschi 1969). Generally, there is a large body of research

detailing positive influences of academic motivation on academic performance (Parsons, Adler et al. 1984; Grolnick, Ryan et al. 1991; Keeves 1986).

Alongside motivation, effort management is connected to higher levels of academic achievement, especially in terms of students' abilities to maintain persistent effort and work diligently (Pintrich and de Groot 1990). The effort that students put into their schoolwork is significantly linked to their learning, suggesting that increasing a student's schoolwork effort could increase their educational performance (Carbonaro 2005). Students' "work habits" (as measured by effort put into schoolwork, class participation, levels of organisation, and homework preparation) were associated with their GPAs and academic competences in their subject courses (Farkas, Grobe et al. 1990). Similarly, students who reported spending more time on their homework (a common measure of schoolwork effort) tended to have higher achievement (e.g. Natriello and McDill 1986; Carbonaro and Gamoran 2002; Alexander and Cook 1982), although there are issues identifying the causal direction of such associations in cross-sectional studies. Nevertheless, it seems both that school motivation and school effort are associated with educational performance, and so influences upon these schoolwork attitudes and behaviours may have indirect effects on educational performance. Again, parental closure is a potential candidate for the fostering of certain pro-school attitudes and beliefs, but research on this is lacking. As such, this thesis chapter contributes to the field by testing Coleman's hypothesis on a different range of outcomes (schoolwork attitudes and behaviours) that are indirectly linked to educational achievement.

4.5 Contribution to the field

Aside from the two papers detailed in the literature review, there is not much empirical work on intergenerational social closure. In his paper, Carbonaro cites Coleman and

Hoffer's (1987) own book on parental involvement, family social capital, and schooling outcomes for children, but notes that Coleman and Hoffer did not use a measure of intergenerational social closure in their study and so did not provide empirical support for the theory, just hypothetical statements. Carbonaro further notes that Bryk, Lee, and Holland (1993) also failed to find evidence for or against Coleman's theory in their paper on Catholic schools. As such, there is scope for this research chapter to contribute to the field by explicitly testing Coleman's hypothesis using new data on the topic, by looking at both individual and school cohort level parental closure measures, and by considering direct and indirect effects of parental closure. Further, this chapter can contribute to the field by investigating a range of educationally relevant outcomes rather than just academic achievement measures. Finally, the field is lacking in work on variations in the effects of parental closure across ethnic groups, and parental closure has yet to be empirically tested as a potential explanation for differing educational outcomes across ethnic groups, so this chapter can also improve understanding in these areas.

4.6 Data and methods

The data for this study comes from the English portion of wave 1 of the Children of Immigrants Longitudinal Survey of Four European Countries (CILS4EU). This comprises initial data from 4,315[39] fourteen and fifteen year old students attending 107 schools in England. The students were all in Year 10 during the academic year 2010-2011. The school sample was chosen using a stratified random sampling method, with

[39] There were 4,427 sampled students but 112 of these students dropped out before completing the wave 1 survey and so were removed from the analysis.

stratification taking place according to the ethnic density of schools[40]. Two mixed ability classes were interviewed in most schools with a mean of 40.1 students interviewed per school[41]. All schools were retained for the analysis. Students who were missing data on any of the variables of interest were also removed from the analysis. These case exclusions will be detailed later in this section. Descriptive statistics for variables and a correlation matrix can be found in the Appendices in Table 31, Table 32, and Table 33.

4.6.1 Individual level independent variables

The independent variables in the analysis included in all models are standard socio-demographic controls for age; gender; ethnic background (details on categorisation process to follow); cognitive ability test score (standardised); highest completed parental education; school ethnic density stratum; and family type (two parent family; single mother family; single father family; other adult family). The family type variable was included to account for the availability and dilution of parental resources (such as intergenerational social closure) in the family. It is plausible that households with fewer than two parents may be relatively disadvantaged in terms of reaching similar levels of intergenerational social closure to those households where two parents are around to create and maintain closure.

The indicator of the highest completed education of the student's parents was created by combining the student's reports of the highest completed education of each of mother

[40] Stratum 1 included schools with 0-10% of the student population being of ethnic minority origin; stratum 2 included schools with 10-30% ethnic minority; stratum 3 included schools with 30-60% ethnic minority; stratum 4 included schools with 60-100% ethnic minority.
[41] Standard deviation of number of pupils interviewed in schools is 9.17(2.d.p.). The maximum number of students interviewed in a school was 60; the minimum number was 12.

and father. The response options for highest educational qualification were "none", "primary or equivalent", "secondary or equivalent" and "university or equivalent".

Cognitive ability was measured by performance in the cognitive ability test administered during the survey. This control was included to separate out effects of ability from those of motivation when considering schoolwork attitudes and behaviours as dependent variables. The cognitive ability test score measure in the models was standardised across the sample.

4.6.2 Ethnic background categorisation

Ethnic background was constructed using a three stage process. Firstly, students born abroad were allocated to ethnic origin groups based on their region of birth. Secondly, the remaining students born in the UK with parents who were born abroad were allocated based on the region of birth of their parents. If either parent was born abroad, the student was allocated to the corresponding non-White British ethnic origin group. Where there were differences in the regions when both the mother and the father were born abroad, then the student was allocated to the mother's region. Thirdly, the students born in the UK with parents who were also born in the UK were allocated to ethnic origin groups using their response to an ethnic belonging question[42]. Students with ethnic groupings that were missing after the three stage process were placed in the "No group/missing" ethnic background category. Students who reported being born in Britain, reported both parents also born in Britain, and reported that they belonged to

[42] Students were asked which group(s) they felt they belonged to and presented with a list of ethnic categories and an "other" category where they could record an open response. This question was not used as the main determinant of ethnic origin due to greater difficulties in interpreting student's responses compared to the clearer measures of country of birth and parents' countries of birth.

"no other group" for the question on ethnic belonging were classified into the White British group.

Ethnic groups with small numbers were combined into one group in order to ensure ethnic categories had sufficient sample numbers for analysis purposes. Unfortunately, this combining of categories resulted in the loss of a lot of detail concerning ethnic background and origin. This resulted in seven broad ethnic background groups and one "no group/missing" category. The ethnic categories were: White British, White Other, Indian, Pakistani, African, Caribbean, Other, and No group/Missing. The White British group was chosen as the reference category because of its large size and because the ethnic majority group is typically used as a reference group in ethnicity research. Strength of ethnic identity was not included in the analysis due to limited response to this question.

4.6.3 Family social capital

Family social capital was conceptualised in the analysis using indicators of different types of parenting behaviours, which capture the relationship between the parents and the child. Students who maintain positive connections to their parents should be better able to use these connections to access parental resources.

There were twelve measures of parenting behaviours in the wave 1 student survey (excluding the indicator of parental closure, which is detailed below). These twelve measures were all statements to which students were asked to note the degree of their agreement on a 5-point scale ranging from "strongly agree" to "strongly disagree". These items were entered into a factor analysis, which showed that the items loaded on to four factors. The results of the factor analysis formed the basis of the four scales for

the different types of parenting behaviours detailed below. The rotated factor matrix can be seen in the Appendices.

The first scale used four items[43] from the first identified factor. The items that had high factor loadings on to the first factor are assumed to measure parental care; as such, the first scale created from these four items measures parental care. The parental care measure was the average score from four statements where students were asked to report how strongly they agreed with the statement (alpha = 0.87). The four parental care statements were: "my parents try to understand what I think and feel"; "my parents show me that they love me"; "my parents try to help me when I have a problem"; and "whenever I feel sad my parents try to comfort me". The responses were reverse coded so that "strongly agree" was coded as 5, "agree" as 4, "neither agree nor disagree" as 3, "disagree" as 2, and "strongly disagree" as 1.

The second scale used three items[44] from the second identified factor. The items that had high factor loadings on to the second factor are assumed to measure parental encouragement and support for school; as such, the second scale measures parental encouragement for school. The items that make up the second scale were based on the following three statements. The first statement was "my parents encourage me to work hard for school". The second statement was "my parents are interested in my grades and achievement". The third statement was "my parents tell me they are proud of me when I do well at school". The responses to each item were reverse coded as detailed above.

[43] The variable names of these four items in the factor matrix are parcomfort, parhelp, parshowlove, and parfeel.
[44] The variable names of these three items in the factor matrix are pargrades, parproud, and parworkhard.

The average score across the three items was used as the measure of parental encouragement for school (alpha = 0.80).

The same method was applied to the three items that had high factor loadings on to the third factor. These items[45] were used to create a third scale to measure parental severity (alpha = 0.65). The three items used here were: "my parents often tell me to be quiet"; "my parents are very strict with me even over small things"; and "my parents often criticise me". The items were not reverse coded.

The fourth scale was assumed to indicate parental monitoring and control behaviours. There were two items[46] that loaded on to the fourth factor, which are the basis of the fourth scale. The statements from which these items were drawn were: "I have to tell my parents where I am and what I am doing when I am not at home"; and "my parents say I must tell them everything I do". These items were also reverse coded. The average score across these two items was used as the measure on the scale of parental monitoring (alpha = 0.62). When it was subsequently included, the parental closure measure also had a high loading on this factor (not shown in the appendix), but as the focus of this chapter is the analysis of the effects of parental closure, it was not included in the parental monitoring scale.

4.6.4 Friendship variables

Following Morgan and Sørensen's (1999) earlier work, a measure for friends in school was included. This measure was a dummy variable indicating whether all of the

[45] The variable names of these three items in the factor matrix are parquiet, parstrict, and parcriticise.
[46] The variable names of these two items in the factor matrix are parmonitor and parcontrol.

student's nominated friends[47] attended the same school as them. Data from the social networks module of the dataset was used to create a dummy indicator to show whether any of the student's classmates were known to the student's parent (as reported by the student). Students who left this item blank were coded as 0 classmates known to the parent. Students who reported one or more classmates as being known to their parents were coded as 1 for this variable. This measure of friends being known to the parent was included to test whether any potential effects attributed to parental closure are actually due to parents knowing the friends themselves rather than parents knowing the friends' parents.

4.6.5 Parental closure variable

The intergenerational social closure variable was measured by the survey item "my parents want to know the parents of the friends I hang out with." Responses were chosen from the five point agreement scale, ranging from strongly agree to strongly disagree. These responses were dichotomised into a dummy variable (parental closure) where instances in which students responded that they strongly agreed with the statement were coded as 1. The intergenerational social closure item was the second item in a three item battery[48] that measured parental control over the student's life and activities. It is possible that the inclusion of the word "want" in the survey item means that responses capture both actual parental closure and also desired (but not realised) parental closure. Thus this survey item tests a more generalised version of Coleman's hypothesis with relaxed assumptions as it potentially measures both desired and actual intergenerational social closure. This is why the responses were dichotomised into a

[47] Students were asked to nominate up to five "close" friends and provide some information about them.
[48] The other two items were: "my parents say that I must tell them everything I do" and "I always need to tell my parents exactly where I am and what I am doing when I am not at home".

dummy variable as it assumed that those students who "strongly agree" to the statement will also be those who are the most likely to have parents who convert their "want" for closed parental networks into actually closed parental networks. Unfortunately the cognitive testing of this item did not seek to distinguish between students' understanding of this item as the desire of their parents to achieve closed parental networks versus the actual achievement by their parents of closed parental networks.

4.6.6 School cohort level independent variables

As mentioned previously, data was collected from students within schools, with only one school cohort[49] sampled from within each school. The school cohort was chosen as the level 2 unit of analysis rather than the whole school as it was deemed unreasonable to infer school-level effects from data representing only one school cohort within the school. Aggregated measures of the proportion of ethnic minority students in the school cohort, the proportion of students with at least one parent educated to degree level in the school cohort, and the proportion of students with parental closure (defined as strong agreement to the statement "my parents want to know the parents of the friends I hang out with") in the school cohort were created and included in the analysis to test for school cohort level effects. Additionally, a set of dummy variables indicating the ethnic density strata of the school[50] were also included in all models to adjust for the over-sampling of students attending ethnically dense schools and to test for school ethnic contextual effects.

The proportion of minority students in the school cohort was included to control for cohort ethnic minority density. The proportion of students with one parent educated to

[49] Two classes were sampled from the Year 10 school cohort within each school in most cases.
[50] The ethnic density strata of the school sampling frame were used for these dummies. See footnote 29.

degree level in the school cohort was included to control for any effects of parental education that would otherwise be captured by the school cohort level parental closure measure. It is possible that highly educated parents may be more involved in their children's lives, and so the inclusion of a school cohort level parental education measure reduces the risk of confounding school cohort level parental closure effects with school cohort level parental education effects.

A full correlation matrix for all independent variables in the analyses can be seen in Table 33 in the Appendix.

4.6.7 Dependent variables

There were two outcome measures of interest in this analysis. The first dependent variable is related to schoolwork attitudes and concerns the importance of school marks to the student. Students were asked to report the strength of their agreement to the statement "it is very important to me to get good marks at school". Responses were on the standard 5-point scale ranging from "strongly disagree" to "strongly agree" and were dichotomised so those "strongly agree" responses were coded as 1 and all other responses were coded as 0.

The second dependent variable is related to schoolwork behaviours and concerns effort put into school work. Students were asked to report the strength of their agreement to the statement "I put a great deal of effort into my school work". Again, this variable was dichotomised.

The dependent variables were dichotomised for two reasons. First, responses that report strong agreement to the two items in questions are those that capture the most positive attitudes and behaviours concerning schoolwork. If one cautiously assumes that the more positive the attitude towards schoolwork and the schoolwork behaviour, the better

the eventual educational outcome, then strong agreement to these two items should lead to better educational outcomes. In other words, strong agreement should be where the greatest educational advantage lies. Secondly, as can be seen in dependent variable columns of Table 12, the distribution of responses for both these items were rather skewed towards the more positive responses. This is especially so for the importance of school marks measure. This could be because students want to conform to what they believe are the "correct" or "appropriate" responses. Alternatively, students may be providing true responses, and so the response categories imposed on students here have lead to the placement of an artificial upper limit on responses. In any case, "the action" lies between "strongly agree" and the other categories, leading this to be the logical binary distinction. The full range of responses could have been used and a multilevel ordered logistic regression model estimated, but this was deemed to be a less than optimal approach because of the distribution of the data and the low numbers of cases for the neutral and disagreement response categories.

These two measures of schoolwork attitudes and behaviours capture how much students cared about their school performance and how much students were willing to work hard in school. These measures were used to test whether parental closure reinforces any pro-school norms and encourages attitudes and behaviours related to school that are conducive to better educational outcomes. Conceptually, although the two items are correlated ($r = 0.29$), they are different as the former measures a value whilst the latter measures an action. This allows the measure of parental closure to be tested to see whether it potentially ultimately leads to better educational outcomes (as hypothesised by Coleman) through its effects on children's values or on their behaviours (or both).

It is important to be up-front about the difficulties in determining the direction of causality as the analysis is carried out upon cross-sectional data. It is plausible that the

student's more negative schoolwork attitudes and behaviours trigger increased parental closure rather than parental closure leading to increases in positive schoolwork attitudes and behaviour. As such, causal interpretations must be made cautiously.

The nature of these recoded dependent variables means that logistic regression modelling techniques are the most appropriate method of analysis. The nested nature of the data, with students clustered in schools, meant that multilevel modelling strategies were needed so as to account for the clustering of observations.

4.6.8 Sample selection and excluded cases

A number of cases were removed from the dataset because of missing data. In terms of the dependent variables, forty three cases were dropped because the student had not responded to the item concerning effort put into school work. Five additional cases were lacking information on the importance of school marks to the student and so were excluded.

In terms of independent variables, twenty cases were excluded because the student reported an age other than 14 or 15[51], whilst an additional sixty nine cases were excluded because they reported no information on age at all. Students missing the necessary data (own, mother's, and father's country of birth; self-reported ethnic group belonging) to categorise them into ethnic groups were classified into a "no ethnicity missing" ethnicity category in order to keep these students in the analysis. In similar way, students missing information on their mother's or their father's highest completed educational qualifications were retained in the analysis and these respondents coded into a missing category.

[51] Nine students reported an age of 13; ten students reported an age of 16; one student reported being 17.

Forty one students were removed from the analysis because they had no cognitive ability test score information. Sixty nine students were dropped because it was unclear whether they lived with two parents, one parent, or neither parent.

There were a number of cases dropped because they were missing the information needed to construct one or more of the parental behaviour scales. Fifteen cases were dropped because of missing information for the parental encouragement for school scale. Sixty one additional cases were excluded because they did not have the necessary information to construct the scale of parental care. Thirty nine more cases were dropped because of missing information for the parental monitoring scale, whilst another forty nine cases were lacking information for the parental severity scale and so were excluded.

In terms of the key predictor variable of parental closure, four students did not report their parents' interest in knowing the parents of their friends, meaning these cases were excluded. Students were asked to provide information on up to five best friends. Cases were dropped where information was missing as to whether the friends were from within the school or not (46 cases).

After these cases (575 in total) were excluded, the final sample of 3,740 students from 107 schools remained for the analyses.

Table 12 shows the distribution of the final sample. Of immediate interest is the difference across ethnic groups in the proportion of students reporting parental closure (strong agreement to the statement that parents want to know the parents of their friends). The White British group report the lowest parental closure; the African and the Caribbean groups both report parental closure almost three times more frequently.

In terms of reporting strong agreement to the importance of school marks to self, again the White British group lag slightly behind, as do those in the No ethnic group/Missing ethnic group category. The vast majority of the Indian, Pakistani, African, and Other ethnicity groups report strong agreement to the importance of school marks.

In terms of reporting strong agreement to putting in a great deal of effort into schoolwork, all groups report consistently lower proportions for this dependent variable compared to the importance of school marks variable. The difference between importance of school marks and effort put into school work can be clearly seen, with at least a forty percentage point gap for all groups. Students appear much less willing to put in (or report putting in) a great deal of effort into their school work, even though they report that their grades are important to them.

Table 12 Distribution of schoolwork attitudes sample

Ethnic Group		Sex		At least one parent with a degree		Parental closure		Strongly agrees it is important to get good grades		Strongly agrees to putting in a great deal of effort into schoolwork		Total
		Boy	Girl	No	Yes	No	Yes	No	Yes	No	Yes	
White British	N	1,140	1,117	1,591	666	2,092	165	957	1,300	1801	456	2,257
	%	50.9	49.1	75.9	24.1	93.6	6.4	43.5	56.6	80.2	19.8	100.0
White Other	N	127	103	148	82	197	33	89	141	173	57	230
	%	53.4	46.7	70.4	29.6	83.4	16.6	39.2	60.8	74.0	26.0	100.0
Indian	N	123	112	142	93	203	32	52	183	154	81	235
	%	60.1	39.9	62.0	38.0	87.2	12.8	25.2	74.8	67.3	32.7	100.0
Pakistani	N	151	124	200	75	246	29	71	204	219	56	275
	%	53.5	46.5	72.0	28.0	88.6	11.4	28.6	71.4	79.3	20.7	100.0
African	N	107	107	94	120	164	50	50	164	156	58	214
	%	52.0	48.0	47.4	52.6	81.9	18.1	24.2	75.9	66.8	33.2	100.0
Caribbean	N	53	76	90	39	104	25	43	86	106	23	129
	%	42.4	57.6	65.4	34.6	81.3	18.8	39.2	60.8	83.7	16.3	100.0

Ethnic Group		Sex		At least one parent with a degree		Parental closure		Strongly agrees it is important to get good grades		Strongly agrees to putting in a great deal of effort into schoolwork		Total
		Boy	Girl	No	Yes	No	Yes	No	Yes	No	Yes	
Other	N	145	139	177	107	250	34	78	206	220	64	284
	%	57.8	42.2	67.1	32.9	86.1	13.9	24.4	75.6	80.7	19.3	100.0
No group / Missing	N	45	71	56	60	96	20	38	78	81	35	116
	%	44.0	56.0	62.4	37.6	84.9	15.1	48.3	51.7	72.4	27.6	100.0
Total	N	1,891	1,849	2,498	1,242	3,352	388	1,378	2,362	2,910	830	3,740
	%	51.4	48.6	73.2	26.8	91.6	8.4	40.7	59.4	79.0	21.1	100.0

Note: Weighted percentages; unweighted Ns.

As with importance of school marks, there are ethnic differences evident for the schoolwork effort measure. Whilst approximately one third of Indian students and African students report putting in high effort, only one-fifth of White British students do so, and as few as 16% of Caribbean students.

In terms of parental background the African group have relatively high proportions of parents with a university education. The White British, White Other and Pakistani groups have relatively lower proportions of highly educated parents. However, because approximately 60% of the sample is made up of White British students, the vast majority of students who have at least one parent with a degree are White British students simply because of sample composition.

4.7 Results

Results can be seen below in Table 13 for the importance of school marks to self and Table 14 for the effort put into schoolwork. All coefficients are displayed as log-odds coefficients. There are 3,470 students from 107 schools in all models. Multilevel modelling logistic regression techniques using the *xtmelogit* command in STATA 12 are used to produce these model estimates.

Cognitive ability test score is standardised in all models, as are the four parenting behaviour scale measures, and the three cohort level contextual measures. All models include controls for sex, age, highest parental education, cognitive ability test score, family structure, school stratum, and ethnic group. For the sake of brevity, and because these controls behave as expected, the coefficients for all control variables, apart from ethnic group dummies, are excluded from the model tables presented here. Full model tables can be seen in Table 35 and Table 36 in the Appendices.

Table 13 models the likelihood of reporting strong agreement that getting good grades is important to the student. As can be seen in Model 1, net of the controls mentioned above, all ethnic groups (bar the No ethnic group/Missing category) are significantly more likely to report that getting good grades is important to them than the White British reference group. The results are highly significant for all ethnic groups, except for the Caribbean group, where significance is seen at the 0.05 level. As such, there is evidence that there are significant ethnic differences in this first measure of school work attitudes.

The parental closure measures are added in Model 2. Students who have parental closure experience a positive, significant association between this and the likelihood of strongly agreeing that school marks are important. This provides support for H1: parental closure at the individual level is associated with the higher likelihood of strongly agreeing that school marks are important.

In model 3 variables for whether the parents know any classmates, and whether all nominated friends are from within school are included. The coefficients for parental closure remain significant, leading to a rejection of H2 as effects of parental closure at the individual level do appear to be robust to the inclusion of measures of in-school friendships. This is counter to Carbonaro's findings (1998), where parental closure effects disappeared once in-school friendships were controlled. There is less support here for indirect effects of parental closure through influences upon friendship choice as the main effect of parental closure persists in Model 3 even with the introduction of the two friendship measures.

Model 4 sees the introduction of the four parenting behaviour scales. There are two significant effects here. The parental encouragement for education measure and the

parental monitoring measure are both positive and significantly associated with the importance of school marks. The parental severity and parental care measures are not significantly associated with the outcome.

As can be seen in Figure 10, the average marginal effects of parental closure are reduced but remain significant in model 4. Thus H3 is supported as effects of parental closure at the individual level are robust to the inclusion of other measures of parental involvement and encouragement. The support for H3 must be somewhat tempered however, as the size and significance of the parental closure effect are both clearly reduced in model 4 once other measures of parenting behaviours are included. Model 4 has the lowest BIC statistic of all the estimated models, suggesting that this is the best fitting model of those estimated.

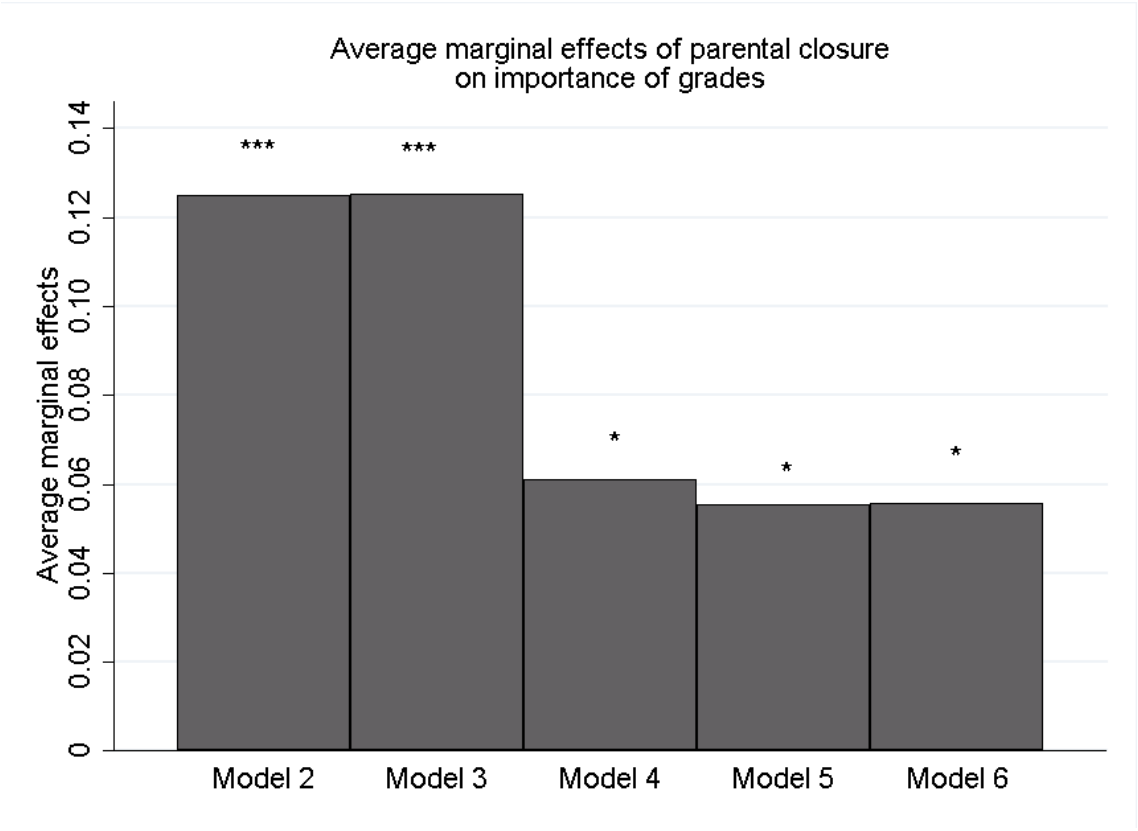


Figure 10 Average marginal effects of parental closure on the importance of school marks

Table 13 Logistic regression model predicting the importance of getting good marks

	Model 1		Model 2		Model 3		Model 4	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Ethnic group (ref = White British)								
White Other	0.07	(0.15)	0.04	(0.15)	0.03	(0.15)	0.11	(0.16)
Indian	0.74***	(0.18)	0.72***	(0.18)	0.72***	(0.18)	0.72***	(0.19)
Pakistani	0.63***	(0.16)	0.63***	(0.16)	0.63***	(0.16)	0.63***	(0.17)
African	0.78***	(0.18)	0.71***	(0.18)	0.71***	(0.18)	0.67***	(0.19)
Caribbean	0.31	(0.20)	0.27	(0.21)	0.26	(0.21)	0.27	(0.22)
Other	0.57***	(0.15)	0.55***	(0.15)	0.54***	(0.15)	0.61***	(0.16)
No ethnic group/Missing	0.33	(0.21)	0.29	(0.21)	0.29	(0.21)	0.28	(0.22)
Parental closure			0.60***	(0.13)	0.61***	(0.13)	0.31*	(0.14)
Parents know at least one classmate					-0.04	(0.08)	-0.09	(0.09)
All nominated friends from in school					-0.02	(0.07)	-0.07	(0.08)
Parental encouragement scale (std.)							0.69***	(0.05)
Parental care scale (std.)							-0.00	(0.05)
Parental monitoring scale (std.)							0.12**	(0.04)
Parental severity scale (std.)							0.01	(0.04)
Constant	0.13	(0.18)	0.10	(0.18)	0.14	(0.19)	0.47*	(0.20)
Level 2 variance	0.08***	(0.03)	0.07***	(0.03)	0.07***	(0.03)	0.06***	(0.03)
BIC	4952		4937		4953		4640	

	Model 5		Model 6		Model 7	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Ethnic group (ref = White British)						
White Other	0.10	(0.16)	0.09	(0.16)	0.11	(0.16)
Indian	0.73***	(0.19)	0.69***	(0.19)	0.70***	(0.19)
Pakistani	0.64***	(0.17)	0.60***	(0.17)	0.64***	(0.18)
African	0.66***	(0.19)	0.63***	(0.19)	0.56**	(0.20)
Caribbean	0.26	(0.22)	0.24	(0.22)	-0.02	(0.24)
Other	0.60***	(0.16)	0.58***	(0.16)	0.63***	(0.16)
No ethnic group/Missing	0.27	(0.22)	0.26	(0.22)	0.28	(0.23)
Parental closure	0.28*	(0.14)	0.29*	(0.14)	0.28*	(0.14)
Parents know at least one classmate	-0.09	(0.09)	-0.08	(0.09)	-0.08	(0.09)
All nominated friends from in school	-0.07	(0.08)	-0.07	(0.08)	-0.07	(0.08)
Parental encouragement scale (std.)	0.69***	(0.05)	0.69***	(0.05)	0.68***	(0.05)
Parental care scale (std.)	-0.00	(0.05)	-0.00	(0.05)	-0.01	(0.05)
Parental monitoring scale (std.)	0.12**	(0.04)	0.12**	(0.04)	0.12**	(0.04)
Parental severity scale (std.)	0.01	(0.04)	0.01	(0.04)	0.00	(0.04)
Prop. of students with parental closure (std.)	0.09+	(0.05)	0.09+	(0.05)	0.01	(0.06)
Prop. of ethnic minority students (std.)			0.09	(0.09)	0.08	(0.09)
Prop. of students with a degree-educated parent (std.)			-0.05	(0.06)	-0.05	(0.06)
Interactions - school cohort parental closure X ethnic group						
White Other					0.09	(0.15)
Indian					0.27	(0.20)
Pakistani					0.00	(0.17)
African					0.38*	(0.17)
Caribbean					0.78***	(0.23)
Other					0.02	(0.13)
No ethnic group/Missing					0.08	(0.22)
Constant	0.54**	(0.20)	0.60**	(0.22)	0.53*	(0.22)
Level 2 variance	0.05***	(0.03)	0.05***	(0.03)	0.04***	(0.03)
BIC	4645		4660		4699	

*Note: + p<0.10, *p<0.05, **p<0.01, ***p<0.001 Controls in all models not shown here: female; age; cognitive ability test score; highest parental education; family structure, school stratum.*

Before considering the effects of the school cohort level variables included in model 5 and model 6, it is worth looking at the effects of ethnicity and the persistence of these effects on the importance of school marks once parental involvement measures are included. In Figure 11, the average marginal effects of ethnicity are considered in models 1 to 4.

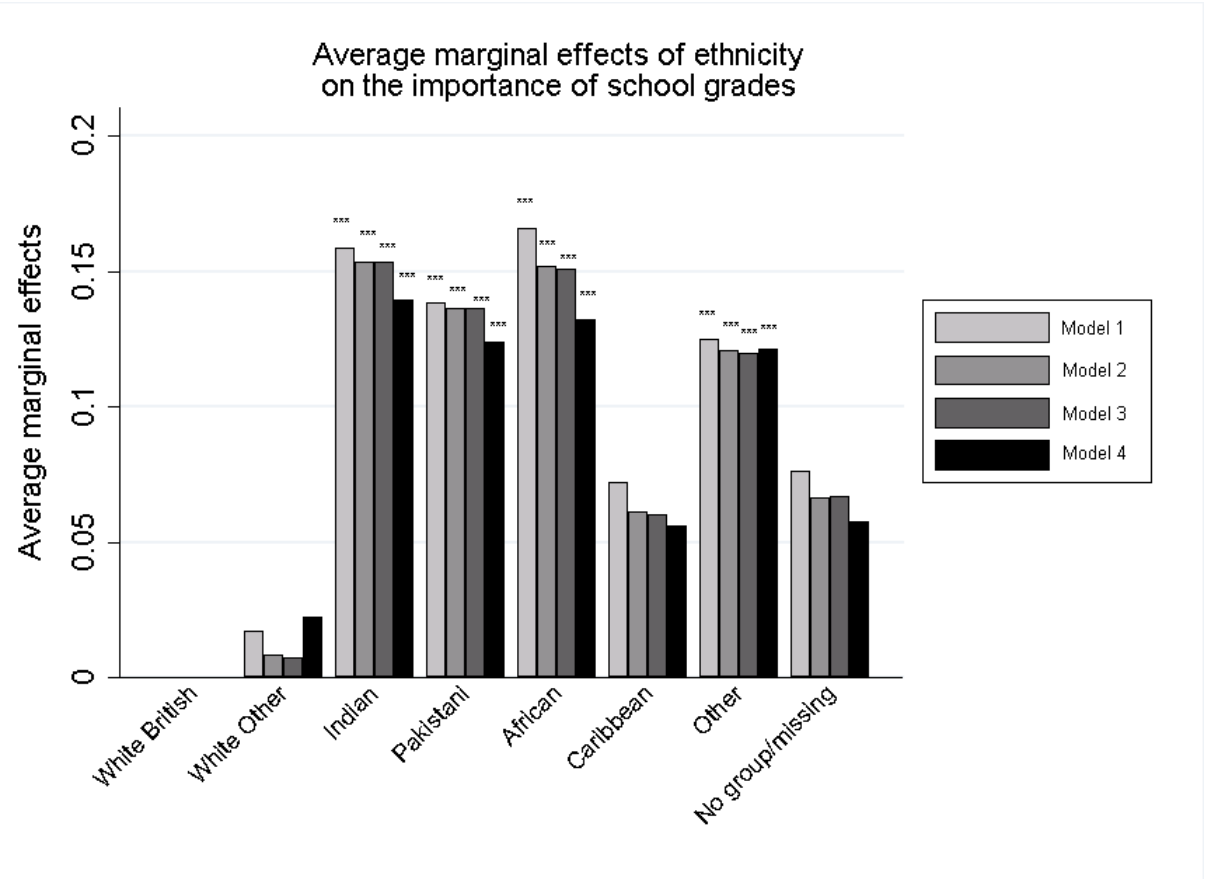


Figure 11 Average marginal effects of ethnicity on the importance of school marks

As can be seen, the significance of the effects of ethnicity for the Indian, Pakistani, African and Other groups are robust to inclusion of the parenting behaviour scales, the parental closure measure, and the other control variables. The educational advantages of these groups cannot be fully explained away by the family social capital used here, but the size of these ethnicity effects are, at least, somewhat reduced in size over models. In contrast, the effects of being from the Caribbean group or in the No ethnic group/Missing ethnic group category become insignificant between model 1 and model 2, suggesting that at least some of the ethnic differences in the likelihood of reporting that school marks are very important is due to individual level parental closure for these groups. In general, H4 is supported as controlling for individual level parental closure does result in the effects of ethnicity on the importance of school marks being reduced (albeit only slightly).

Turning now to model 5, the school cohort level measure of the proportion of students with parental closure is introduced and is found to be positive and significant. However, in model 6, the other two school cohort level composition controls are introduced and the school cohort parental closure effect becomes insignificant. H5 is not supported as school cohort level intergenerational social closure is not associated, net of individual-level closure and relevant cohort composition controls, with a higher likelihood of reporting that school marks are important. However, the introduction of the school cohort level measures in model 5 and model 6 results in increases in the BIC statistics for these models, indicating poorer model fit than in model 4.

In order to test H6 – that school cohort level intergenerational social closure will be associated, net of individual-level closure, with higher likelihoods of positive schoolwork attitudes and behaviours to differing extents across ethnic groups – interactions between the school cohort parental closure measure and individual ethnic group are needed. These interactions were carried out in model 7. There are two positive significant interaction effects for the Caribbean group and the African group. This suggests that the effects of school cohort closure do vary significantly across ethnic groups and so H6 is supported.

The coefficients in model 7 represent a change from 0% to 100% in the proportion of students in the school cohort with parental closure. This is a large change and so changes of more reasonable steps better show the nature of the effect. Figure 12 below shows these changes and how the effects of school cohort parental closure vary across ethnic groups. Only the slopes for the African and Caribbean groups are significantly different to that of the White British reference group. It is possible to infer from these results that for these two ethnic minority groups, belonging to cohorts with greater levels of parental closure is positively associated with improved schoolwork attitudes and behaviours even if students from these ethnic groups do not have individual level parental closure themselves. The

steeper slope and strongly significant result for the Caribbean group suggests that students from this ethnic group gain extra benefits from parental closure at the cohort level, which is relevant because the Caribbean group is often academically disadvantaged.

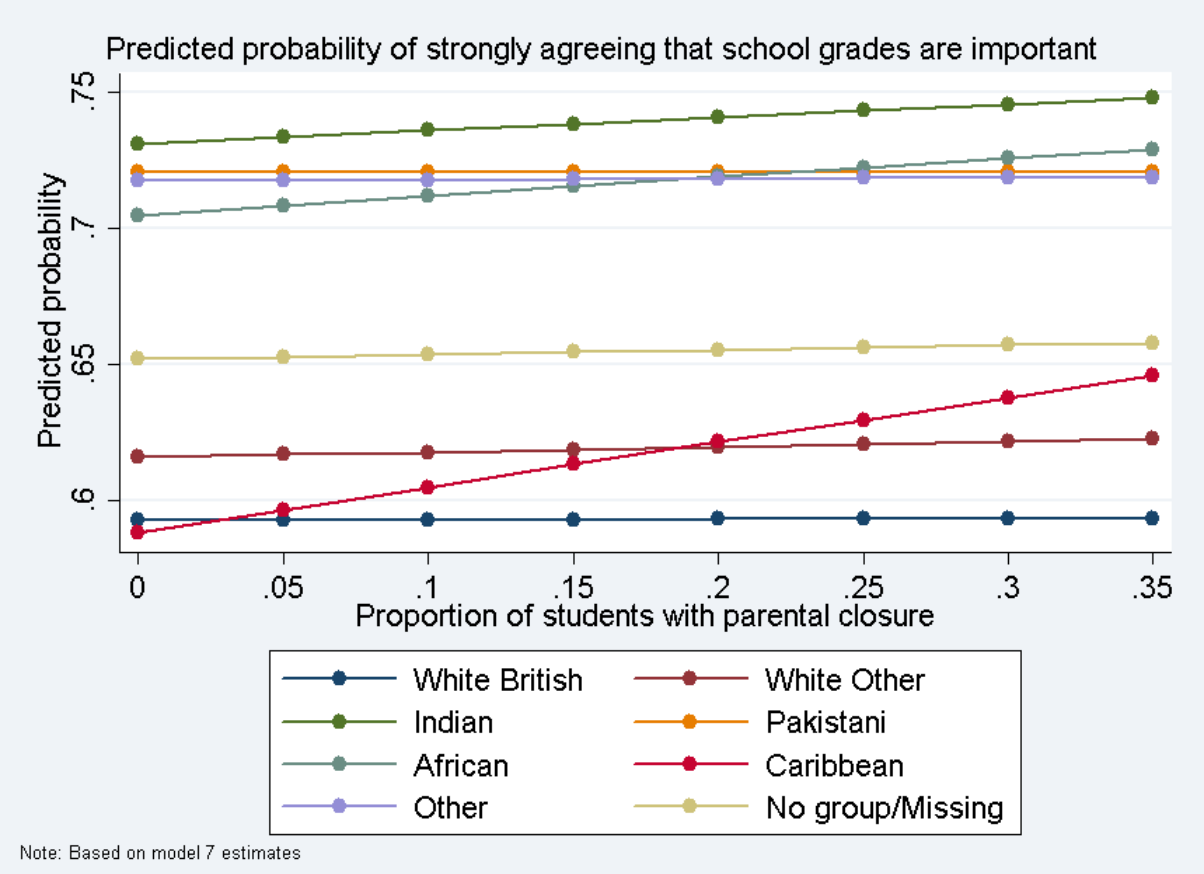


Figure 12 Predicted probability of strongly agreeing that school marks are important

Turning now to Table 14, results can be seen for the models predicting the likelihood of strongly agreeing that a great deal of effort is put into school work by the student. The same controls are included in all models as for the importance of school marks models.

Table 14 Logistic regression model predicting effort put into school work

	Model 1		Model 2		Model 3		Model 4	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Ethnic group (ref = White British)								
White Other	0.25	(0.17)	0.21	(0.17)	0.22	(0.17)	0.28	(0.18)
Indian	0.61***	(0.17)	0.58***	(0.17)	0.58***	(0.17)	0.58***	(0.17)
Pakistani	-0.07	(0.18)	-0.08	(0.18)	-0.08	(0.18)	-0.16	(0.19)
African	0.32+	(0.18)	0.24	(0.18)	0.24	(0.18)	0.24	(0.19)
Caribbean	-0.24	(0.25)	-0.29	(0.25)	-0.29	(0.25)	-0.37	(0.26)
Other	0.04	(0.16)	0.02	(0.16)	0.02	(0.16)	0.06	(0.17)
No ethnic group/Missing	0.40+	(0.22)	0.35	(0.22)	0.35	(0.22)	0.38+	(0.23)
Parental closure			0.57***	(0.12)	0.57***	(0.12)	0.24+	(0.14)
Parents know at least one classmate					0.03	(0.10)	0.00	(0.10)
All nominated friends from in school					0.03	(0.08)	-0.04	(0.09)
Parental encouragement scale (std.)							0.64***	(0.07)
Parental care scale (std.)							0.37***	(0.06)
Parental monitoring scale (std.)							0.19***	(0.05)
Parental severity scale (std.)							-0.09+	(0.05)
Constant	-1.97***	(0.22)	-2.01***	(0.22)	-2.04***	(0.24)	-1.98***	(0.25)
Level 2 variance	0.05***	(0.03)	0.05***	(0.03)	0.05***	(0.03)	0.03***	(0.03)
BIC	4043		4030		4046		3746	

	Model 5		Model 6		Model 7	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Ethnic group (ref = White British)						
White Other	0.28	(0.18)	0.28	(0.18)	0.23	(0.19)
Indian	0.57***	(0.17)	0.56**	(0.18)	0.61***	(0.18)
Pakistani	-0.16	(0.19)	-0.17	(0.19)	-0.10	(0.19)
African	0.26	(0.19)	0.25	(0.19)	0.34	(0.21)
Caribbean	-0.35	(0.26)	-0.36	(0.26)	-0.30	(0.30)
Other	0.07	(0.17)	0.06	(0.17)	-0.00	(0.18)
No ethnic group/Missing	0.39+	(0.23)	0.39+	(0.23)	0.32	(0.25)
Parental closure	0.27+	(0.14)	0.27+	(0.14)	0.26+	(0.14)
Parents know at least one classmate	-0.00	(0.10)	0.00	(0.10)	0.00	(0.10)
All nominated friends from in school	-0.04	(0.09)	-0.04	(0.09)	-0.05	(0.09)
Parental encouragement scale (std.)	0.64***	(0.07)	0.64***	(0.07)	0.64***	(0.07)
Parental care scale (std.)	0.38***	(0.06)	0.38***	(0.06)	0.38***	(0.07)
Parental monitoring scale (std.)	0.19***	(0.05)	0.19***	(0.05)	0.19***	(0.05)
Parental severity scale (std.)	-0.09+	(0.05)	-0.09+	(0.05)	-0.09+	(0.05)
Prop. of students with parental closure (std.)	-0.06	(0.05)	-0.07	(0.05)	-0.12+	(0.07)
Prop. of ethnic minority students (std.)			0.02	(0.09)	0.01	(0.09)
Prop. of students with a degree-educated parent (std.)			-0.01	(0.06)	-0.01	(0.06)
Interactions - school cohort parental closure X ethnic group						
White Other					0.31+	(0.16)
Indian					-0.04	(0.17)
Pakistani					-0.13	(0.18)
African					-0.02	(0.16)
Caribbean					0.01	(0.24)
Other					0.28+	(0.15)
No ethnic group/Missing					0.30	(0.22)
Constant	-2.03***	(0.25)	-2.02***	(0.27)	-2.03***	(0.27)
Level 2 variance	0.03***	(0.03)	0.03***	(0.03)	0.03***	(0.03)
BIC	3753		3769		3817	

*Note: + p<0.10, *p<0.05, **p<0.01, ***p<0.001 Controls in all models not shown here: female; age; cognitive ability test score; highest parental education; family structure.*

In order to limit repetition, results will only be discussed where they deviate from the results for the importance of school marks presented in Table 13. There are only three main differences in results worthy of note here.

A first interesting difference in results is seen in model 1, where ethnic differences are presented net of controls. Unlike for the importance of school marks, for school work effort the only three groups with a significant educational advantage relative to the White British group are the Indian group, the African group, and the No ethnic group/Missing ethnic group category. As such, the ethnic differences in this outcome are not so pronounced.

As with the importance of school marks results, H1 is again supported as individual level parental closure is associated with a higher likelihood of reporting high effort put into school work. H2 is again rejected as the inclusion of the friendship measures in model 3 does not appear to affect the parental closure measure.

The second key difference is with regards to the H3. Whilst H3 was supported for the importance of school marks outcomes, it is rejected for the schoolwork effort outcome. As can be seen in Figure 13, the average marginal effects of parental closure become insignificant in model 4. This suggests that effects of parental closure at the individual level are not robust to the inclusion of other measures of parental involvement and encouragement, leading to H3 being rejected.

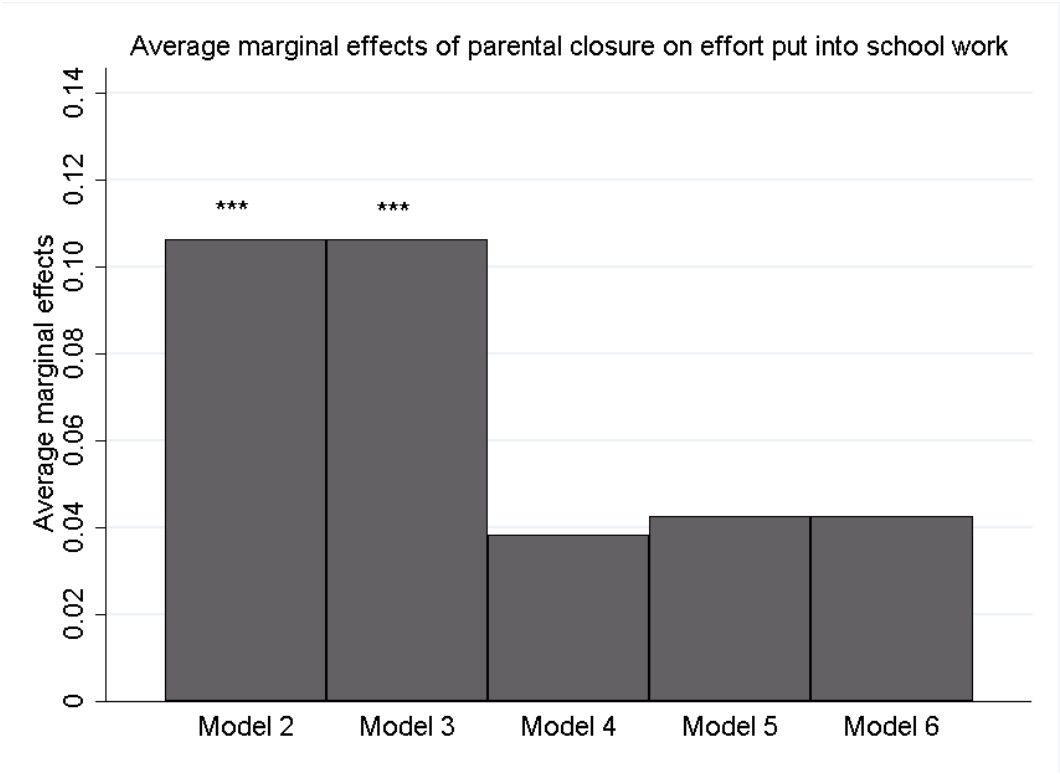


Figure 13 Average marginal effects of parental closure on effort put into school work

With regards to H4, Figure 14 suggests that the effects of ethnicity on effort put into schoolwork are reduced upon controlling for individual level parental closure. There is sufficient evidence to support H4 for all ethnic groups where the effects of ethnicity were originally significant in model 1. This means that H4 is again supported. This conclusion must be qualified though, as it is clear that the average marginal effects of ethnicity on effort put into school are for the most part insignificant even in model 1.

As can be seen in models 5 and 6 in Table 14, the school cohort parental closure effect is insignificant. In fact, all three school cohort measures are insignificant. This is consistent with the importance of school marks results, and means H5 is rejected for both outcomes. There is no support for school cohort level main effects of parental

closure, net of individual level closure effects and cohort composition controls, on schoolwork attitudes and behaviours.

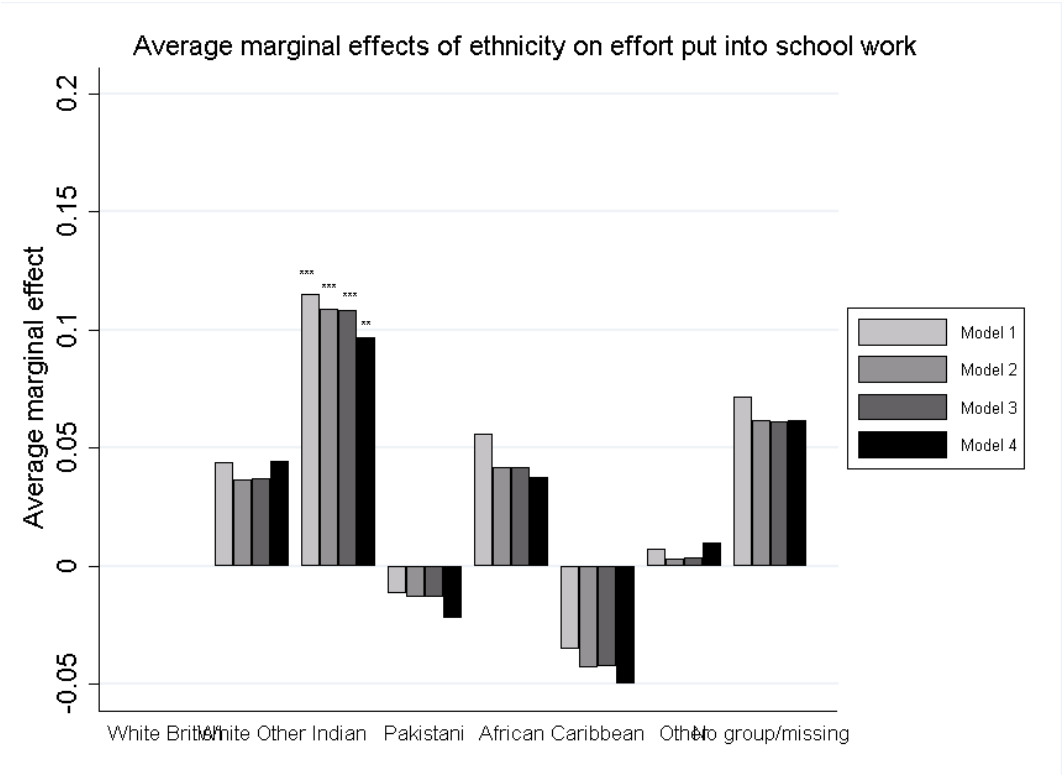


Figure 14 Average marginal effects of ethnicity on effort put into school work

The third key difference concerns model 7 and the interaction effects between school cohort level parental closure and ethnic group. Unlike for the importance of school marks outcomes, for schoolwork effort all interaction effects are insignificant. This suggests that there are no differences across ethnic groups in the (lack of) significant effects of cohort closure on effort put into schoolwork.

4.8 Conclusions

This thesis chapter investigated associations between schoolwork attitudes and behaviours and individual level and school cohort level parental closure. Data modelled from the English portion of wave 1 of the CILS4EU survey suggested that individual level intergenerational social closure was strongly and positively associated with both

the likelihood of reporting that school marks are important, and the likelihood of reporting that a great deal of effort is put into school work, but that these associations were not completely robust to the inclusion of other parental involvement and encouragement measures.

For effort put into schoolwork, there are no direct effects of individual level parental closure once measures of parental encouragement for school, parental monitoring of the student's activities outside of the home, parental provision of care and support, and parental strictness and severity are included in the model. For importance of school marks, however, there were some residual smaller effects of individual parental closure even once other individual parenting behaviours are controlled. Therefore the first main conclusion of this chapter is that there is some support for Coleman's theory of intergenerational social closure at the individual level for schoolwork attitudes, but not for schoolwork behaviours.

The second main conclusion is that there is very little evidence that parental social closure operates indirectly through parental influence on friendship. The size of the parental closure effects remained approximately the same size before and after controlling for parental knowledge of the child's classmates and the child having all nominated close friends from within school. This was the case when investigating both importance of school marks and effort put into school work.

The third main conclusion of this chapter is that there is no general support across ethnic groups for Coleman's theory of intergenerational social closure at the school cohort level. There were no significant robust associations (net of the effects of individual parental closure) between school cohort level parental closure and the schoolwork attitudes and behaviours investigated here.

However, there were significant positive interaction effects between ethnic group and school cohort level parental closure for the African and Caribbean groups for importance of school marks. This suggests that there is some (limited) support for Coleman's theory of intergenerational social closure at the school cohort level for these specific ethnic groups when considering schoolwork attitudes. This finding indicates that belonging to a closed social network may have benefits for children that may be distinct to those gained just from individual level parental closure. However, as controls for other school cohort level parenting behaviours were not included in the models, it is not possible to be sure that the contextual effects of cohort level closure for these ethnic groups are robust. Further, one must not forget that the main effect of school cohort level closure is not significant either for the schoolwork attitudes outcome or for schoolwork behaviours.

Nevertheless, the tentative school cohort level result for the African and Caribbean groups for schoolwork attitudes encourages one to speculate here on possible mechanisms for this effect. One such potential mechanism is that the pro-school norms, values, and expectations of relevant adults transmitted to some children within a closed social network are then also transmitted between children so that other students outside of the closed social network also experience the educational benefit. This posited transmission process may be especially influential upon the schoolwork attitudes for children belonging to the African and Caribbean ethnic groups, if one assumes that these ethnic groups are particularly susceptible to social contextual effects. This potential mechanism has not been tested in this chapter, and so further work needs to be done to see whether, and how, cohort level effects of parental closure operate.

One caveat and two more general points need to be raised in this discussion before it is complete. A caveat is needed concerning the finding of effects of individual level

parental closure. It is possible that any individual parental closure effects are indicators of broader family social capital, and especially the parental monitoring resources that are available to the student. The significant associations between the parental monitoring scale and the two outcomes of interest in this chapter suggest that some of the effects of parental closure may exist or operate through other more general parenting behaviours. As can be seen in the correlation matrix in Table 33 of the Appendix, there is a 0.37 correlation between the individual level parental closure measure and the parental monitoring scale, showing that these items are related and so that some of the "work" of parental closure may be being carried out by parental monitoring activities more broadly. Thus it is necessary to be cautious when concluding that there are effects of individual level social closure specifically, rather than parental monitoring behaviours more generally.

The first general point is that individual parental social closure by itself does not explain much of these ethnic differences in educational outcomes. It does appear that educationally advantaged ethnic groups are more likely to have parental closure, but rather than closure being the particular driver of the advantage, it appears that the more positive schoolwork attitudes and behaviours experienced by some groups can be better explained by family social capital and parenting behaviours more generally. However, even after considering parenting behaviours, some ethnic advantage does seem to persist, particularly for students belonging to the Indian ethnic group with regards to schoolwork behaviours, and for the Indian, Pakistani, African and Other ethnic groups with regards to importance of schoolwork attitudes.

The second general point is that it seems that measures of school attitudes and school behaviours are different to one another, with parental closure perhaps having more of an effect on attitudes rather than on behaviours. Perhaps it is the case that parental closure

can affect attitudes but not corresponding behaviours. The general ethnic gap between schoolwork attitudes and behaviours is worthy of attention; it is possible that ethnic differences in educational outcomes are not driven by cultural explanations of differences in the value of education across ethnic groups, but instead by differences in educational practices and the effort expended to reach educational targets. This ethnic gap needs further investigation.

Further work needs to be done to investigate the longitudinal nature of the associations found here. An even wider range of outcome behaviours needs to be explored, and the debate between intergenerational social closure as an individual level or school cohort level attribute still needs to be resolved as this thesis chapter has found effects at the individual level, but findings at the cohort level are weaker and restricted to two ethnic groups. Greater and more accurate parental involvement measures at the school cohort level would help resolve this issue, as would a more precise measure of intergenerational social closure as defined by Coleman in the first place. Data from a panel study would also help in further work through the provision of repeated measures. Finally, the mechanisms behind any parental closure effects need to be better understood and empirically tested, and the use of parental closure and other family social capital resources by different ethnic groups better explored, so as to understand how parental involvement and parent-child relationships provide educational advantages for some ethnic groups. Perhaps in this way lower performing ethnic groups can narrow the educational gap.

Chapter 5: Using individual and school cohort average duration of residence to explain variations in English language proficiency

5.1 Introduction

This thesis has so far explored the ethnic and poverty compositions of the school student body, the religious social context of the student body and the extended school community, and the monitoring and supervisory context of the extended school community. The aim in each of these past empirical chapters has been to determine whether the selected characteristics of the school social context contribute to explanations of interethnic differences in education. This fourth empirical chapter considers a new explanation for interethnic differences in education that has previously not been explored in this thesis – duration of residence[52] in the UK – and investigates its effect on English (L2) language proficiency.

Destination country (L2) language proficiency is an important issue for students of all ethnic groups as it is an essential requirement for success in the education system, and subsequently in the labour market. Proficiency in English, especially, is seen as a crucial factor in educational achievement and attainment (McLaughlin 1987; Kao and Tienda 1995; Portes and Rumbaut 2001). Aside from educational concerns, destination-country language acquisition is seen to be a key indicator of the integration of immigrants into society (Gordon 1964; Espenshade and Calhoun 1993) and an important component of accomplishment in the labour market (e.g. Dustmann and

[52] In this thesis chapter, age of arrival is considered to be equivalent to duration of residence in the destination country as the sampled cases are all a minimum of 14 and a maximum of 15 years old. The sample cases are from the same school year group and so duration of residence is the age of survey subtract age of arrival with a cap at 15 years.

Fabbri 2003; Berman et al. 2002). Similarly, the proficiency and use of origin-country languages (L1) are important indicators of the development and preservation of an ethnic social identity (Giles and Johnson 1981; Bourhis and Giles 1977), which may in turn have an effect on educational outcomes. In England, the diversity of immigrant groups and languages spoken is large, allowing for considerable variation in English and ethnic language use and fluency across different groups and generations. This makes the issue of English language proficiency extremely important and worthy of attention.

Duration of residence in the UK is relevant in this situation as all individuals who are born abroad and then subsequently migrate are categorised as first generation immigrants. This makes "first generation" a very broad category, encompassing everything from migration just after birth to migration in the last stages of life. As such, the duration of residence (duration of exposure) of first generation immigrants to the destination country varies greatly according to the age of arrival, but this variation is masked by the typical use of generation indicators. Rather than generation status, it is plausible that it is the differences in the duration of residence in the destination country that contribute to differences in educational outcomes. Duration of residence may affect educational outcomes through effects on destination country language (L2) proficiency. Individuals who arrive in the country at younger ages are likely to have had more time and opportunity to acquire and develop L2, which might provide them with an educational advantage compared to their similar peers who arrived at later ages and so have a shorter duration of residence. Similarly, students who arrived at later ages and so have shorter durations of residence may be more likely to have, and to use, an origin-country language (L1). The use of an L1 could potentially limit L2 proficiency. If there is systematic variation across ethnic groups in the average duration of residence the UK,

then ethnic differences in educational outcomes may really be explained by age of arrival and duration of residence differences in L2 proficiency.

Alongside individual level effects of duration of residence, there may also be school or school cohort level contextual effects of the average duration of residence of the student group. These contextual effects may be associated with educational disadvantages for all students in school cohorts and schools where greater proportions of students use origin country languages and have lower average durations of residence. This could be because, for example, schools with greater proportions of later arrival first generation immigrants have to allocate more resources towards the teaching these students. Therefore this chapter combines analysis of factors at the individual, school cohort and school levels to better understand their influence on a key educational outcome, English language proficiency.

This chapter makes use of cross-sectional data from the first wave in England of the recent Children of Immigrants Longitudinal Study in Four European Countries (CILS4EU) (Kalter et al. 2013) to investigate patterns of English language proficiency amongst adolescents. The study attempts to determine how individual duration of residence in the UK and L1 use, and school cohort average duration of residence and L1 language use, alongside other relevant school contextual effects[53], affect L2[54] language proficiency.

[53] As identified in chapter 3, the ethnic composition and socioeconomic composition of the school are significant predictors of educational outcomes.

[54] The English language is assigned to L2 because of the focus of this thesis on the educational differences experienced by ethnic minorities relative to White British students. It is acknowledged that for many students, and especially for White British students, L1 is actually English. However, for ease of terminology and labelling in this chapter, L1 will refer to the ethnic origin country language, and L2 will refer to English.

5.2 Previous research

Ethnic differences in academic outcomes have been long researched in the fields of ethnicity and education (see for example Heath et al. 2008; Heath and Brinbaum 2007; Ainsworth-Darnell and Downey 1998; Portes and MacLeod 1996). Differences in educational performance across ethnic groups are evident across most Western countries (for an overview see Heath and Brinbaum 2007) with the children of immigrants tending to perform relatively poorly compared to majority population children (Portes and MacLeod 1999; Levels, Dronkers et al. 2008). In the UK, some ethnic groups do out-perform the majority population, such as the Chinese and Indian groups (Rothon et al. 2009). Other ethnic groups, such as the Caribbean, Pakistani and Bangladeshi groups, tend to have lower average qualification levels than White British people, with the latter two groups particularly internally polarised i.e. disproportionate numbers of both high and low achievers (Modood 2003). Much of the educational disadvantage faced by ethnic minority students appears to be explained by the relatively low socioeconomic status of their first generation parents (Heath and Brinbaum 2007), but research in England and Wales suggests that substantial unexplained inequalities remain after controlling for social background (Rothon 2007). The extent of these inequalities varies across generations and is not necessarily linear. This is in contrast to straight-line assimilation theory (Gordon 1964), which predicts the assimilation of immigrants into the mainstream over the course of a number of generations. Given that there are persistent non-linear interethnic and intergenerational inequalities in education, it is important that the mechanisms by which these differences actually arise are identified.

One candidate for these unexplained inequalities is language proficiency. Both generation and language proficiency have been linked to immigrant adaptation in traditional and contemporary theories of assimilation (Watkins and Melde 2010).

Straight-line assimilation theory predicts greater L2 proficiency over generations and posits that third generation children have an advantage over second generation children because their parents are born and raised in the destination country and will be better equipped to live in the destination country society than first generation parents (Gordon 1964). Empirically, there is a clear pattern of changing L1 and L2 use over generations and ages of arrival, with a strong tendency for a decline in L1 use, in tandem with increasing L2 dominance, in the latter generations and earlier arrivals compared to earlier generations and later arrivals (Portes and Rumbaut 1990). Lieberson, Dalto and Johnston (1975) comment that there is an overwhelming preference for destination-country languages, especially English, among the second generation. This pattern of preference is evident regardless of the strength of first generation loyalty to the origin-country language, and has been found in second generation South Asians growing up in Canada, Australia, the US and the UK, although the degree of the preference does seem to vary across specific ethnic and religious groups (Ghuman 1998).

Aside from language preferences, it does seem clear that students who are not proficient in English are at a higher risk of falling behind or underperforming in school compared to their language proficient peers (e.g. Golash-Boza 2005; Portes and Schauffler 1994; Rumberger and Larson 1998). Modood (2003) suggests that Asian children typically come from homes where English is not spoken and so are often behind their White British and Caribbean peers when they begin school. As Asian children develop their skills in L2, they catch up, and then even overtake, their non-Asian peers. The evidence for this is mixed however, as while the Indian group does well in school, the Bangladeshi and Pakistani groups lag behind. One explanation for the success of the Indian group is their typically higher socioeconomic status relative to the Pakistani and Bangladeshi groups (Rothon 2007). A competing explanation is that compared to Indian

students, Pakistani and Bangladeshi students experience a delay in L2 acquisition because of their greater likelihood of first generation migrant status and a lower average duration of residence in the UK. It is noted that the school performance of Pakistani and Bangladeshi students' improves 'once they become proficient in English' (OFSTED 1999: 7). Thus it is plausible that ethnic differences in education arise because of language differences, at least amongst the Asian groups. Such evidence supports the importance of determining the factors that contribute to L2 acquisition, whilst evidence that fluent bilingual pupils outperform their monolingual peers (e.g. Lutz and Crist 2009; Golash-Boza 2005; Portes and Hao 2002; White and Glick 2000; Fernandez and Nielsen 1986; Demie and Strand 2006) suggests that L1 maintenance is also useful for the educational performance of young people.

5.3 Age-based explanations for differences in language proficiency

There are various socio-linguistic theories that attempt to explain these patterns of language preference and proficiency - specifically, these theories posit explanations for destination-country language (L2) acquisition and origin-country language (L1) attrition. The term attrition[55] is used here to describe the intergenerational loss in language competence (Major 1993; Andersen 1982). The first theory suggests that age is the critical factor in language acquisition and attrition. Proponents of this theory argue that the younger the child is when she or he moves to a new language environment, the more rapid and intense the L1 language attrition and L2 language acquisition (e.g. Schmid 2002; de Bode 1996; Isurin 2000). The age at which learners are first exposed to a language is a major predictor of their long-term success in the

[55] Language attrition is frequently accompanied by language shift, which describes an intra-generational movement from the use of L1 to L2.

language (Long 2004). Other authors have found that duration of residence in the host country has the strongest correlation with English fluency, and that there is also a strong relationship between national origin and fluency in a minority language (Portes and Schauffler 1994). Much additional evidence also suggests negative associations between age at migration and language proficiency[56] (e.g. Ramsey and Wright 1974; Patkowski 1980; Stevens 1999; Birdsong 1992). In the data used for this analysis, age at migration and duration of residence are essentially the same thing as the sample is of one same-age school cohort. This leads to an uncontroversial first hypothesis.

H1: the longer that students have been living in the UK, the higher their L2 test scores.

H1 invites the consideration of the possibility of contextual effects of duration of residence. School cohorts and schools with a lower average duration of residence of students may have more students with weaker L2 skills and stronger L1 skills, resulting in lower L2 proficiency for all students because of less exposure for all students to higher quality L2 use. This leads to a more innovative hypothesis, based on extrapolations from the predictions of H1.

H2: the greater the average duration of residence of students in the school cohort, the higher their L2 test scores.

5.4 Usage-based explanations for differences in language proficiency

The second set of theories focus on L1 use and contact. These theories examine how sources of contact in L1 and opportunities to use L1 determine the rate of L1 attrition and L2 acquisition. Opportunities for both L1 and L2 language contact within the social

[56] Considered the other way around, associations are positive between duration of residence and language proficiency.

context of the individual language learner should not be overlooked. For example, Köpke and Schmid (2004) emphasise the point made by earlier linguistics researchers that attrition cannot be studied separately from the social context in which it occurs. Equivalently, 'a child's development of linguistic competence is an outcome of…the activities in which children routinely interact with others' (Ochs and Schieffelin 1995: 91). Within this second set of theories, researchers speculate that language attrition results when languages come into contact with each other (e.g. Seliger 1996; Sharwood Smith and van Buren 1991). Extrapolating from this idea, L2 language acquisition and proficiency may be hindered by the presence of language alternatives, such as the existence of an L1.

H3: students who have an L1 have lower L2 test scores than students who do not have an L1.

There is long-standing evidence to support the theory that language contact and use is linked to language proficiency, with more use of, and exposure to, a language being linked to increased proficiency (e.g. Stevens 1999; Ramsey and Wright 1974; Scherer and Wertheimer 1964). In a recent paper, Hulsen and colleagues (2001) find evidence of non-linear linguistic contact effects. In their investigation of the relationship between the number of L1 speakers in a neighbourhood and L1 attrition, they found that larger numbers of L1 contacts did not necessarily correspond linearly to higher L1 test scores. This study suggests that there may be contextual effects of L1 use in addition to individual level effects. It is plausible that in situations where there are greater proportions of L1 users, overall exposure to L2 is reduced, and so L2 proficiency is decreased. This is based on the expectation that contextual level effects will be in the same negative direction as individual level effects.

H4: students belonging to school cohorts with greater proportions of L1 users have lower L2 test scores.

5.3 Contribution to the field

This study contributes to the field in a number of ways. The focus of the topic is highly relevant. It is necessary to understand what determines L2 language proficiency because it is a key indicator of integration (Gordon 1964), and is needed for educational and occupational success in the destination-country. For example, Demie and Strand (2006) find that there are serious disadvantages in educational attainment associated with low levels of L2 fluency among pupils studying in England. As the ethnic composition of England's population continues to evolve, it is a key priority to investigate where and how young ethnic minority individuals fit into society and which pathways of language and educational integration (or segregation) they are on. Investigating and appreciating patterns of language proficiency is one way in which to improve contemporary understanding of the attitudes and experiences of ethnic minority individuals living in England today.

Data from the third migrant generation is included in the analysis, which contributes to the literature as this generation is only recently beginning to be observed in countries such as Britain (Alders and Keij 2001). Further, detailed information on age of arrival within a sample of the same age avoids problems of conflating duration of residence effects with age of immigration effects – in this analysis they are essentially one and the same. However, this relies on the (not necessarily valid) assumption that there is no differential immigrant selectivity across school cohorts i.e. that earlier and later arrivals are fully comparable and that the members of the non-first generations (of the earlier

school cohorts) all started at similar positions along the assimilation pathway (Becker 2011).

Ethnic background has been found to be a strong predictor of educational outcomes even after controlling for socioeconomic background (e.g. Rothon et al. 2009). Alongside a more accurate classification of generation, this study classifies ethnic grouping with greater accuracy rather than a simple White British/non-White British divide. Using combined information on the student's country of birth and parents' countries of birth, in tandem with students' self-reports of ethnic group belonging, allows a more flexible assignment of ethnic identity than the standard Census categorisation. This enables a better understanding of the impact of ethnicity over and above that of duration of residence and language proficiency. Investing the duration of residence within the broader first generation classification also helps reveal interesting intra-ethnic first generation variations.

5.4 Methods

The data for this study comes from the English portion of wave 1 CILS4EU. This comprises initial data from 4,315[57] fifteen year old students attending 107 schools in England. The students were all in Year 10 during the academic year 2010-2011. The school sample was chosen using a stratified random sampling method, with stratification taking place according to the ethnic density of schools[58]. Two mixed ability classes were interviewed in most schools with a mean of 40.1 students

[57] The original sample contained 4,427 cases but 112 of these cases were absent from school when the survey was administered and so were excluded from the sample.

[58] Stratum 1 included schools with 0-10% of the student population being of ethnic minority origin; stratum 2 included schools with 10-30% ethnic minority students; stratum 3 included schools with 30-60% ethnic minority students; stratum 4 included schools with 60-100% ethnic minority students.

interviewed per school[59]. Students completed an individual questionnaire, an in-class social networks module, a survey about their 5 best friends, a non-verbal reasoning cognitive ability test, and an English language test.

Cases were excluded from the analysis if they were lacking information on any of the independent variables of interest or on the main dependent variable. A relatively large number of cases (161) were removed as they lacked information on the dependent variable (English language test score). Students missing information on gender (9 cases) were removed from the analysis. A further 20 cases were excluded where the student reported an age other than 14 or 15[60]; 80 cases were dropped where no age was reported. Information on parental education was deemed vital because of the strong links between parental education levels and child educational outcomes (Blau and Duncan 1967; Featherman and Hauser 1978) and so missing parental education information was stored in a separate "missing" category in order to keep these cases in the analyses. A further 206 cases were dropped because of missing or unclassifiable ethnic background information[61]. The 65 cases who did not report whether an additional (L1) language was used in the home were also excluded. Finally, 42 cases where there was no information on the age of arrival or duration of residence in the UK were dropped. After these 787 cases were excluded, data on 3,732 students in 106 schools remained for analyses. Descriptive statistics for variables used in this chapter and a correlation matrix can be found in Table 37, Table 38 and Table 39 in the Appendices. The distribution of the sample can be seen in Table 15 and Table 16 below.

[59] Standard deviation of number of pupils interviewed in schools is 9.17(2.d.p.). The maximum number of students interviewed in a school was 60; the minimum number was 12.
[60] Nine students reported being 13; ten students reported being 16; one student reported being 17.
[61] More information on how ethnic background was determined is provided later in this section.

Table 15 Descriptive statistics of sample by sex, ethnicity and years of residence

Ethnic group	Male				Female				Total			
	N	**%**	**Mean**	**S.D.**	**N**	**%**	**Mean**	**S.D.**	**N**	**%**	**Mean**	**S.D.**
White British	1178	76.6	14.4	0.5	1122	79.2	14.4	0.5	2300	77.9	14.4	0.5
White Other	100	3.3	8.1	5.4	91	3.4	8.4	5.1	191	3.3	8.2	5.2
Indian	114	3.0	13.2	2.8	93	2.6	13.5	3.0	207	2.8	13.3	2.9
Pakistani	151	4.0	12.8	3.8	116	3.0	13.4	3.1	267	3.5	13.1	3.5
Asian Other	92	3.4	11.2	4.5	84	3.2	9.6	6.0	176	3.3	10.4	5.3
African	155	4.6	11.6	4.3	149	4.4	11.6	4.6	304	4.5	11.6	4.4
Caribbean	55	1.7	13.1	3.4	63	1.9	12.4	4.0	118	1.8	12.8	3.7
Other	94	3.5	9.6	4.9	75	2.2	9.4	4.6	169	2.9	9.5	4.8
Total	1939	100.0	13.2	3.2	1793	100.0	13.2	3.3	3732	100.0	13.2	3.2

Note: Weighted percentages; unweighted Ns and statistics.

Table 16 Descriptive statistics of L2 test score

Ethnic group	Male		Female		Total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
White British	17.4	3.4	17.3	3.3	17.3	3.3
White Other	14.7	5.2	15.6	4.6	15.1	5.0
Indian	18.2	2.7	17.4	3.7	17.8	3.2
Pakistani	15.8	3.8	15.9	3.4	15.8	3.7
Asian Other	16.6	3.4	16.2	4.1	16.4	3.8
African	16.7	3.8	16.4	3.7	16.6	3.7
Caribbean	16.9	3.5	16.8	3.6	16.8	3.5
Other	16.2	4.9	16.9	3.9	16.5	4.5
Total	17.0	3.7	17.0	3.5	17.0	3.6

5.4.1 Duration of residence

Much of the literature on migration investigates the variation of effects over generations, such as the differential labour market outcomes of first generation immigrants compared to the second generation, third generation and so on. More recently, the relevance of 'decimal' generation[62] distinctions was emphasised by Rumbaut (1997). Rumbaut's argument that members of the first generation should be distinguished according to age of arrival so as to create the 1.25^{th}, 1.5^{th} and 1.75^{th} generations causes difficulties for the traditional conceptualisation of generation,

[62] This finer classification of generation makes it possible to categorise students within more detailed specifications of generation i.e. the first generation can be sub-divided into the 1.25^{th}, 1.5^{th} and 1.75^{th} generation (reflecting immigration after the age of ten, between the ages of six and ten, and before the age of five respectively). Similarly, a 2.5^{th} generation can be defined within the broader 2^{nd} generation to include those individuals with one first generation parent and one non-first generation parent. The larger number indicates the greater exposure at the family level to the destination-country culture for the 2.5^{th} generation compared to the 2^{nd} generation. Note, however, that the non-first generation parent is not necessarily of the ethnic majority group – the only requirement is that the non-first generation parent is born in the destination-country.

however, as it conflates individual-level duration of exposure to the host country with family-level duration of exposure. Further, categorising students by age of arrival into generational groups in this way collapses more detailed age of arrival information into less detailed broader generation categories. As such, this chapter considers the role of individual-level duration of exposure to the host country (captured by duration of residence in years in the UK) rather than the exposure at the family-level that would typically be captured in the pre-Rumbaut concept of generation.

The effects of duration of residence on educational outcomes may not necessarily be linear. In order to look at the pattern of association between duration of residence and L2 test score, a non-parametric LOESS[63] regression model (Cleveland and Devlin 1988) of L2 test score on duration of residence was estimated on the sample. The graphical results of the LOESS smoother can be seen in Figure 15 below. The results suggest a positive and approximately linear trend between the two variables. As such, no transformations of the duration of residence variable (such as a logged term or a quadratic term) were included in the model.

[63] LOESS models were developed by Cleveland and Devlin and follow a locally weighted polynomial regression method. In this method, subsets of the data are analysed in turn. In each subset, low order polynomial functions are fitted to each point within the subset, with the points around the current estimation point weighted according to their nearness to the current estimation point. In this way, LOESS models allow flexibility as no single prior determined function is needed to fit the model to all of the data. Rather, multiple functions are fitted to subsets of the data, resulting in a model that approximates the curve of best fit. This is in contrast to the straight line of best fit produced by linear regression.

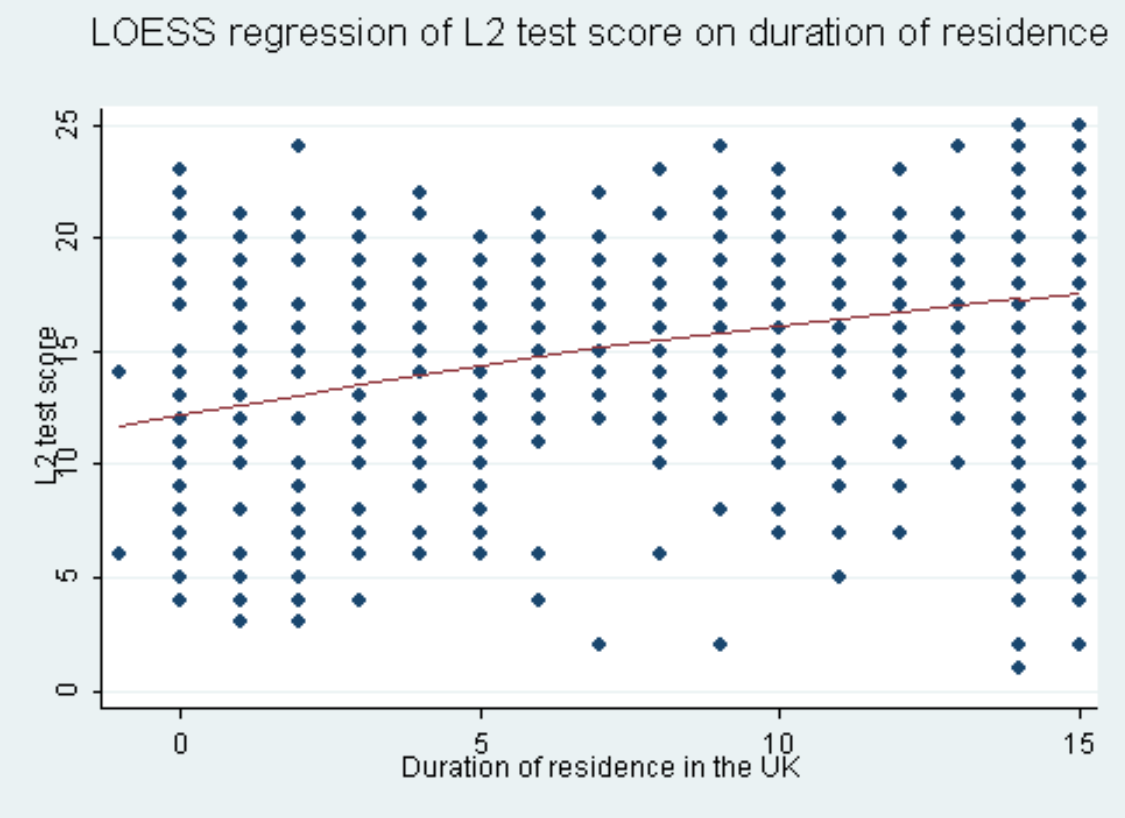


Figure 15 LOESS smoother regression of L2 test score on duration of residence

It is important to acknowledge that it is not necessarily the case that age of arrival is equivalent to age of first exposure to L2 (Long 2004). In some cases, individuals may have already had some exposure to L2 before migration, whereas in other cases, life after migration may continue to take place in a predominantly L1 community. Thus individuals with similar lengths of residency may in fact have different levels of L2 exposure. This is particularly relevant when comparing the ethnic minority second generation with the White British majority population, as in both cases the objective age of arrival is zero. In order to simplify the interpretation of the results of this study, however, it is assumed that individuals who arrived in the UK at the same age have experienced the same level of L2 exposure. Differences according to ethnicity are captured using ethnic background dummy variables.

5.4.2 Independent variables

The independent variables in the analysis included in all models were standard socio-demographic controls for age[64]; gender; mother's highest completed educational qualification[65]; father's highest completed educational qualification; cognitive ability test score (standardised); and ethnic origin. A set of dummy variables indicating the ethnic density strata of the school[66] were also included in all models to adjust for the over-sampling of students attending ethnically dense schools and to test for school ethnic contextual effects. This set of dummies also included an indicator of whether or not the school was an independent school. A school cohort-level measure of the standardised proportion of students with a university educated parent was included in the final model to test for school cohort socioeconomic contextual effects.

5.4.3 Ethnic origin variable

Ethnic origin was constructed using a four stage process. Firstly, students born abroad were allocated to ethnic origin groups based on their region of birth. Secondly, the remaining 2nd and 2.5th[67] generation students were allocated based on the region of birth of their parents. If either parent was born abroad, the student was allocated to the corresponding non-White British ethnic origin group. Where there were differences in the regions when both the mother and the father were born abroad, then the student was allocated to the mother's region. Thirdly, the 3rd+ generation were allocated to ethnic

[64] The student's age is a derived variable based on the year of survey subtracted from the student's year of birth.
[65] Highest completed educational qualifications were coded as none, primary (or equivalent), secondary (or equivalent), tertiary (or equivalent), and missing. This was the same for both mothers and fathers.
[66] The ethnic density strata of the school sampling frame were used for these dummies. See footnote 29.
[67] The 2.5th generation includes those individuals with one first generation parent and one non-first generation parent.

origin groups using their response to an ethnic belonging question[68]. Fourthly, any remaining students were allocated to ethnic groups according to the ethnic language they reported speaking at home. Ethnic groups with small numbers were combined into one group. This resulted in eight broad ethnic origin groups: White British, White Other, Indian, Pakistani, Asian Other, African, Caribbean, and Other. This categorisation correlated significantly with the ethnic belonging measure. The White British group was chosen as the reference category because of its size and because the White British majority group is typically used as a reference group in ethnicity research. Strength of ethnic identity was not included in the analysis due to limited response to this question.

5.4.4 Duration of residence and L1 use variables

Alongside these variables, duration of residence in the UK was included and calculated as the age of migration of the student subtracted from the student's age. Students who reported being born in the UK were coded with a zero age of migration, giving them the maximum possible duration of residence relative to their age. A dummy variable was included to indicate the existence of an L1 in the home (measures of the frequency of use were not included). Both these variables were aggregated to the school cohort level to test for contextual effects of duration of residence and L1 use.

All aggregated and school cohort-level variables were standardised to ease interpretation.

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[68] Students were asked which group(s) they felt they belonged to and presented with a list of ethnic categories and an "other" category where they could record an open response. This question was not used as the main determinant of ethnic origin due to greater difficulties in interpreting student's responses compared to the clearer measures of country of birth and parents' countries of birth.

5.4.5 Dependent variables

The dependent variable in the analysis was English language test score[69]. Students participating in wave 1 of CIL4EU in England sat a 25 question multiple choice synonym test designed by the members of the survey team. Each question had 5 answer choices and students had to identify the answer item that was a synonym of the question item amongst the answer options. Test scores ranged from 0 to 25. Means and standard deviations of test scores by ethnic group can be seen in Table 16 on page 216.

5.5 Results

Table 17 shows multilevel linear regression models predicting L2 test score. In all models, control variables for sex, age, mother's highest educational qualification, father's highest educational qualification, and school stratum are included. There are 3,730 students from 107 schools in all models.

The effects of the control variables are mostly insignificant. Students attending independent schools score significantly higher on the language test. The only other significant effects come from mother's and from father's highest educational qualification (students with mothers with higher levels of education qualifications all score significantly higher than students with mothers possessing no educational qualifications; the same applies for fathers and there is no significant difference between the reference category of no education and the missing educational qualifications category for both mothers and fathers). The control variables behave as expected and are consistent across models. As such, the coefficients for these covariates were controlled for but not displayed in all models in Table 17.

[69] The English language test was administered at the time of the survey and in timed examination conditions.

Model 1 shows ethnic differences in L2 test score subject to the four controls detailed above. Apart from the Indian group, all other ethnic groups achieve lower scores than the White British reference group. The White Other, Asian Other, African, and Other Ethnicity groups score significantly lower. In model 1 the between school (level 2) variance is significant, but is much smaller than the within school (level 1 variance). This suggests that most of the variation in L2 test score lies at the individual level rather than the school level.

Cognitive ability test score is controlled for in model 2. The previously significant African coefficient becomes insignificant once ability is included in the model. The White Other coefficient remains very similar to the estimate in model 1; the coefficients for the Asian Other and Other ethnicity categories both increase in size, suggesting a further linguistic disadvantage for students belonging to these groups once cognitive ability is considered alongside the socio-demographic control variables.

The introduction of individual duration of residence in model 3 reduces all previously significant ethnic coefficients to insignificance, indicating that much of the L2 test score disadvantage experienced by most ethnic groups is explained by the typically shorter duration of residence of the sampled members of these groups. This is unsurprising as a duration of residence lower than 14 indicates that the student is a first generation migrant. The lower the duration of residence, the greater the number of years the student has spent in another country, where English was potentially not used or taught. As such, this finding that each additional year increase in the duration of residence is significantly associated with 0.27 increase in L2 test score supports the age of arrival theory presented earlier (e.g. Schmid 2002; de Bode 1996; Isurin 2000). H1 is not rejected as the greater the duration of residence, the higher the L2 test score.

Of additional interest in model 3 is the Indian coefficient, which increases and becomes significant between model 1 and model 2, suggesting that once duration of residence is controlled for, Indian students have an educational advantage when it comes to L2 test score. This could be because Indian first generation migrants have learnt English in their schools in India, and so are not at such a disadvantage. Indian parents may also be more likely to speak English because of their greater likelihood of middle class origin. The African, Caribbean, and Other Ethnicity group coefficients also switch signs from negative to positive, suggesting that once cognitive ability and duration of residence are considered, these groups are performing as well as the reference group. The between school variance becomes smaller and loses significance to only the 0.05 level. The variance at level 1 remains highly significant but is reduced.

Model 4 introduces an indicator of the use of an additional language (L1) at home. This coefficient is significant but only at the 0.10 level, which means H3 is rejected – students who report the use of an L1 at home do not achieve significantly lower L2 test scores than students who do not report an L1. However, both the increase in the BIC value and the lack of a reduction in level 1 variance between model 2 and model 3 suggest that the inclusion of the additional language at home measure does not make a strong contribution to the explanation of variation in L2 test score. The Indian coefficient increases in size again, suggesting that Indian students have an even greater L2 test score advantage once their L1 use is also taken into account. The same is true for students of African origin.

Table 17 Multilevel linear regression models predicting L2 test score

	Model 1		Model 2		Model 3		Model 4	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Ethnic group (ref = White British)								
White Other	-1.69***	(0.25)	-1.68***	(0.23)	-0.09	(0.25)	-0.00	(0.27)
Indian	0.14	(0.26)	0.05	(0.25)	0.47*	(0.24)	0.57*	(0.27)
Pakistani	-0.26	(0.25)	-0.22	(0.23)	0.05	(0.22)	0.15	(0.26)
Asian Other	-0.96***	(0.26)	-1.14***	(0.24)	-0.09	(0.25)	-0.00	(0.27)
African	-0.54*	(0.21)	-0.31	(0.20)	0.38+	(0.20)	0.44*	(0.21)
Caribbean	-0.17	(0.31)	-0.01	(0.29)	0.40	(0.28)	0.42	(0.28)
Other	-0.86**	(0.27)	-0.91***	(0.25)	0.34	(0.26)	0.39	(0.27)
Cognitive ability (std.)			1.40***	(0.06)	1.37***	(0.06)	1.37***	(0.06)
Duration of residence in the UK					0.27***	(0.02)	0.27***	(0.02)
Has an additional language (L1)							-0.14	(0.17)
Constant	14.93***	(0.66)	16.57***	(0.61)	13.28***	(0.62)	13.34***	(0.63)
Level 2 variance	1.48*	(0.25)	0.87	(0.16)	0.63*	(0.13)	0.63*	(0.13)
BIC	19522		18984		18785		18792	

Model 5 introduces the first of the contextual level 2 predictors. The average duration of residence of students in the school cohort is significant and is of an equivalent size to the individual level effect of age of arrival. This finding means H2 is not rejected – the greater the average duration of residence of students in the school cohort, the higher the L2 test score. The variance at level 2 is reduced slightly.

Model 6 shows that there is no significant effect of percentage of L1 users in the school cohort. This is not in accordance with the individual level finding of a negative effect of having an additional language seen in model 3. This finding leads to H4 also being rejected - students belonging to school cohorts with greater proportions of L1 users do not have significantly lower L2 test scores. There does not appear to be a spill-over effect of L1 use in the school cohort.

	Model 5		Model 6		Model 7		Model 8	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Ethnic group (ref = White British)								
White Other	-0.01	(0.27)	-0.02	(0.27)	0.00	(0.27)	0.26	(0.29)
Indian	0.53+	(0.27)	0.52+	(0.27)	0.52+	(0.27)	0.66*	(0.28)
Pakistani	0.14	(0.26)	0.13	(0.26)	0.20	(0.26)	0.25	(0.27)
Asian Other	0.01	(0.27)	0.00	(0.27)	0.00	(0.27)	0.13	(0.30)
African	0.46*	(0.21)	0.45*	(0.21)	0.46*	(0.21)	0.33	(0.22)
Caribbean	0.42	(0.28)	0.42	(0.28)	0.42	(0.28)	0.45	(0.29)
Other	0.39	(0.27)	0.39	(0.27)	0.35	(0.27)	0.30	(0.30)
Cognitive ability (std.)	1.36***	(0.06)	1.36***	(0.06)	1.35***	(0.06)	1.35***	(0.06)
Duration of residence in the UK	0.26***	(0.02)	0.26***	(0.02)	0.26***	(0.02)	0.26***	(0.02)
Has an additional language (L1)	-0.14	(0.17)	-0.14	(0.17)	-0.15	(0.17)	-0.17	(0.17)
Avg. duration of residence of cohort (std.) (A)	0.31**	(0.10)	0.32**	(0.11)	0.22*	(0.10)	0.29*	(0.12)
Prop. students with an L1 in cohort (std.)			0.08	(0.18)	-0.04	(0.16)	-0.03	(0.16)
Prop. students with a degree-educated parent (std.) (B)					0.57***	(0.10)	0.57***	(0.11)
Interactions – ethnic group X contextual effect								
White Other x (A)							0.57**	(0.19)
Indian x (A)							0.05	(0.28)
Pakistani x (A)							0.26	(0.21)
Asian Other x (A)							0.08	(0.20)
African x (A)							-0.09	(0.15)
Caribbean x (A)							0.24	(0.25)
Other x (A)							0.32+	(0.18)
White Other x (B)							0.83***	(0.24)
Indian x (B)							0.28	(0.25)
Pakistani x (B)							0.57*	(0.24)
Asian Other x (B)							0.08	(0.25)
African x (B)							0.55*	(0.22)
Caribbean x (B)							0.69*	(0.34)
Other x (B)							0.82***	(0.24)
Constant	13.22***	(0.62)	13.30***	(0.65)	13.62***	(0.64)	13.62***	(0.65)
Level 2 variance	0.57**	(0.12)	0.57**	(0.12)	0.38***	(0.09)	0.39***	(0.09)
BIC	18792		18800		18778		18871	

*Notes: + p< 0.10, *p < 0.05, ** p <0.01, *** p < 0.001. Controls included in all models but not shown here: sex, age, mother's highest education, father's highest education, school stratum.*

The final contextual level predictor measuring cohort socioeconomic composition is included in model 7. The percentage of students in the school cohort with at least one parent educated to degree level significantly predicts increases in L2 test score. . However the effect of the average duration of residence of students in the school cohort remains significant, and is not reduced in size. All ethnic coefficients are insignificant apart from the African coefficient, which remains significant and positive once contextual factors are considered.

Two of the four contextual factors under investigation were found to be significant beyond the 0.10 level. Figure 16[70] below shows the relative[71] effect sizes of these two contextual factors for each ethnic group.

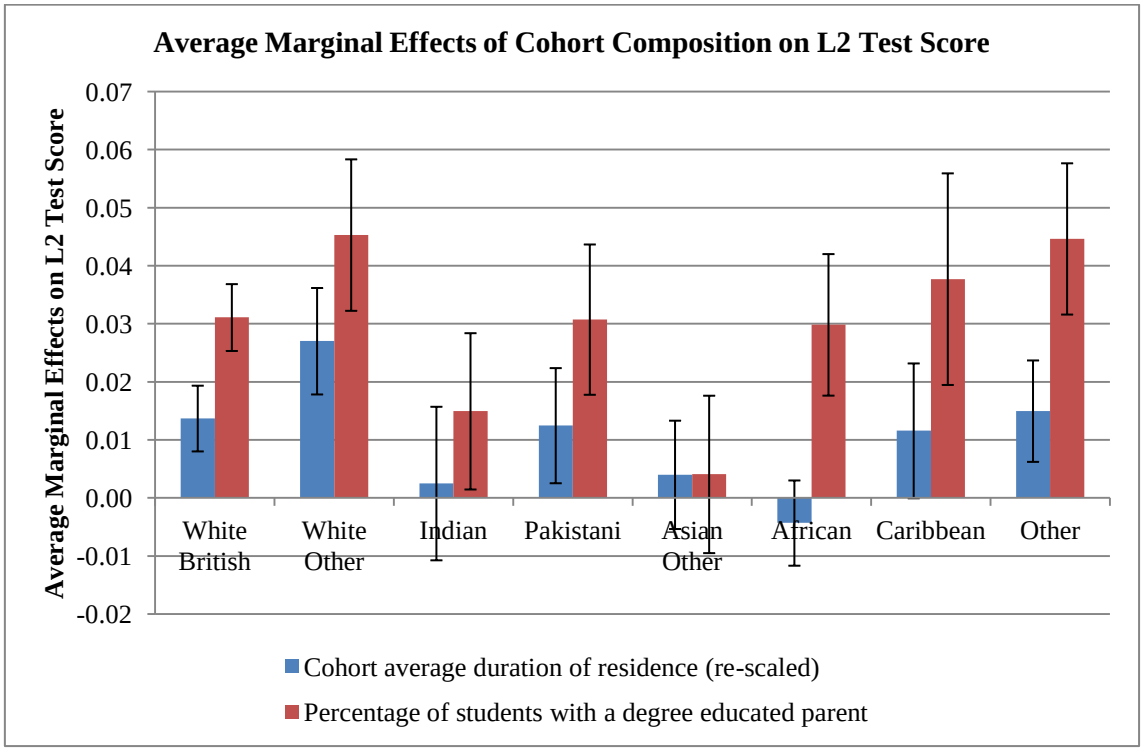


Figure 16 Average marginal effects of school context on L2 test score

[70] Figure 16 is based on model estimates that include interaction effects between ethnic group and each of the two contextual variables of interest. These estimates can be seen in model 8 in Table 40 in the Appendices

[71] The average duration of residence variable has been rescaled here and in Figure 17 so that it ranges from 0 to 100. This is so that effects can be compared across the two variables.

It is clear that ethnic groups are differentially affected by each contextual factor, as seen by the differences in bar heights once ethnic group and contextual factor are interacted together. However, in general the effect of the percentage of students with a degree educated parent in the school cohort is much larger than the effect of the school cohort average duration of residence. The White British, African, and Other groups are significantly positively affected by the percentage of students with a degree educated parent in the school cohort, whilst the Indian and Asian Other groups are notable because of the small (and mostly insignificant) size of both contextual effects. This differential resilience to the school context may help explain some of the ethnic advantage experienced by the Indian group, but not so much of the ethnic disadvantage experienced by the Asian Other group[72].

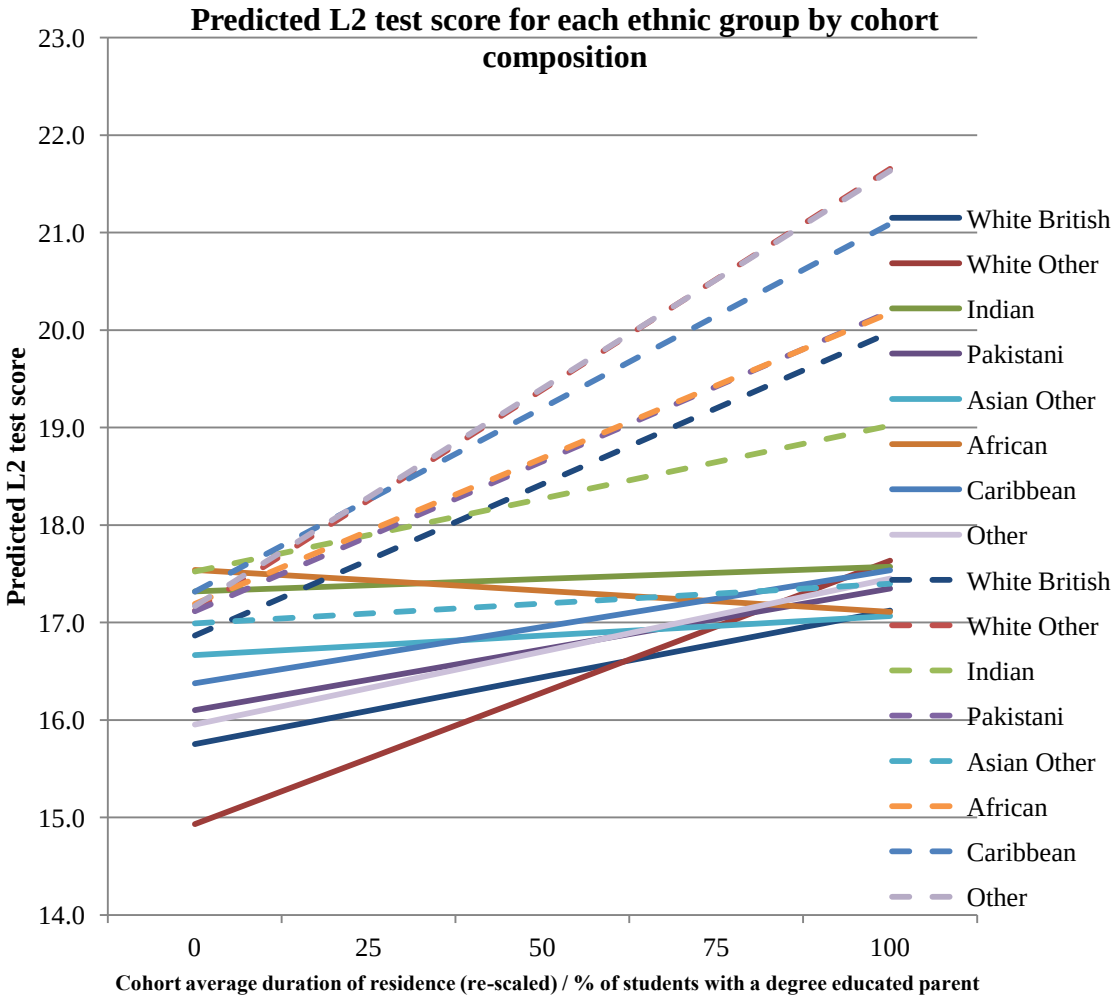
Figure 17 below shows the predicted margins of L2 test score by each of these two school cohort level contextual effects[73]. Confidence intervals have been removed for ease of interpretation, and so the figure shows extrapolated trends rather than significance.

As can be seen, the effects on predicted L2 test score of the school cohort-level measure of parental education seem to be greater than the effects of school cohort average duration of residence. The rate of increase is also greater for the school cohort measure of parental education. This supports the idea of potential spill-over peer effects of student social background.

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[72] The Asian Other group is very heterogeneous, covering as it does any South Asian ethnic identification aside from Indian and Pakistani. The broadness of the category masks this heterogeneity in test scores. Further, statistics in Table 16 suggest that females in the Asian Other group have a lower mean L2 score than males. Therefore, gender-based differences in ethnic differences in L2 test score may be worth further exploration.

[73] Based on model 8 estimates. Model 8 includes interactions by ethnic group. School cohort average duration of residence is re-scaled to allow comparability of estimates.



Note: Dashed lines show % of students with a degree educated parent

Figure 17 Predicted L2 test score by school cohort composition

5.6 Conclusion

This chapter looked at trends in L2 proficiency (as measured by English language test score) across ethnic groups and over variations in durations of residence in the UK. Investigations of individual and social factors that might influence L2 proficiency levels, in particular duration of residence in the UK and L1 use, were carried out. Two hypotheses concerning duration of residence at the individual level and at the school

cohort level were supported. It seems that duration of residence is strongly correlated with L2 test score as students who have lived in the UK for more years typically have higher L2 test scores. It further seems that there is a school cohort-level effect of average duration of residence, with students belonging to school cohorts with higher average durations of residence also typically having higher L2 test scores. The sizes of the duration of residence effects at the individual-level and at the school cohort-level were very similar. These findings support the theory of early age of arrival (e.g. Schmid 2002; de Bode 1996; Isurin 2000) as in this chapter age of arrival and duration of residence are essentially inverted measures of each other (students with a greater duration of residence have an earlier age of arrival and vice versa). The findings here are limited, however, to the specific age range and destination country context under investigation. It is not possible to reliably extrapolate these results to duration of residence at other ages of arrival or to other destination countries.

Only one of the two hypotheses posited concerning L1 use was supported. L1 use at the individual level was associated with lower L2 proficiency, but significance was only found at the 0.10 level. Once the school cohort measure of L1 use was included, the individual level effect disappears. As such, there is very limited evidence from this chapter that L1 use at the individual-level, or at the school cohort-level, is associated with lower L2 proficiency. The theory that languages are detrimentally affected upon contact with each other (e.g. Seliger 1996; Sharwood Smith and van Buren 1991) is not strongly supported in this chapter as there are very limited effects of L1 presence on L2 proficiency. However, this chapter has only analysed this relationship using reports of the presence of L1 in the student's household. This measure may not perfectly capture actual frequency of L1 use by the student. The use of cross-sectional data is also limiting. A better test would involve the use of repeated measures of actual frequency of

L1 use at the individual level and within the school setting. This would better determine causal effects of L1 use on L2 proficiency. It is further possible that L2 use affects L1 proficiency but investigations of this are outside the focus of this chapter.

It is important to note that this study focused on duration of residence in the UK rather than just measures of age of arrival to the UK. In fact, to all extents and purposes, in this study age of arrival and duration of residence are almost identical as the age of the sample students was capped at 15. As such, all sampled students would be of very similar maturational age and so there should not be the substantial age-related differences in the mental development of the sample as one would expect to see in a younger sample (Birdsong 1992). The advantage of a capped age sample is that duration of residence and age of arrival effects are not confounded with one another. The disadvantage is that variations in the identified effects of age of arrival cannot be further investigated to see whether it is age of arrival (arrival before biological maturation constraints can take effect) or duration of residence (effects of increased exposure to the host society) that really makes the difference. This is the first main limitation of this study.

A second main limitation to the study is the problem of endogeneity in the analysis of associations between cross-sectional variables. For example, it is possible that the students who are most proficient in L2 are the ones who are so well assimilated into the destination-country society that they have already stopped using L1. It is also possible that students have been exposed to L2 in their origin country, meaning that the effects of duration of residence may not completely capture total L2 exposure over the student's life. This perhaps explains the positive coefficients for students of African and Indian origins. Such patterns in the sample may lead to under-estimation of the effect of L1 use. It is difficult to determine the causal direction of effects, and the omission of

many key school characteristics, alongside the difficulty in identifying the nature of non-random selection into schools means that is possible that the association found between duration of residence and L2 proficiency is spurious. However, there is well-established and plausible theory to explain the association, which provides some confidence in the results.

A third limitation to the findings of this empirical chapter is that pupil weights were not used in the analyses. This means that findings within the sample data can only be extended to the population with extreme caution. A stratified random sampling method was used to select schools, and then two classes were selected within each school. The sample design was such that students in ethnically dense schools were over-sampled, leading to unrepresentative cases in the absence of appropriate sample weights. It is also possible that there was non-response bias at the school level and at the student level, and so results must again be taken with caution and are limited to the sample i.e. should not be generalised to the population.

A fourth limitation concerns the ethnic background categories used in the analysis. Whilst attempts were made to make use of as much information as possible to determine ethnicity, the categories are still broad and are likely to be vastly internally heterogeneous. For example, the African category alone includes students born in 22 different countries. Such internal variation is masked by the simplification of ethnic categorisation, but this trade-off is accepted here so that general patterns of reasonable meaning can be made.

Future work should focus on disentangling the complicated and interconnected effects of age of arrival and duration of residence to better understand how these influence language proficiency specifically, and integration more generally. This chapter provides

reasonable evidence that there are associations between duration of residence and language proficiency, and that concentrations of students with shorter durations of residence in the UK may lead to lower test scores for all students in the school cohort. The main implication of this contextual level is as in Chapter 3 – the reduction of concentrations of certain "types" of students in schools may lead to better average outcomes for disadvantaged students. In this case, distributing students with shorter durations of residence across schools may help them better acquire L2 through knowledge spill-over type effects and so improve their long-term educational outcomes.

Chapter 6: Conclusion

6.1 Introduction

Ethnic differences in educational outcomes in the UK are a cause of concern for politicians, academics, and wider society because ethnic differences imply ethnic inequalities, and inequality generally is incompatible with the norms and ideals of social justice. Those on one side of the fence, who believe that the British educational system is a true meritocracy, argue that interventions to help groups who are disadvantaged in the educational system is not necessary because those who are the "brightest, smartest and best" - that is to say those with the most merit - will succeed in the system and achieve what they deserve. Those on the other side of the fence, who believe that social background, ethnicity, and other factors influence education outcomes in a non-meritocratic way, argue that our educational system is not a true meritocracy and that this form of social injustice needs to be addressed (e.g. Marshall, Swift et al. 1997). The study of inequalities (ethnic and otherwise) in education and in myriad other arenas is closely linked to philosophical and political ideals of how society should be. Ideology influences attitudes towards inequality, meaning that its study is neither without controversy nor consequence.

Such a study of ethnic inequalities in education is, however, necessary. A substantial body of literature already exists suggesting significant disparities in attainment and progress across ethnic minority groups (e.g. Heath and Brinbaum 2007; Heath et al. 2008; Lessard-Phillips 2009; Rothon 2005; Plewis 2009), and between ethnic minority groups and the majority White British population (e.g. Brinbaum and Heath 2007, Heath, Rothon et al. 2008, Lessard-Phillips 2009, Plewis 2009). These ethnic differences persist net of social class factors (Rothon 2007) and are not always ethnic

disadvantages, hence the reasoning behind the use of the phrase "ethnic differences in education" in this thesis. Understanding the reasons behind ethnic differences in educational outcomes is important from an equality perspective and also because earlier life outcomes are known to have an impact on later life outcomes (Sewell et al. 1969).

The main aim of this thesis was to examine ethnic differences in education and apply social explanations to understand them. More specifically, this thesis attempted to understand how individual level and contextual level factors relating to the relationships between individuals or social groups could account for the existence of ethnic differences in educational outcomes. The focus of the investigation was the nature of the effects social groups and social contexts had on the individual student's educational outcomes. The attempt to understand ethnic differences in education using social explanations can be neatly summarised by the four research questions put forward in the introductory chapter of this thesis:

1. How is the school social context with regards to the ethnic minority and poverty composition of the student population associated with ethnic differences in progress in maths and English between the ages of 11 and 14?
2. How are individual and school cohort level religious attitudes and behaviours associated with ethnic differences in the likelihood of aspiring to university?
3. How are parenting behaviours and closed parental networks (intergenerational social closure) at the individual and school cohort levels associated with ethnic differences in positive schoolwork attitudes and behaviours?

4. How are variations in the duration of residence in England and in additional language use, at the individual and school cohort levels, associated with ethnic differences in English language proficiency?

These questions were addressed separately in each of the four empirical chapters of this thesis. Chapter 2 looked at the broad social context of the school. The research explored how changes over time[74] in the ethnic minority and poverty compositions of the secondary school were associated with differential academic progress outcomes for students from different ethnic backgrounds. Chapter 3 narrowed the social context to focus on the contribution of individual and cohort level religiosity (religious attitudes and behaviours) on ethnic differences in university aspirations. Chapter 4 switched the social context again to investigate the influence of parenting behaviours and closed parental networks on ethnic differences in positive schoolwork attitudes and behaviours. Chapter 5 looked again at the school cohort to understand how individual and cohort level variations in the average duration of residence in the UK, and in the use of an additional language, influenced English language test scores.

This concluding chapter proceeds as follows. Firstly, the main empirical results of this thesis are summarised. Secondly, the implications of these findings for policy and the field of ethnic stratification in education are outlined. Thirdly, the main theoretical and methodological contributions are set out. Fourthly, the limitations of this research and some ideas for addressing these limitations are put forward, alongside some directions for future research. The chapter will finish with a final concluding note.

[74]As a reminder to the reader, changes in school ethnic minority and poverty compositions were calculated using school level measures of each of these compositions in 2008 and in 2010. Changes in school composition are assumed to occur randomly due to compositional variations in each incoming school cohort and each departing school cohort, alongside small numbers of students who change schools during their secondary school years.

6.2 Summary of results

6.2.1 Overall summary of results

Table 18 below summarises the specific results found in each of the four empirical chapters of this thesis. As can be seen, the overall patterns of individual level effects are as hypothesised, whilst the majority of the contextual level effects operate in the same direction as the respective individual level effect. An interesting difference arises in chapter 4, where the individual level and cohort level effects of religiosity on university aspirations are in opposite directions. The following sections elaborate more on the results of each chapter.

6.2.2 Chapter 2 – School composition and academic progress

As the empirical evidence from the National Pupil Database matched to the Pupil Level Annual School Census shows, there appear to be strong and positive associations between increases in ethnic minority density in secondary schools and academic progress made between age 11 and age 14 in maths and English. The positive associations between changes in ethnic minority density and progress are non-linear i.e. there are diminishing returns to progress as year 7-to-year 9 changes in school ethnic minority density increase. This finding suggests that "White flight" from ethnically dense secondary schools is not logical when considering academic progress. The opposite association was found for increases in poverty density; that is, year 7-to-year 9 increases in poverty are associated with decreases in progress made between age 11 and age 14 in both subjects. Again, the association is non-linear i.e. the rate of loss of progress reduces as year 7-to-year 9 changes in poverty density increase. This finding suggests that deprived student populations may have a negative effect on the attainment and progress of students over and above their own level of poverty.

Table 18 Summary table of the individual and contextual level results of this thesis

Chapter	Educational outcome	Key predictor(s)	Individual level associations	Contextual level associations	Interactions by ethnic group
2	Progress in maths and English between KS2 and KS3	Change in ethnic minority density and average poverty between school year 7 and school year 9	Belonging to a non-white British ethnic group mostly positively associated with progress in both subjects (except Caribbean group) Poverty negatively associated with progress.	Increases in ethnic minority density positively, non-linearly, associated with progress. Increases in average poverty negatively, non-linearly, associated with progress.	No significant interactions between ethnic group and either contextual effect.
3	Aspiring to university	Religiosity	Positive associations between increased individual level religiosity and the likelihood of aspiring to university.	No significant main effects of cohort level religiosity on aspirations after controlling for other contextual measures.	No significant interactions between ethnic group and individual religiosity
4	Schoolwork attitudes (importance of school grades) and behaviours (effort put into school work)	Parental social closure	Parental social closure positively associated with importance of school grades after controlling for other parenting behaviours. No significant effects for effort put into school work.	No significant main effects of cohort level closure on either outcome after controlling for other contextual measures.	Significant contextual level interactions for the African and Caribbean groups for the importance of school grades outcome.
5	English language proficiency (test score)	Duration of residence in the UK and the use of an additional language.	Duration of residence positively associated with proficiency. Additional language not significantly associated with proficiency.	Higher average duration of residence of the cohort positively associated with proficiency. No contextual effect of proportion of additional language users in the cohort.	Significant positive interactions between cohort average duration and ethnicity for the White Other and Other categories. Significant positive interactions of proportion of students with a degree-educated parent in the cohort for White Other, Pakistani, African, Caribbean, and Other groups.

The contextual effects of year 7-to-year 9 changes in school ethnic minority density and school poverty density appear to be very similar across ethnic groups, with no significant interaction effects between ethnic group and either of the contextual effects under investigation. However, these contextual effects do not completely explain ethnic differences in progress. Overall, chapter 2 provides evidence that the demographic composition of the school, at least in terms of ethnic minority density and average poverty, is associated with educational outcomes. The finding of the existence of such effects is in line with much of the literature (see chapter 2 for a review of this). The major difference, however, is that the overwhelming majority of papers show negative associations between ethnic minority density (or "racial" density or immigrant density) and educational outcomes. The results in chapter 2 go against the tide of earlier results for three main reasons.

The first reason is that ethnic minorities in the USA and in much of mainland Europe typically occupy a disadvantaged position relative to the ethnic majority group. This disadvantaged position is due to a large degree to the negative selection of the migrant groups in these countries e.g. the low status of the Turkish guest workers in Germany; the legacy of slavery for the African American groups in America. Whilst negative selection may also apply to some ethnic groups in the UK, there are other ethnic groups that are positively selected e.g. Chinese, East African Asians, Indians, and some African groups (Heath and Brinbaum forthcoming). Additionally, these positively selected groups are typically well-established in the UK, with the numbers of third and fourth generations of these groups growing in this country. Unusually, in the UK, there are ethnic minority groups that educationally outperform the ethnic majority group. Further, given the same social class or income position, as seen in this thesis, almost all ethnic minority groups outperform the White British group on certain educational outcomes

(e.g. university aspirations, positive attitudes toward school work). Since ethnic minority students outperform the majority group on some dimensions of education, the expectation that increases in ethnic minority density are associated with improved educational outcomes in England is not so surprising.

The second reason is that much of the work on England and the UK is quite out-dated (the work by Plewis being the noteworthy exception). The educational situation, and crucially the typical generational status (from first generation to second and third generations), of most minority groups has increased since the time of Cline and colleagues' paper (Cline et al. 2002), and of other earlier works on ethnic density.

The third main reason is based on methodological differences. Chapter 2 uses academic progress as the dependent variable, controls for prior attainment, and looks at changes in school composition over time. Most other papers use absolute achievement as the dependent variable, and current school composition as the main predictor variable. This leads analyses to be more susceptible to omitted variable bias (because absolute achievement is likely affected by all sorts of in-school and out-of-school factors that are not captured in models) and also to weaken the potential effect of current school composition by not adequately accounting for non-random selection into schools. The approach of looking at changes in school composition between two time points better accounts for non-random selection into schools because school composition at the time of selection and entry into the school is largely controlled for, and so any variation in composition is subsequent to the initial selection decision. By looking at associations between changes in school composition and academic progress, the risks of these biases are reduced somewhat, potentially leading to the differences in results seen in chapter 2.

6.2.3 Chapter 3 – Religiosity and aspirations

The results of chapter 3 (using CILS4EU data) suggest that there are significant ethnic differences in the likelihood of aspiring to university. These ethnic differences are neither explained by religious affiliation alone, nor by attendance at a religiously affiliated school. This is a key finding as much of the literature argues for positive effects of religiously affiliated schools, but this thesis does not find the persistence of such effects in the presence of controls for ethnicity, religion, and independent school type. It is possible that the religiously affiliated school type effects identified by other authors are driven in the UK by the independent school status held by some of these religious schools. This needs to be investigated in future work.

The main finding from chapter 3 is that individual level religiosity is positively associated with university aspirations. Some individual level mechanisms behind this association were tested for. It was found that the effects of religiosity are mediated to an extent by the internal locus of control of the student, the work ethic of the student, and the avoidance of educationally harmful behaviour. It was not possible to test for effects or mechanisms explicitly connected to religious social capital or the resources available to the more religious student, but it is hypothetically possible that these do contribute positively to educational outcomes. This is another direction for future work.

Alongside individual level religiosity, effects of cohort level religiosity were also tested. Cohort level religiosity was not significantly associated with university aspirations. Thus the results of this chapter show positive effects of individual level religiosity but no significant effects of cohort level religiosity. It was not possible to determine why there is no effect at the cohort level, but one possible explanation is that religiosity operates at a highly individual level in terms of instilling high aspirations for

individuals, but the positive effects of religiosity cannot be transmitted through peers. It is also unclear as to whether the associations (or lack thereof) found for individual and cohort level religiosity would exist for other educational outcomes or whether these patterns only hold for university aspirations. In other words, the results might be particular to the dependent variable under consideration in chapter 3. A simpler explanation could be that there is an (unexplored) positive association between individual poverty and individual religiosity, so that the negative effect of increased average religiosity in the cohort is actually capturing the effect of increased average poverty[75]. This is something that future research could explore.

6.2.4 Chapter 4 – Parenting and schoolwork attitudes and behaviours

Chapter 4 took a closer look at how family social capital, in the form of parent-child relationships, influenced ethnic differences in educational outcomes. The chapter tested Coleman's (1988) theory of intergenerational social closure to see if students who reported that their parents wanted to know the parents of their friends also reported more positive schoolwork attitudes and behaviours (captured by subjective measures of the importance of school grades and effort put into school work) than students who did not report such desires by their parents for social closure. The wave 1 English portion of the CILS4EU dataset was used in this chapter as it contained a measure that could proxy for intergenerational social closure.

The first key result of this chapter is that parental closure at the individual level is positively associated with the importance of school grades (schoolwork attitudes), and

[75] The correlation matrix for chapter 3 (Table 29 on page 270) suggests, however, that cohort average religiosity is weakly positively correlated to the proportion of students with a degree-educated parent in the cohort. Highest education is not the same as poverty status, but the existence of this correlation casts the poverty based explanation somewhat into doubt.

this effect is robust to the inclusion of a range of other parental encouragement and involvement variables. This result is in agreement with Carbonaro's (1998) findings, and additionally, unlike in Carbonaro's results, the positive effect of individual social closure seen here is robust to the inclusion of measures of all close friends being from the same school as the student, and to the presence of an indicator of the student having older friends. Parental closure at the individual level is not, however, associated with effort put into schoolwork (schoolwork behaviours).

The second key results is that there are no additional main effects of contextual (school cohort) level parental closure on either outcome once other contextual measures of ethnic minority density and proportions of students with a degree-educated parent in the cohort were included in the model. There were, however, significant interaction effects on schoolwork attitudes of school cohort closure for two ethnic groups (African and Caribbean). This suggests that students from these groups who belong to school cohorts with relatively closed parental social networks gain academic advantages even if they themselves do not have parents who pursue intergenerational social closure. The finding of no main effect of contextual closure is not in agreement with Morgan and Sørensen's (1999) findings as the results here show no significant positive cohort level effect over and above any individual level closure effect (Morgan and Sørensen only tested for cohort level effects). Therefore, it seems that for most ethnic groups the cohort level parental network aspect of the school community does not directly contribute to educational outcomes. The results for the African and Caribbean groups must be taken with caution, as there are no significant main contextual effects of closure, and the same significant interaction effects do not exist at the individual level or at the cohort level for the effort put into schoolwork outcome variable. This leads to the conclusion that, if

anything, closed parental networks may have more effects on attitudinal measures than on behavioural measures.

The third key result is that there are almost no significant interactions between parental closure and ethnic group, suggesting that (the lack of) effects of closure are the same across groups. Therefore differences in parental social closure do not seem to explain ethnic differences in the outcomes studied in this chapter. It is certainly plausible that any ethnic differences in the effects of parental social closure could explain ethnic differences in other educational outcomes, and so further work is needed to investigate this. Additionally, whilst this chapter focused more on parental social closure, it could be that there are significant differences across ethnic groups in the roles played by other parenting behaviours. This is also worthy of further investigation.

6.2.5 Chapter 5 – Duration of residence and language proficiency

Chapter 5 tested the hypotheses that the age of arrival of immigrant individuals and the use of an additional language influenced English language proficiency. This chapter used the CILS4EU dataset again as it had detailed measures of age of arrival to the UK and objective English language proficiency measures collected from the language test administered alongside the survey. The expectation was that students who arrive in England at earlier ages (and so have a longer duration of residence in England and so a greater potential time for exposure to English society) and who do not use an additional language will be more proficient in English. These expectations were partly realised as the results of the last empirical chapter showed that the longer students have lived in England, the higher they score on the English language test. However, there were no negative effects of having an additional language on English proficiency net of duration

of residence effects. Rather, the principle explanation for differences in English language test score is the duration of residence in England.

In addition, belonging to a school cohort with a higher average duration of residence (in other words, fewer first generation immigrants who arrived at older ages) is positively associated with English language proficiency. This association suggests that the language context of the school cohort may impact on individual students' language proficiencies. This makes sense as language is, by its very nature, a social tool, and so using a certain language with peers who have had a greater duration of exposure to this language should help with the development of own language proficiency.

From the findings of chapter 5, one could conclude that ethnic differences in education that stem from problems with English language proficiency may well have a social component to their explanation. As such, students may be doubly disadvantaged if they are segregated between and within schools according to age of arrival or generation status as this limits exposure to students who have had a greater duration of residence, and so exposure, to English. Further work needs to be carried out that looks at differences in educational achievement by students' duration of residence in England to see whether English language proficiency is indeed the mechanism through which ethnic disadvantage in achievement and attainment operates.

6.3 Contributions to the field

6.3.1 Theoretical contributions

There are two main theoretical contributions made by this thesis: the broad investigation of contextual effects in school settings, and the consideration of religiosity and intergenerational social closure as drivers of ethnic differences in educational outcomes.

6.3.2 School-based contextual effects

The main theoretical contribution of this thesis is the focus on social explanations; more specifically on contextual effects at the school level and the cohort level within schools. This is the first large-scale analysis of social context effects in England, which has brought forward and expanded upon social context based explanations for ethnic differences in education. By considering new dimensions of social context and also multiple dimensions of social context at the same time, this thesis has pushed forward the boundaries of prior school effects and contextual effects work. Such past work has typically focused on different compositional effects, such as those of gender (e.g. Hoxby 2000a; Lavy and Schlosser 2007), socioeconomic status (e.g. Schneeweis and Winter-Ebmer 2006; McEwan 2003), ability (e.g. Hoxby 2000a; Hanushek, Kain et al. 2003), and immigrant status (e.g. Friesen and Krauth 2011; Schwartz and Stiefel 2011; Yeung 2011). There has been some work on compositional effects of race and ethnicity (e.g. Bifulco, Fletcher et al. 2008; Hanushek, Kain et al. 2009; Hanushek and Rivkin 2009) but the cited literature has not used school based contextual effects to explain ethnic differences in educational outcomes. Additionally, this thesis has explored alternative potential contextual effects, such as those of cohort average religiosity and cohort composition terms of intergenerational social closure[76], whilst also exploring the UK educational context rather than the typically explored US situation. As was seen in section 2 of this chapter, contextual effects appear to be present for a range of educational outcomes. Why might these effects exist? Social class composition effects i.e. the positive associations found between concentrations of higher SES students and

[76] These two effects are perhaps more accurately described as endogenous effects rather than contextual (exogenous) effects as they refer to student or parent behaviour rather than their characteristics.

educational outcomes are thought to be driven by a number of mechanisms, which have been detailed in van Ewijk and Sleeger's meta-analysis paper (2010). The first of these mechanisms is the atmosphere in the classroom (Hoxby 2000a), which is based on the idea that higher SES students are better behaved and more motivated to learn, leading to a more learning-focused and more disciplined atmosphere in the classroom. The second mechanism suggest that teachers respond more favourably towards higher SES students, and so deliver better lessons and provide more challenging teaching to classes with higher SES compositions (Harker and Tymms 2004). Linked to this mechanism is the potential for schools with more SES students to attract teachers of higher quality, assuming teachers prefer to work in higher SES schools rather than lower SES schools (Barbieri, Rossetti et al. 2011). The third mechanism is competition amongst peers (OECD 2001), which assumes that high SES students are more motivated and able, which leads to greater competition for educational success in schools with more high SES students. The fourth mechanism operates through the correlated effect of more parental involvement and support for students in schools with higher SES compositions (Opdenakker, Van Damme et al. 2002). In other words, high SES students are more likely to have more parental support for their educational endeavours, meaning that the positive association found between higher SES composition schools and better educational outcomes can be explained by the greater levels of parental involvement typically found in higher SES composition schools.

Extending the theoretical literature on SES composition effects, it seems reasonable to speculate that there could be both positive and negative effects of other types of student compositions on educational outcomes, which operate in a similar way to SES composition effects. Additionally, these positive and negative effects may, to an extent, neutralise each other thereby leading to weaker observed associations than may be

found if effects of only one direction were measured. For example, the positive school effects of high aspirations of ethnic minority students may be ameliorated by the negative school effects of the higher poverty status of ethnic minority students.

Turning to immigrant educational disadvantage, it is possible that the negative effects of immigrant concentration on educational outcomes are due to the typically lower destination-country language proficiency of immigrant students (see chapter 5 for evidence of this). It is highly plausible that there are peer effects of low language proficiency, which lead to lower educational outcomes in schools with higher immigrant concentrations. It could also be the case that immigrant students have had poorer quality educational experiences in their countries of origin, which in turn contribute to educational disadvantage in the UK. Additionally, higher concentrations of low language proficiency immigrant students may slow down the rate of learning in the classroom because of the extra support they require or because of differences in culture.

In contrast, thinking about ethnic minority educational advantage and school compositions of similar peers, it is possible that ethnic minority segregation provides educational benefits for ethnic minority students because of the "frog pond model" explanation (Davis 1966). Davis' frog pond model suggested that "relative deprivation" (Stouffer, Suchman et al. 1949) occurs in educational institutions, leading students to compare their academic performance to their peers within the same institution (and not with those outside of the institution) without also considering differences across institutions in ability. As such, low performing students in higher average ability schools had a tendency to evaluate themselves less favourably than students of similar ability in lower average ability schools. Marsh and colleagues showed similar results, suggesting that it was better to be a "big fish in a little pond" because of the beneficial effects this had on student's academic self-concept and subsequent educational

outcomes (Marsh 1987; Marsh and Parker 1984). Applying this idea to ethnic minority educational performance, if schools with higher ethnic minority compositions are also those with lower average ability levels, then above average students at such schools should have more positive academic self-concepts, which lead to better educational outcomes for these students. Thus a potential mechanism for positive associations between school ethnic minority composition and educational progress is the "frog pond" or "big fish in a little pond" effect.

An alternative mechanism is differing school climates across schools with different compositions of students. As mentioned by Rutter (1983), classroom behaviour, positive school attitudes, and attendance are fundamental to good educational outcomes. Schools with different compositions may also vary in these attitudes and behaviours. If schools with greater ethnic minority densities have more students that behave in ways conducive to good educational outcomes, thereby contributing to a positive educational atmosphere in the school, then this could explain positive associations between ethnic minority composition and educational progress.

In summary, there are a range of plausible theoretical mechanisms through which school contextual effects could be operating and which may lead to ethnic differences in educational outcomes. As such, this thesis makes a theoretical contribution through its use of contextual effects as potential explanations of ethnic differences in educational outcomes; previous work has not used such an approach in this way.

6.3.3 Religiosity and intergenerational social closure

The work on religiosity in chapter 3 makes a theoretical contribution as the literature on ethnic differences in education has not normally considered the role of religion. Given the considerable overlap between ethnicity and religion in the UK, it is certainly

plausible that the persistent educational advantages and disadvantages of some ethnic groups can be explained by differences in religious behaviours rather than differences based more broadly on ethnicity. This thesis pushes the role of religion forward and tries to suggest some reasonable mechanisms through which the effects of religiosity on education could operate.

Additionally, this thesis is one of a very limited number of pieces of research that explicitly attempts to test Coleman's intergenerational social closure theory (Coleman 1988). Further, this thesis has considered Coleman's theory from both an individual level and a cohort level perspective. Other studies have only considered Coleman's theory from one of these perspectives, but this thesis argues that closed parental networks can be relevant at both levels (for some ethnic groups) i.e. students can benefit if their own parents' have closed networks, and if they belong to school communities where parents generally have closed networks.

6.3.4 Methodological contributions

A major methodological contribution made by this thesis is the implementation of statistical analyses upon a brand new dataset. The Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU) dataset is previously unexplored with regards to contemporary ethnic differences in educational outcomes in England. Alongside the novelty of the data, another advantage of this dataset is the rich range of measures available. These measures included comprehensive questionnaire items on religiosity and parenting behaviours, and allowed analyses to be carried out to predict school work attitudes (an underexplored educational measure). The inclusion of objective cognitive ability and language tests in wave 1 was also a positive feature of the data and study. The sampling strategy meant that accurate cohort level measures of

social context could be calculated. Cohort level analysis within schools is not typically carried out, with the preference being for analysis at the individual level or at the whole school level. The school cohort (school year group) is an important intermediate level between the individual and the whole school and so this thesis makes a contribution by focusing some analyses on the context of this intermediate social level.

Another major methodological contribution is seen in chapter 2, where changes in school composition between two school years are used the key predictor variables. The use of changes in ethnic minority density and poverty density in this way is a novel strategy for the British literature (the other main use of such a strategy can be seen in Hoxby (2000a) but it has not been frequently adopted in the ethnic stratification in education literature). The analysis of students' progress between Key Stage 2 and Key Stage 3 has not been well studied before, as most of the literature focuses on GCSE (Key Stage 4) outcomes. In the same way, this thesis makes a contribution by looking at the educational outcomes of an under studied age group (14-15 year olds).

In terms of ethnic classification, this thesis considers the difficulties in identifying what ethnicity is, what factors contribute to ethnicity, and how ethnicity can be best operationalised. In chapter 2 the thesis makes use of parental categorisation of their child's ethnicity according to the standard Census ethnicity options. However, in the other three empirical chapters, students are allocated into ethnic groups according to a classification process created by the author. Ethnic background was constructed using a three stage process. As a reminder to the reader of this process, firstly, students born abroad were allocated to ethnic origin groups based on their region of birth. Secondly, the remaining students born in the UK were allocated based on the region of birth of their parents. If either parent was born abroad, the student was allocated to the corresponding non-White British ethnic origin group. Where there were differences in

the regions when both the mother and the father were born abroad, then the student was allocated to the mother's region Thirdly, the students born in the UK were allocated to ethnic origin groups using their response to an ethnic belonging question, in which students were asked which group(s) they felt they belonged to and presented with a list of ethnic categories and an "other" category where they could record an open response. Students with ethnic groupings that were missing after the three stage process were placed in the "No group/missing" ethnic background category. Students who reported being born in Britain, reported both parents as also being born in Britain, and reported that they belonged to "no other group" for the question on ethnic belonging were classified into the White British ethnic group.

As such, this thesis makes a theoretical contribution by defining another process through which ethnicity can be specified in the absence of a self-identification Census-style measure. The classification process used is one of many processes that could have potentially been applied. An interesting future project would be to evaluate how well self-identification through Census measures corresponds to the ethnic classification reached through the process used in this thesis, and to further investigate and evaluate alternative processes of defining ethnicity.

6.4 Implications for policy and for the field

6.4.1 School composition effects and the redistribution of students

The results of chapters 2 and 5 point towards effects of school composition on educational outcomes. The results from chapter 2 are convincing as they are drawn from a very large dataset, which includes data on every child attending secondary school in England. Whilst the analysed sample is somewhat reduced due to issues of missing data, there are still ample cases upon which reliable conclusions can be drawn (although the

lack of a generation status measure is unfortunate). The use of change in composition variables also better support the conclusion that school composition effects do exist as these change variables suffer less from selection bias once initial composition is controlled. The results from chapter 5 are also convincing as the outcome measure (English test score) is objectively captured, whilst detailed information on generation status and ethnicity are available.

What do the conclusions of these chapters mean for policy? The most general recommendation for policy is that students should not be concentrated into school according to "type", where type refers to any sort of demographic dimension or characteristic. There appears to be a particular educational disadvantage for students attending schools with high average levels of poverty, indicating that there may be "concentrations of economic disadvantage" in schools, which have effects on all students regardless of their own individual poverty status. The clear implication for policy here is that economically poor students should be distributed more evenly across schools so as to avoid such concentrations of poverty. In the same way, policy makers could consider redistributing students from those high performing ethnic groups in order to share out the "beneficial effect" of ethnic minority status on educational outcomes. In practice, such redistribution or intervention by the state may be undesirable to individuals and families, who may prefer to make their own school choice decisions.

In the same way, the findings of chapter 5 suggest that first generation students (those with an average duration of residence in the UK less than their age) should also be more evenly distributed across schools so as to reduce educational disadvantages in language proficiency. Given the likely overlap between first generation status and poverty status, perhaps the reallocation of poor students would be sufficient as this would also lead to a reallocation of first generation students. It is not clear, however, what effect such a

redistribution of first generation students would have on educational, and other, outcomes aside from English language proficiency. Further, such "social engineering" is neither easily implemented nor necessarily ethical.

The results for the effects of cohort ability composition were not presented in this thesis, but separate analyses carried out by the author indicate that ability composition effects also exist and are positively associated with improved progress i.e. increases in the average ability of the cohort are associated with increases in individual progress net of controls for own ability. This poses a dilemma for policy as better educational outcomes may be achieved by pooling the most able students together, but this is to the disadvantage of the less able students left behind.

6.4.2 Young people and religion

The findings from chapter 3 suggested positive associations between individual religiosity and university aspirations. Thus one policy implication that can be drawn from the findings of this chapter is that the religious attitudes and behaviours of young people should be encouraged. A more extreme policy implication is that schools should instil religious behaviours in their students. Both these policy implications should be qualified swiftly because of the obvious ethical issues; in particular, there are arguments that religious matters should be left to individuals and families rather than interfered with or determined by the state[77]. Additionally, the relationship between religiosity and university aspirations is at least partly mediated by improvements in the student's internal locus of control, their work ethic, and their avoidance of educationally harmful

[77] Despite the UK maintaining an official state religion (the Church of England), in practice the governance of the UK is mostly secular. There are, however, some links between church and state in the UK. Religiously affiliated schools and faith schools can be funded by the state in the UK.

behaviour. Therefore, the more moderate policy implication is that schools and families should try to instil these norms, values and behaviours in young people, whether through religion or through other means. Some of these other means could be certain extra-curricular activities, such as sports or music. The growth of the non-religious population in the UK (Office for National Statistics 2012a) means that alternative methods to promoting religion in schools should be seriously considered. It seems clear that these mediating variables have positive associations with educational outcomes, and so should be encouraged as much as possible.

6.4.3 Parenting behaviours

Chapter 4 showed that parental closure was positively associated with student's reports of the importance of school grades at the individual level but generally not at the cohort level (except for the African and Caribbean groups). The mechanisms behind this association are not entirely clear, but it is possible that closed parental networks encourage pro-school norms. Regardless of the precise mechanism, the cohort level finding for two ethnic groups suggests that schools with higher proportions of students from these ethnic groups should attempt to bring parents together and connect them to a broader school community so as to stimulate parental closure at the individual and cohort levels. It is likely that some schools engage parents and try to involve them in school activities more than others. If there is a benefit to engaging parents with school activities, thereby providing them with opportunities to get to know each other and create closed parental networks, then schools should try to do this if they have students from the ethnic groups that appear to benefit from both individual and cohort level parental closure.

More generally, chapter 4 found positive effects of other parenting behaviours. These parenting behaviours focus around encouragement of children by parents and involvement by parents in the lives of their children. They are behaviours that provide care, encouragement, and supervision for children. Parents who have good relationships with their children and are actively involved in their children's lives may improve their children's educational outcomes. The precise mechanisms through which this could work are not investigated in this thesis, but there is sufficient evidence to recommend that parents are encouraged to be positively involved in their children's lives and to monitor their activities outside of the home. Additionally, the disadvantage experienced by children living in single parent households (and particularly lone mother households) needs to be addressed.

6.4.4 English proficiency

Chapter 5 investigated English language proficiency. English language test score was the dependent variable in the analysis and was found to be significantly associated with student's duration of residence in the UK and also the average duration of residence of the school cohort. As mentioned earlier in this section, the findings indicate potential language-based peer effects, and so efforts must be made to ensure that students are not clustered in classrooms and schools by duration of residence. In addition to this, and although not explicitly investigated in this thesis, it seems clear that proficiency in English is fundamental to educational achievement more generally. Without proficiency in English, students may struggle to understand and cope with school lessons, which will in turn have deleterious effects on examination performance.

The finding of a disadvantage in English proficiency for students who have had a shorter duration of residence in the country leads to the policy recommendation that first

generation immigrant students (and other students with a shorter duration of exposure to English) should be provided with extra language support to enable them to gain proficiency more rapidly. In addition to this extra language support, students should be encouraged to mix together at school so that English proficiency can be developed through informal interactions with peers. The latter suggestion has both educational and integration benefits.

6.5 Limitations of the study and directions for future research

The main limitations of the study were highlighted in chapter 1. Here, these limitations will be revisited briefly with some ideas for how future research can address these limitations.

6.5.1 Non-random selection into schools

The non-random selection of students into school is a major issue for this sort of research. It is a big issue because the research questions addressed in this thesis attempt to understand how social capital and social context affect educational outcomes, but if students (and/or their parents) select schools according to their social capital and social contexts in the first place, then the assumption that students are randomly allocated to schools is violated, and the estimated effects of school/cohort social context on educational outcomes become biased. It is not hard to imagine that some parents may choose (or avoid) certain schools because of the ethnic or poverty composition of that school. Similarly, parents may choose (or avoid) certain types of schools, e.g. religiously affiliated schools, according to their own preferences and beliefs. In the same way, parents who are more active in school choice may also be more involved in their children's lives and may be more interested in encouraging positive educational outcomes. Such parents may be more inclined to seek parental closure and to join closed

parental networks. Thus the problem of non-random selection into schools affects all four empirical chapters in this thesis.

In order to limit the problems of selection bias, chapter 2 used change in social context measures (essentially a school cohort fixed effects approach), whilst chapters 3, 4 and 5 included controls for the proportion of ethnic minority students in the cohort and the proportion of students with a degree-educated parent in the cohort[78][79]. These approaches may limit some of the potential bias, but are not perfect by any means. Future work could consider analysing social contexts using Jencks and Mayer's ideas (1990). They suggest that comparing similar children from different types of families, or who live in different types of neighbourhoods, or who attend different types of schools, or who have different religious involvement patterns would be a way to control for individual effects, thus better allowing the researcher to parse out the effect of the family, school, neighbourhood, or religious community on the children's outcomes. This could be done using statistical controls, but a more advanced method would be propensity score matching. Another approach would be to make use of data on siblings or twins who attend different schools, as this is one way to potentially control for family and neighbourhood context. This approach assumes that the siblings have the same family and neighbourhood context, and that parents exercise the same school selection preferences for all their children. A third approach would be to attempt to model school selection in the first place, but finding data on school choice that is not correlated with eventual school outcomes is difficult to come by. A fourth approach involves the use of

[78] These two measures capture specific dimensions of the school social context. It is certainly plausible that other dimensions (not available in the dataset or not included in the analysis) may also potentially influence selection into schools.

[79] Chapter 5 additionally included an indicator of the ethnic density strata from which the school was sampled, whilst chapter 3 included a dummy for independent school attendance and a dummy for attending a religiously affiliated school.

natural experiments with random allocation, such as those used to allocate students to dormitories at US colleges (e.g. Sacerdote 2001; Zimmerman 2003). Even when using randomised trials or matching cases using propensity scores, most studies still have difficulties in definitively identifying causal social capital or contextual effects. Nevertheless, future work should be concerned with trying to address this problem.

6.5.2 Cross-sectional data

An additional problem arises through the use of cross-sectional data as such data is more prone to endogeneity. Unfortunately, for the most part, the modelling in this thesis uses cross-sectional CILS4EU data. This makes it difficult to identify causal associations because of the cotemporaneous nature of the independent and dependent variables, leading to Manski's fundamental reflection problem (1993). Causal interpretations must be made cautiously as, strictly speaking, cross-sectional data only shows correlations between variables but cannot reliably determine causality. This is especially so for variables that are measured simultaneously and where no assumption of prior causal ordering can be justified. In the introduction, the reader was urged to interpret the use of the term "effects" in a cautious manner as it is predominantly used in this thesis to refer to statistical associations rather than causal effects. The reader is again reminded of this caveat.

Future work needs to consider the same research questions from a longitudinal perspective. This would allow changes in social context to be measured at time point 1 and time point 2, and these changes used to predict outcomes measured at a later time point again. In this way, causal ordering problems are reduced.

6.5.3 Self-report measures and student non-response

As noted in the introduction, the CILS4EU data used in thesis may potentially suffer from bias through student self-reporting. The NPD/PLASC data is less at risk because schools provide the bulk of the measures (with parents and teachers providing some information). In terms of the NPD analysis, teacher reports of student achievement were used, which could be subject to bias as objective tests were not used. It is expected that any systematic bias would be at the school level. Since students change schools between year 6 (when students are in primary school and Key Stage 2 results are collected) and year 9 (when students are in secondary school and Key Stage 3 results are collected), it is hoped that the risks of this bias are reduced. Nevertheless, the measures in both datasets may be susceptible to some bias and/or inaccuracy due to incorrect reporting or non-response.

One approach to address this issue is to collect (more) objective measures. For example, rather than relying on students' reports of the effort they put into school work, teachers' reports of effort could be used. An even better outcome measure, which is currently unavailable in the CILS4EU dataset, is performance in external examinations. The most relevant external examinations for this age group are the GCSEs, which were sat in summer 2012. GCSE exam performance is a good measure (at least when comparing within cohorts) because it is objectively measured in multiple academic subjects and can be compared across students and schools in the dataset. Future work should consider the role of the various social contexts explored in this thesis in influencing GCSE outcomes.

Another approach is to combine reports from multiple sources or over multiple time points. Taking repeated measures from the same individual should produce more

reliable results, assuming the responses are consistent and the repeated measures are equally valid. It is still possible that students misreport for all items, but the risk should be lower for multiple items. This logic lies behind the use of combined item scales in many of the models in this thesis as such scales should reduce the risk of finding effects that are due to random noise or biased reporting for any one item.

A third approach is to impute missing or unreliable measures either by using common or representative values, or by using other variables that could reasonably predict the required measure. Imputation strategies were not used in the main analyses of this thesis because the two variables most frequently missing – ethnicity and an indicator of social background – were themselves determined using other variables, which were, by their nature, difficult to impute with the available data. For example, imputing the country of mother's birth so as to determine the child's ethnic group was not possible as there was limited other information that could be used from the children's survey to do this. Using this limited other information e.g. child's report of ethnic group belonging to impute mother's country of birth would in any case result in a circular process in terms of the ultimate aim of determining the child's ethnic group. Imputation methods are controversial, but can help reduce problems of low sample sizes due to missing cases. However, conclusions drawn from imputed samples must be drawn with even more caution than normally encouraged.

There was very low response to the parental questionnaire in CILS4EU, so one direction for further work would be to try to improve the quality of data on parents in this dataset by either re-surveying the students on their reports about their parents, or re-surveying the parental generation and trying to drastically improve the response rate. The approach used in this thesis was to use highest parental education or highest parental occupational status in the household, thereby reducing the demand for complete

data on both parents. In terms of the risks of students providing biased answers so as to conform to what they believe is the "correct" or "appropriate" response to survey items, this could be addressed in future by allowing students to respond in private e.g. through online surveys that they can do privately outside of school.

A related problem concerns the testing of theories and operationalising appropriate variables from the CILS4EU dataset. In particular, there are limitations in chapter 4 in the testing of Coleman's theory of intergenerational social closure due to weaknesses in the questionnaire item used to measure parental closure. Students were asked to report how much their parents *wanted* to know the parents of their friends rather than what proportion of the parents of their friends their parents *actually* knew. This meant that the questionnaire item confused parental desire for intergenerational social closure with the existence of actual social closure. Similarly, the measures of religiosity used in chapter 3 do not capture all dimensions of religiosity, nor do they indicate whether any social capital or resources are gained by students through their membership in religious communities. Future work should both try to find better measures with which to test Coleman's theory, and to identify any sources of social capital that arise through religiosity and religious communities.

6.5.4 Ethnic categorisation

As defined in the note on ethnicity in section 1.3 of the introductory chapter, ethnicity is a fluid concept to which multiple characteristics, factors, and dimensions contribute. As such, the process through which ethnicity is determined is an open one. The same process was used to classify students' ethnicities in all CILS4EU empirical chapters; in the NPD/PLASC chapter, the ethnicity of students was determined by parents. Despite the use of a consistent process across CILS4EU chapters, the findings are limited by difficulties in validating the process. Although the European literature does typically classify students by their "migration background" i.e. the countries the student, their parents, and their grandparents were born in, the order of additional steps used in the process (for example using students' own reports of ethnic group belonging) was decided by the author. There is nothing to say that this process of ethnic categorisation is valid.

Important future work should look at the correlation between the outcomes of this process of ethnic categorisation and students' self-identification into ethnic groups using the Census style ethnic classification question introduced into the English portion of the CILS4EU survey in wave 2. Additionally, the degree of overlap between students' self-categorisation according to the Census style question and their reports of ethnic belonging using the open response ethnic belonging question should be investigated, as there is a growing support for the idea that an open response format is the best way to capture the true extent of ethnic diversity in the country (Aspinall 2012). This will be an important test of the reliability and validity of the process of ethnic categorisation used here; assuming students' reports of their "Census ethnic group" are themselves reliable and valid. Future work should also be concerned with the Mixed ethnic group, as it is both rapidly growing in size and is hugely internally

heterogeneous. Improved ethnic categorisation processes and a re-evaluation of which ethnic categories are relevant and salient are needed.

6.5.5 Relevant social contexts and overlapping social contexts

This thesis has focused on investigating social explanations for ethnic differences in education. The social explanations featured in each of the empirical chapters were looked from the individual level and from the school cohort or whole school level. Thus this thesis has assumed that the other students belonging to the same cohort (school year group) and to the same school are the ones who shape and mould the relevant social context for the outcomes of the individual student. In fact, there could be many other relevant social contexts for the average teenager growing up in England today that have not been considered by this thesis. These social contexts could be formed by other groups of students within the school, such as those students in the same school house[80] or those students who attend the same extra-curricular activities like sports, music, and drama. Relevant social contexts are also very likely to exist outside of the cohort and school environment. One prominent social context that has not been explored at all in this thesis is that of the neighbourhood. It is likely that the neighbourhood social context, in terms of its composition along multiple dimensions, has an effect on educational outcomes. Many students attend schools close to their homes, meaning that it is further likely that the school social context and the neighbourhood social context overlap at least to some extent. This makes it difficult to disentangle the effects of the neighbourhood from the school. Future research needs to investigate the role of the neighbourhood, and also of other relevant social contexts for young people, to see what

[80] The house system in British schools is way of vertically dividing (i.e. across ages) pupils into groups so as to promote loyalty within a group and to facilitate inter-group competitions. Sometimes pastoral care is provided through houses.

effects these have on educational outcomes. In particular, such research should try to estimate how much influence school contexts have relative to neighbourhood contexts.

6.6 Final note

The main aim of this thesis was to examine and explain ethnic differences in education using social explanations. The research presented here involved a direct investigation of the presence and influence of various contextual effects - specifically the ethnic and poverty compositions of schools, the religious attitudes and behaviours of the school cohort, the extent that students belong to cohorts with closed parental networks, and the language proficiency and length of UK residence of peers,. The main sources of data for the empirical research chapters were the National Pupil Database (NPD) and Pupil Level Annual School Census (PLASC) for chapter 2 and the Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU) for chapters 3, 4 and 5. These were both large-scale datasets containing the necessary information about young people living in England needed to answer the research questions of this thesis.

The research successfully examined how certain individual and social factors can affect the educational outcomes of interest and how individual and social explanations could be used to explain ethnic differences in educational outcomes. Specifically, this thesis found that:

1. Increases in ethnic minority density in secondary schools are associated with increased progress in English and maths between the ages of 11 and 14, while increases in poverty density in secondary schools are associated with decreased progress in English and maths between the ages of 11 and 14. There are some variations in these effects by ethnic group.

2. Individual religiosity is positively associated with university aspirations, but cohort level religiosity is not significantly associated with university aspirations. Effects are the same across ethnic groups.
3. Parenting behaviours are positively associated with both schoolwork attitudes and schoolwork behaviours. Parental closure has positive effects at the individual level but only for schoolwork attitudes (importance of school grade), not for schoolwork behaviours (effort put into schoolwork). There are no main effects of school cohort level parental closure for either outcomes, but there are significant interaction effects with cohort closure for the African and Caribbean groups for schoolwork attitudes.
4. The duration of residence in England is a strong positive predictor of English language proficiency and almost entirely explains ethnic differences in English test scores. Having an additional ethnic language does not negatively affect English proficiency once duration of residence is accounted for.

The work presented here made a number of theoretical and methodological contributions, the two principle contributions being the theoretical consideration of social explanations for ethnic differences in education, and the use of the CILS4EU dataset.

This thesis has succeeded in its intention to identify some individual and social explanations for ethnic differences in education. It is hoped that the research presented here improves the understanding of the relevance and role of social explanations as factors in differential educational outcomes by ethnicity. However, until educational outcomes are equal across ethnic groups, and until ethnicity ceases to be a relevant factor in education, there is work to be done.

Appendices

Table 19 Descriptive statistics of categorical variables used in the maths sample in chapter 2

Variable	Proportion	Percentage
Sex		
Male	254,394	50.85
Female	1,765	49.15
Ethnic group		
White British	398,256	79.6
Bangladeshi	6,088	1.22
Indian	11,455	2.29
Pakistani	14,154	2.83
African	11,291	2.26
Caribbean	6,763	1.35
White Other	13,728	2.74
Chinese	1,699	0.34
Mixed	17,685	3.53
Other	19,188	3.84
Attends a girls only school		
No	468,667	93.68
Yes	31,640	6.32
Prior maths attainment at KS2		
Level 2	4,533	0.91
Level 3	86,504	17.29
Level 4	240,960	48.16
Level 5	168,310	33.64
Progress in maths		
0 levels	31,176	6.23
1 level	152,864	30.55
2 levels	236,306	47.23
3 levels	78,156	15.62
4 levels	1,805	0.36
Total	500,307	100.00

Table 20 Descriptive statistics of continuous variables used in the maths sample in chapter 2

Variable	N	Mean	S.D.	Min.	Max
Individual poverty score	500,307	0.22	0.18	0.01	1.00
Age in months	500,307	160.87	4.39	132.00	178.00
Year 7 school ethnic minority density	500,307	0.22	0.25	0.00	1.00
Year 7 school poverty density	500,307	0.22	0.13	0.03	0.95
Year 7-to-year 9 change in ethnic minority density	500,307	-0.04	0.09	-0.99	0.94
Year 7-to-year 9 change in poverty density	500,307	0.00	0.03	-0.87	0.54
Number of students in school	500,307	1126.92	372.50	16.00	2620.00

Table 21 Descriptive statistics of categorical variables used in the English sample in chapter 2

Variable	N	Percentage
Sex		
Male	250,934	50.11
Female	249,790	49.89
Ethnic group		
White British	398,499	79.58
Bangladeshi	6,191	1.24
Indian	11,512	2.3
Pakistani	14,410	2.88
African	11,404	2.28
Caribbean	6,919	1.38
White Other	13,257	2.65
Chinese	1,653	0.33
Mixed	17,863	3.57
Other	19,016	3.8
Attends a girls only school		
No	468,686	93.6
Yes	32,038	6.4
Prior English attainment at KS2		
Level 2	3,121	0.62
Level 3	71,612	14.3
Level 4	254,079	50.74
Level 5	171,912	34.33
Progress in English		
0 levels	60,168	12
1 level	270,131	54
2 levels	157,593	31
3 levels	12,556	3
4 levels		
Total	500,724	100.00

Table 22 Descriptive statistics of continuous variables used in the English sample in chapter 2

Variable	N	Mean	S.D.	Min.	Max
Individual poverty score	500,724	0.22	0.18	0.01	1.00
Age in months	500,724	160.86	4.39	132.00	178.00
Year 7 school ethnic minority density	500,724	0.22	0.25	0.00	1.00
Year 7 school poverty density	500,724	0.22	0.13	0.03	0.95
Year 7-to-year 9 change in ethnic minority density	500,724	-0.04	0.09	-0.99	0.91
Year 7-to-year 9 change in poverty density	500,724	0.00	0.03	-0.87	0.54
Number of students in school	500,724	1127.60	371.75	16.00	2620.00

Table 23 Correlation matrix of independent variables in chapter 2

	Maths progress	English progress	Female	Poverty	Age in months	KS2 maths level	KS2 English level	Ethnic group	School size	Girls school
Maths progress	1.00									
English progress	0.26	1.00								
Female	0.02	0.13	1.00							
Poverty	-0.19	-0.09	0.01	1.00						
Age in months	0.06	0.03	0.00	0.03	1.00					
KS2 maths level	0.25	0.14	-0.09	-0.17	0.05	1.00				
KS2 English level	0.38	-0.10	0.13	-0.20	0.07	0.57	1.00			
Ethnic group	0.01	0.04	0.00	0.24	-0.01	-0.03	-0.04	1.00		
School size	0.06	0.03	0.00	-0.13	0.00	0.06	0.07	0.00	1.00	
Girls school	0.06	0.08	0.26	0.07	-0.01	0.04	0.08	0.11	-0.05	1.00
Ethnic density in year 7	-0.01	0.02	0.01	0.43	0.00	-0.04	-0.05	0.45	-0.02	0.21
Average poverty in year 7	-0.18	-0.08	0.01	0.69	0.03	-0.15	-0.18	0.27	-0.17	0.09
Change in school ethnic minority density	0.00	-0.01	0.00	-0.09	0.01	0.01	0.01	-0.19	0.02	-0.04
Change .in school average poverty	0.03	0.01	0.00	-0.07	0.02	0.02	0.02	-0.03	-0.02	0.00

	Ethnic density in year 7	Average poverty in year 7	Change in school ethnic minority density	Change in school average poverty
Ethnic density in year 7	1.00			
Average poverty in year 7	0.61	1.00		
Change in school ethnic minority density	-0.45	-0.17	1.00	
Change in school average poverty	-0.10	-0.25	0.26	1.00

Note: Correlations are calculated here for only those cases in both the maths sample and the English sample.

Table 24 Full models predicting progress in maths between Key Stage 2 and Key Stage 3 (ch.2)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	b	**s.e.**	**b**	**s.e.**	**b**	**s.e.**	**b**	**s.e.**	**b**	**s.e.**
Ethnic group (ref=White British)										
Bangladeshi	0.19***	(0.01)	0.19***	(0.01)	0.20***	(0.01)	0.20***	(0.01)	0.20***	(0.01)
Indian	0.24***	(0.01)	0.24***	(0.01)	0.24***	(0.01)	0.23***	(0.01)	0.23***	(0.01)
Pakistani	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)	0.10***	(0.01)
African	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)
Caribbean	-0.04***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)
White Other	0.08***	(0.01)	0.08***	(0.01)	0.08***	(0.01)	0.08***	(0.01)	0.08***	(0.01)
Chinese	0.40***	(0.02)	0.40***	(0.02)	0.40***	(0.02)	0.40***	(0.02)	0.40***	(0.02)
Mixed	0.01*	(0.01)	0.01*	(0.01)	0.01*	(0.01)	0.01*	(0.01)	0.01*	(0.01)
Other ethnicity	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)
Female	0.07***	(0.00)	0.07***	(0.00)	0.07***	(0.00)	0.07***	(0.00)	0.07***	(0.00)
Student poverty (grand mean centred)	-0.51***	(0.01)	-0.50***	(0.01)	-0.47***	(0.01)	-0.47***	(0.01)	-0.47***	(0.01)
Age in months (grand mean centred)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Standardised KS2 maths level	0.15***	(0.00)	0.15***	(0.00)	0.15***	(0.00)	0.15***	(0.00)	0.15***	(0.00)
School size (mean centred)			0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Girls only school			0.20***	(0.02)	0.18***	(0.02)	0.15***	(0.02)	0.15***	(0.02)
Ethnic density in year 7					0.18***	(0.02)	0.41***	(0.03)	0.41***	(0.03)

Average poverty in year 7					-0.73***	(0.03)	-1.16***	(0.05)	-1.15***	(0.05)
Change in school ethnic minority density							0.33***	(0.03)	0.26***	(0.03)
Change in school average poverty							-0.61***	(0.06)	-0.75***	(0.06)
Change in school ethnic minority density sq.									-0.22***	(0.04)
Change in school average poverty sq.									-1.85***	(0.15)
Level 2 variance	0.08***	(0.00)	0.08***	(0.00)	0.06***	(0.00)	0.06***	(0.00)	0.06***	(0.00)
Level 1 variance	0.52***	(0.00)	0.52***	(0.00)	0.52***	(0.00)	0.52***	(0.00)	0.52***	(0.00)
ICC	0.13		0.13		0.11		0.11		0.10	
AIC	1107095		1106764		1106111		1105969		1105698	
BIC	1107273		1106964		1106334		1106214		1105965	

	Model 6		Model 7		Model 8	
	b	**s.e.**	**b**	**s.e.**	**b**	**s.e.**
Ethnic group (ref=White British)						
Bangladeshi	0.19***	(0.01)	0.19***	(0.01)	0.19***	(0.01)
Indian	0.23***	(0.01)	0.23***	(0.01)	0.23***	(0.01)
Pakistani	0.10***	(0.01)	0.10***	(0.01)	0.10***	(0.01)
African	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)
Caribbean	-0.04***	(0.01)	-0.05***	(0.01)	-0.04***	(0.01)
White Other	0.10***	(0.01)	0.08***	(0.01)	0.10***	(0.01)
Chinese	0.38***	(0.02)	0.40***	(0.02)	0.38***	(0.02)
Mixed	0.01	(0.01)	0.01*	(0.01)	0.01	(0.01)
Other ethnicity	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)
Female	0.07***	(0.00)	0.07***	(0.00)	0.07***	(0.00)
Student poverty (grand mean centred)	-0.47***	(0.01)	-0.46***	(0.01)	-0.46***	(0.01)
Age in months (grand mean centred)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Standardised KS2 maths level	0.15***	(0.00)	0.15***	(0.00)	0.15***	(0.00)
School size (mean centred)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Girls only school	0.15***	(0.02)	0.15***	(0.02)	0.15***	(0.02)
Ethnic density in year 7	0.41***	(0.03)	0.41***	(0.03)	0.41***	(0.03)
Average poverty in year 7	-1.15***	(0.05)	-1.15***	(0.05)	-1.15***	(0.05)
Change in school ethnic minority density	0.23***	(0.04)	0.26***	(0.03)	0.24***	(0.04)
Change in school average poverty	-0.74***	(0.06)	-0.73***	(0.06)	-0.72***	(0.06)
Change in school ethnic minority density sq.	-0.37***	(0.06)	-0.28***	(0.04)	-0.31***	(0.06)
Change in school average poverty sq.	-1.91***	(0.15)	-2.61***	(0.18)	-2.58***	(0.18)
Interactions with change in school minority density						
Bangladeshi	0.05	(0.11)			-0.03	(0.13)
Indian	-0.02	(0.08)			0.02	(0.08)
Pakistani	0.04	(0.07)			0.05	(0.08)
African	0.07	(0.07)			0.08	(0.07)
Caribbean	0.17+	(0.10)			0.17	(0.11)
White Other	0.15*	(0.07)			0.15+	(0.08)
Chinese	-0.41+	(0.22)			-0.34	(0.23)

Mixed	-0.00	(0.06)			-0.03	(0.07)
Other ethnicity	0.07	(0.05)			0.07	(0.05)
Interactions with change in school minority density sq.						
Bangladeshi	0.66***	(0.20)			0.29	(0.25)
Indian	0.28+	(0.16)			0.03	(0.18)
Pakistani	0.21+	(0.13)			-0.12	(0.16)
African	0.43**	(0.14)			0.24	(0.16)
Caribbean	0.45*	(0.22)			0.34	(0.27)
White Other	0.15	(0.12)			0.07	(0.13)
Chinese	-0.10	(0.50)			-0.15	(0.54)
Mixed	0.30*	(0.13)			0.14	(0.15)
Other ethnicity	0.25*	(0.11)			0.10	(0.12)
Interactions with change in school average poverty						
Bangladeshi			0.31	(0.27)	0.34	(0.33)
Indian			-0.28	(0.22)	-0.29	(0.23)
Pakistani			-0.06	(0.17)	-0.13	(0.21)
African			-0.11	(0.17)	-0.16	(0.18)
Caribbean			0.08	(0.23)	-0.04	(0.25)
White Other			0.04	(0.16)	-0.06	(0.17)
Chinese			-0.90+	(0.54)	-0.64	(0.56)
Mixed			0.02	(0.14)	0.08	(0.15)
Other ethnicity			-0.09	(0.13)	-0.14	(0.14)
Interactions with change in school average poverty sq.						
Bangladeshi			3.46***	(0.84)	2.80**	(1.07)
Indian			3.36**	(1.04)	3.35**	(1.16)
Pakistani			2.86***	(0.75)	3.39***	(0.91)
African			2.14***	(0.60)	1.70*	(0.67)
Caribbean			1.86+	(0.95)	1.10	(1.17)
White Other			1.30*	(0.63)	1.27+	(0.65)
Chinese			-0.13	(2.24)	-0.03	(2.37)
Mixed			1.78***	(0.51)	1.54**	(0.57)
Other ethnicity			1.92***	(0.50)	1.78**	(0.54)

Constant	1.84***	(0.01)	1.85***	(0.01)	1.84***	(0.01)
Level 2 variance	0.06***	(0.00)	0.06***	(0.00)	0.06***	(0.00)
Level 1 variance	0.52***	(0.00)	0.52***	(0.00)	0.52***	(0.00)
ICC	0.10		0.10		0.10	
AIC	1105689		1105649		1105663	
BIC	1106157		1106116		1106330	

*Notes: Standard errors are in parentheses. Significance stars: + p<0.1, * p<0.05, ** p<0.01, ***p<0.001. There are 500,307 students from 3385 schools in all models.*

Table 25 Full models predicting progress in English between Key Stage 2 and Key Stage 3 (ch.2)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	b	**s.e.**	**b**	**s.e.**	**b**	**s.e.**	**b**	**s.e.**	**b**	**s.e.**
Ethnic group (ref=White British)										
Bangladeshi	0.13***	(0.01)	0.13***	(0.01)	0.13***	(0.01)	0.13***	(0.01)	0.13***	(0.01)
Indian	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)	0.14***	(0.01)	0.13***	(0.01)
Pakistani	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)
African	0.11***	(0.01)	0.10***	(0.01)	0.11***	(0.01)	0.10***	(0.01)	0.11***	(0.01)
Caribbean	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
White Other	0.09***	(0.01)	0.09***	(0.01)	0.09***	(0.01)	0.09***	(0.01)	0.09***	(0.01)
Chinese	0.23***	(0.02)	0.22***	(0.02)	0.22***	(0.02)	0.22***	(0.02)	0.22***	(0.02)
Mixed	0.03***	(0.00)	0.03***	(0.00)	0.03***	(0.00)	0.03***	(0.00)	0.03***	(0.00)
Other ethnicity	0.06***	(0.00)	0.06***	(0.00)	0.06***	(0.00)	0.06***	(0.00)	0.06***	(0.00)
Female	0.21***	(0.00)	0.21***	(0.00)	0.21***	(0.00)	0.21***	(0.00)	0.21***	(0.00)
Student poverty (grand mean centred)	-0.45***	(0.01)	-0.44***	(0.01)	-0.43***	(0.01)	-0.43***	(0.01)	-0.43***	(0.01)
Age in months (grand mean centred)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Standardised KS2 English level	-0.13***	(0.00)	-0.13***	(0.00)	-0.13***	(0.00)	-0.13***	(0.00)	-0.13***	(0.00)
School size (mean centred)			0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Girls only school			0.21***	(0.02)	0.20***	(0.02)	0.16***	(0.02)	0.16***	(0.02)
Ethnic density in year 7					0.11***	(0.01)	0.33***	(0.03)	0.32***	(0.03)

Average poverty in year 7					-0.39***	(0.03)	-0.69***	(0.05)	-0.68***	(0.05)
Change in school ethnic minority density							0.29***	(0.03)	0.23***	(0.03)
Change in school average poverty							-0.38***	(0.06)	-0.49***	(0.06)
Change in school ethnic minority density sq.									-0.15***	(0.04)
Change in school average poverty sq.									-1.65***	(0.13)
Constant	1.10***	(0.01)	1.11***	(0.01)	1.18***	(0.01)	1.21***	(0.01)	1.21***	(0.01)
Level 2 variance	0.08***	(0.00)	0.08***	(0.00)	0.08***	(0.00)	0.07***	(0.00)	0.07***	(0.00)
Level 1 variance	0.39***	(0.00)	0.39***	(0.00)	0.39***	(0.00)	0.39***	(0.00)	0.39***	(0.00)
ICC	0.18		0.17		0.16		0.16		0.16	
AIC	956929		956627		956394		956315		956053	
BIC	957107		956827		956617		956559		956320	

	Model 6		Model 7		Model 8	
	b	**s.e.**	**b**	**s.e.**	**b**	**s.e.**
Ethnic group (ref=White British)						
Bangladeshi	0.13***	(0.01)	0.13***	(0.01)	0.13***	(0.01)
Indian	0.13***	(0.01)	0.13***	(0.01)	0.13***	(0.01)
Pakistani	0.03***	(0.01)	0.02***	(0.01)	0.03***	(0.01)
African	0.11***	(0.01)	0.10***	(0.01)	0.11***	(0.01)
Caribbean	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
White Other	0.11***	(0.01)	0.09***	(0.01)	0.10***	(0.01)
Chinese	0.23***	(0.02)	0.22***	(0.02)	0.22***	(0.02)
Mixed	0.03***	(0.01)	0.03***	(0.00)	0.03***	(0.01)
Other ethnicity	0.06***	(0.01)	0.05***	(0.01)	0.05***	(0.01)
Female	0.21***	(0.00)	0.21***	(0.00)	0.21***	(0.00)
Student poverty (grand mean centred)	-0.43***	(0.01)	-0.43***	(0.01)	-0.43***	(0.01)
Age in months (grand mean centred)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Standardised KS2 English level	-0.13***	(0.00)	-0.13***	(0.00)	-0.13***	(0.00)
School size (mean centred)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Girls only school	0.16***	(0.02)	0.16***	(0.02)	0.16***	(0.02)
Ethnic density in year 7	0.33***	(0.03)	0.33***	(0.03)	0.33***	(0.03)
Average poverty in year 7	-0.68***	(0.05)	-0.68***	(0.05)	-0.68***	(0.05)
Change in school ethnic minority density	0.18***	(0.04)	0.24***	(0.03)	0.18***	(0.04)
Change in school average poverty	-0.49***	(0.06)	-0.47***	(0.06)	-0.45***	(0.06)
Change in school ethnic minority density sq.	-0.29***	(0.05)	-0.18***	(0.04)	-0.26***	(0.05)
Change in school average poverty sq.	-1.70***	(0.13)	-2.19***	(0.15)	-2.13***	(0.16)
Interactions with change in school minority density						
Bangladeshi	0.10	(0.09)			0.13	(0.11)
Indian	-0.02	(0.07)			-0.04	(0.07)
Pakistani	0.18**	(0.06)			0.27***	(0.07)
African	0.14*	(0.06)			0.17**	(0.06)
Caribbean	0.18*	(0.09)			0.20*	(0.10)
White Other	0.18**	(0.07)			0.20**	(0.07)
Chinese	-0.03	(0.19)			-0.08	(0.20)

Mixed	0.08	(0.05)			0.11+	(0.06)
Other ethnicity	0.05	(0.04)			0.03	(0.05)
Interactions with change in school minority density sq.						
Bangladeshi	0.51**	(0.17)			0.22	(0.22)
Indian	0.30*	(0.14)			0.11	(0.16)
Pakistani	0.26*	(0.11)			0.26+	(0.14)
African	0.40**	(0.12)			0.27+	(0.14)
Caribbean	0.49**	(0.19)			0.49*	(0.23)
White Other	0.07	(0.11)			0.02	(0.11)
Chinese	-0.24	(0.43)			-0.35	(0.46)
Mixed	0.28*	(0.12)			0.22+	(0.13)
Other ethnicity	0.23*	(0.09)			0.10	(0.10)
Interactions with change in school average poverty						
Bangladeshi			0.03	(0.23)	-0.10	(0.28)
Indian			0.10	(0.19)	0.17	(0.20)
Pakistani			-0.12	(0.15)	-0.45*	(0.18)
African			-0.19	(0.14)	-0.32*	(0.16)
Caribbean			0.04	(0.19)	-0.06	(0.21)
White Other			-0.04	(0.14)	-0.18	(0.15)
Chinese			0.53	(0.40)	0.54	(0.41)
Mixed			-0.14	(0.12)	-0.19	(0.13)
Other ethnicity			0.02	(0.11)	0.02	(0.12)
Interactions with change in school average poverty sq.						
Bangladeshi			2.44***	(0.70)	1.99*	(0.91)
Indian			3.29***	(0.92)	3.01**	(1.02)
Pakistani			0.65	(0.63)	-0.04	(0.78)
African			1.50**	(0.51)	1.05+	(0.58)
Caribbean			1.26	(0.79)	0.19	(0.97)
White Other			0.90	(0.54)	0.95+	(0.56)
Chinese			1.48	(1.59)	1.84	(1.69)
Mixed			0.89*	(0.43)	0.57	(0.48)

Other ethnicity			1.75***	(0.44)	1.63***	(0.48)
Constant	1.21***	(0.01)	1.21***	(0.01)	1.21***	(0.01)
Level 2 variance	0.07***	(0.00)	0.07***	(0.00)	0.07***	(0.00)
Level 1 variance	0.39***	(0.00)	0.39***	(0.00)	0.39***	(0.00)
ICC	0.16		0.16		0.16	
AIC	956028		956027		956011	
BIC	956495		956494		956679	

*Notes: Standard errors are in parentheses. Significance stars: + p<0.1, * p<0.05, ** p<0.01, ***p<0.001. There are 500,724 students from 3366 schools in all models.*

Table 26 Repeats of model 5 for maths and English progress using multilevel ordered logistic regression (ch.2)

	Model 5 - Maths progress		Model 5 - English progress	
	b	**s.e.**	**b**	**s.e.**
Female	0.17***	(0.01)	0.66***	(0.01)
Student poverty (grand mean centred)	-1.22***	(0.02)	-1.38***	(0.02)
Age in months (grand mean centred)	0.01***	(0.00)	0.02***	(0.00)
Ethnic group (ref=White British)				
Bangladeshi	0.51***	(0.03)	0.42***	(0.03)
Indian	0.61***	(0.02)	0.43***	(0.02)
Pakistani	0.26***	(0.02)	0.08***	(0.02)
African	0.36***	(0.02)	0.33***	(0.02)
Caribbean	-0.11***	(0.03)	-0.03	(0.03)
White Other	0.22***	(0.02)	0.28***	(0.02)
Chinese	1.11***	(0.05)	0.72***	(0.05)
Mixed	0.04**	(0.02)	0.09***	(0.02)
Other	0.29***	(0.02)	0.18***	(0.02)
KS2 prior attainment level (standardised)	0.40***	(0.00)	-0.42***	(0.00)
School size (mean centred)	0.00***	(0.00)	0.00***	(0.00)
Girls only school	0.42***	(0.05)	0.53***	(0.06)
Ethnic minority density in year 7	1.11***	(0.07)	1.05***	(0.09)
Average poverty in year 7	-3.10***	(0.13)	-2.21***	(0.16)
Change in school ethnic minority density	0.72***	(0.09)	0.76***	(0.11)
Change in school average poverty	-2.05***	(0.15)	-1.61***	(0.19)
Change in school ethnic minority density sq.	-0.59***	(0.11)	-0.50***	(0.12)
Change in school average poverty sq.	-4.93***	(0.40)	-5.31***	(0.42)
Constants (contrasts)				
0 v 1234	-3.39***	(0.03)	-2.19***	(0.03)
01 v 234	-0.96***	(0.03)	0.89***	(0.03)
012 v 34	1.64***	(0.03)	4.23***	(0.04)
0123 v 4	5.83***	(0.04)	8.19***	(0.07)
Level 2 Units	3385		3385	

Level 1 Units	500307	500724
Log Likelihood	-548591	-476395
AIC	1097233	952842
BIC	1097522	953131

*Note: Estimates displayed as logit/log-odds coefficients. Standard errors are in parentheses. Significance stars: + p<0.1, * p<0.05, ** p<0.01, ***p<0.001. There are 500,307 students from 3385 schools in all models. Models estimated using the GLLAMM procedure in STATA. Dependent variable is progress in the relevant subject measured in subject levels and ranging from 0 to 4.*

Table 27 Descriptive statistics of categorical variables used in chapter 3

Variable	N	Percentage
Aspires to university		
No	2,087	64.40
Yes	1,469	35.60
Sex		
Male	1,791	50.49
Female	1,765	49.51
Age		
Aged 14	2,334	65.81
Aged 15	1,222	34.19
Household's highest education		
No education/missing	205	5.20
Primary	836	25.90
Secondary	1,323	39.07
University	1,192	29.82
Family structure		
Both parents	2,618	74.12
Mother only	728	19.95
Father only	93	3.02
Neither parent	117	2.91
School stratum		
0-10%	622	51.01
10-30%	1,112	22.88
30-60%	802	10.47
60-100%	706	7.01
Independent	314	8.63
School is religious		
No	2,706	77.75
Yes	850	22.25
Ethnic group		
White British	2,182	77.14
White Other	215	4.34
Indian	230	3.19
Pakistani	255	3.53
Asian Other	191	2.97
African	120	1.54
Caribbean	261	4.84
Other	102	2.44

Variable	N	Percentage
Religious affiliation		
No religion	1,402.00	48.82
Christian	1,298.00	37.69
Muslim	456.00	6.02
Other (inc. Sikh)	372.00	6.37
Missing	28.00	1.1
Parents encourage hard work for school		
No	1,351	41.14
Yes	2,205	58.86
Student puts high effort into schoolwork		
No	2,758	78.52
Yes	798	21.48
Total	3,556	100.00

Note: Weighted percentages; unweighted Ns.

Table 28 Descriptive statistics of continuous variables used in chapter 3

Variable	N	Weight	Mean	S.D.	Min.	Max
Religiosity scale	3556	471874	1.90	1.04	1.00	5.00
Cognitive ability test score	3556	471874	19.24	4.52	0.00	27.00
Depression-anxiety scale	3556	471874	2.19	0.70	1.00	4.00
Internal locus of control scale	3556	471874	4.38	0.50	1.00	5.00
Bad behaviour at school scale	3556	471874	2.01	0.75	1.00	5.00
% of ethnic minority students in cohort	3556	471874	0.26	0.23	0.00	0.98
% of religiously affiliated students in cohort	3556	471874	0.50	0.22	0.19	1.00
% of students with a degree educated parent in cohort	3556	471874	0.29	0.19	0.04	0.85
Average religiosity of the cohort	3556	471874	1.90	0.56	1.22	4.01

Note: Weighted statistics; unweighted Ns.

Table 29 Correlation matrix of independent variables in chapter 3

	University aspiration	Female	Age	Household highest education	Family structure	School stratum	Religiously affiliated school	Ethnic group	Religious group
University aspiration	1.00								
Female	0.00	1.00							
Age	0.00	-0.01	1.00						
Household highest education	0.32	0.03	-0.02	1.00					
Family structure	-0.07	0.02	0.03	-0.07	1.00				
School stratum	0.19	0.15	0.02	0.11	0.00	1.00			
Religiously affiliated school	0.13	0.08	0.02	0.14	0.02	0.20	1.00		
Ethnic group	0.13	0.03	-0.01	0.04	0.05	0.34	-0.01	1.00	
Religious group	0.12	0.02	-0.02	0.02	-0.05	0.28	0.10	0.33	1.00
Religiosity scale	0.20	0.04	-0.02	0.08	-0.04	0.36	0.15	0.42	0.60
Cognitive ability test score	0.26	-0.02	0.01	0.13	-0.10	0.06	0.07	-0.04	-0.02
Depression-anxiety scale	-0.03	0.25	0.03	0.04	0.03	0.04	0.05	0.00	-0.01
Parental encouragement for hard work at school	0.17	0.00	-0.02	0.08	-0.06	0.09	0.02	0.09	0.13
Bad behaviour at school scale	0.34	-0.04	0.01	0.13	-0.04	-0.07	0.03	0.08	0.12
Internal locus of control scale	0.19	0.08	-0.01	0.06	-0.01	0.10	0.02	0.05	0.10
High effort put into school work	-0.17	-0.12	-0.02	-0.09	0.07	0.07	-0.04	0.00	-0.08
Prop. of non-White British students	0.14	0.03	0.00	-0.01	0.04	0.68	0.03	0.46	0.42
Prop. of religiously affiliated students	0.17	0.08	-0.01	0.07	-0.01	0.51	0.40	0.33	0.44
Prop. of students with a degree-educated parent	0.35	0.10	0.02	0.38	-0.07	0.40	0.34	0.08	0.07
Cohort average religiosity (std.)	0.15	0.04	-0.00	0.02	0.02	0.63	0.26	0.40	0.45

	Religiosity scale	Cognitive ability test score	Depression-anxiety scale	Parental encouragement for hard work at school	Bad behaviour at school scale	Internal locus of control scale	High effort put into school work	Prop. of non-White British students	Prop. of religiously affiliated students	Prop. of students with a degree-educated parent	Cohort average religiosity (std.)
Religiosity scale	1.00										
Cognitive ability test score	-0.04	1.00									
Depression-anxiety scale	0.01	0.01	1.00								
Parental encouragement for hard work at school	0.17	0.03	-0.11	1.00							
Bad behaviour at school scale	0.19	0.15	-0.14	0.40	1.00						
Internal locus of control scale	0.16	0.03	-0.03	0.26	0.35	1.00					
High effort put into school work	-0.12	-0.17	0.08	-0.17	-0.32	-0.30	1.00				
Prop. of non-White British students	0.49	-0.02	0.00	0.10	0.13	0.07	-0.03	1.00			
Prop. of religiously affiliated students	0.49	0.00	0.02	0.12	0.14	0.08	-0.07	0.71	1.00		
Prop. of students with a degree-educated parent	0.08	0.21	0.07	0.05	0.07	0.04	-0.12	0.08	0.22	1.00	
Cohort average religiosity (std.)	0.56	-0.02	0.02	0.11	0.14	0.09	-0.05	0.87	0.87	0.14	1.00

Table 30 Full model tables predicting the likelihood of aspiring to university (ch.3)

	Model 1		Model 2		Model 3	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Female	-0.09	(0.09)	-0.12	(0.09)	-0.12	(0.09)
Aged 15	0.04	(0.08)	0.05	(0.08)	0.05	(0.08)
Household's highest education (ref=None/not known/Missing)						
Primary	0.66**	(0.22)	0.66**	(0.22)	0.66**	(0.22)
Secondary	0.97***	(0.21)	0.96***	(0.21)	0.95***	(0.21)
Tertiary	1.95***	(0.21)	1.93***	(0.22)	1.90***	(0.22)
Family structure (ref=Two parents)						
Mother only	-0.19+	(0.10)	-0.18+	(0.10)	-0.16	(0.10)
Father only	-0.51+	(0.27)	-0.48+	(0.28)	-0.44	(0.27)
Other adult	-0.49*	(0.23)	-0.48*	(0.23)	-0.48*	(0.23)
School ethnic density stratum (ref=0-10% ethnic minority)						
10-30% ethnic minority	0.24	(0.23)	0.22	(0.23)	0.21	(0.23)
30-60% ethnic minority	0.48*	(0.24)	0.46+	(0.24)	0.41+	(0.25)
60-100% ethnic minority	0.25	(0.26)	0.21	(0.26)	0.08	(0.26)
Independent school	1.39***	(0.32)	1.41***	(0.32)	1.39***	(0.32)
Religiously affiliated school	0.27	(0.18)	0.21	(0.18)	0.14	(0.19)
Ethnic group (ref=White British)						
White Other	0.31+	(0.17)	0.28	(0.17)	0.23	(0.17)
Indian	1.01***	(0.19)	1.07***	(0.21)	0.90***	(0.22)
Pakistani	0.55**	(0.18)	0.45+	(0.23)	0.32	(0.23)
African	0.89***	(0.18)	0.80***	(0.19)	0.60**	(0.19)
Caribbean	0.50*	(0.22)	0.42+	(0.23)	0.33	(0.23)
Other ethnicity	0.36*	(0.16)	0.35*	(0.17)	0.25	(0.17)
No ethnic group/Missing	0.43+	(0.24)	0.39	(0.24)	0.34	(0.25)
Religion (ref=No religion)						
Christian			0.32**	(0.10)	0.05	(0.11)
Muslim			0.27	(0.19)	-0.20	(0.21)
Other religion (inc. Sikh)			0.05	(0.17)	-0.21	(0.18)
Missing			-0.48	(0.50)	-0.71	(0.51)
Religiosity scale					0.25***	(0.05)
Constant	-2.19***	(0.28)	-2.28***	(0.28)	-2.55***	(0.29)
Level 2 variance	0.41***	(0.09)	0.41***	(0.09)	0.42***	(0.09)
BIC	4265		4284		4269	

	Model 4		Model 5		Model 6	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Female	-0.04	(0.09)	-0.12	(0.09)	-0.05	(0.10)
Aged 15	0.05	(0.08)	0.06	(0.09)	0.06	(0.09)
Household's highest education (ref=None/not known/Missing)						
Primary	0.61**	(0.22)	0.56*	(0.23)	0.50*	(0.23)
Secondary	0.91***	(0.22)	0.86***	(0.22)	0.78***	(0.23)
Tertiary	1.87***	(0.22)	1.81***	(0.22)	1.74***	(0.23)
Family structure (ref=Two parents)						
Mother only	-0.15	(0.11)	-0.10	(0.11)	-0.10	(0.11)
Father only	-0.44	(0.28)	-0.37	(0.29)	-0.41	(0.30)
Other adult	-0.28	(0.24)	-0.31	(0.24)	-0.38	(0.25)
School ethnic density stratum (ref=0-10% ethnic minority)						
10-30% ethnic minority	0.13	(0.21)	0.15	(0.21)	0.12	(0.23)
30-60% ethnic minority	0.34	(0.23)	0.40+	(0.23)	0.40	(0.24)
60-100% ethnic minority	0.09	(0.25)	0.08	(0.25)	-0.02	(0.26)
Independent school	1.13***	(0.30)	1.12***	(0.30)	1.32***	(0.32)
Religiously affiliated school	0.13	(0.17)	0.16	(0.17)	0.16	(0.18)
Ethnic group (ref=White British)						
White Other	0.24	(0.18)	0.27	(0.18)	0.29	(0.19)
Indian	0.80***	(0.22)	0.73***	(0.22)	0.78***	(0.23)
Pakistani	0.27	(0.24)	0.35	(0.24)	0.34	(0.25)
African	0.74***	(0.20)	0.76***	(0.20)	0.71***	(0.22)
Caribbean	0.42+	(0.23)	0.50*	(0.24)	0.56*	(0.25)
Other ethnicity	0.22	(0.17)	0.26	(0.17)	0.29	(0.18)
No ethnic group/Missing	0.29	(0.25)	0.27	(0.25)	0.18	(0.27)
Religion (ref=No religion)						
Christian	0.04	(0.12)	0.01	(0.12)	-0.01	(0.12)
Muslim	-0.12	(0.22)	-0.18	(0.22)	-0.18	(0.23)
Other religion (inc. Sikh)	-0.18	(0.18)	-0.19	(0.18)	-0.20	(0.19)
Missing	-0.62	(0.53)	-0.70	(0.54)	-0.62	(0.57)
Religiosity scale	0.28***	(0.05)	0.24***	(0.05)	0.20***	(0.06)
Cognitive ability (std.)	0.60***	(0.05)	0.56***	(0.05)	0.52***	(0.05)
Depression-anxiety scale	-0.19**	(0.06)	-0.12+	(0.06)	-0.06	(0.06)
Parental encouragement for hard work at school			0.55***	(0.09)	0.03	(0.10)
Bad behaviour at school scale			-0.28***	(0.06)	-0.02	(0.07)
Internal locus of control scale					1.58***	(0.11)
High effort into school work					0.30**	(0.11)
Constant	-2.20***	(0.31)	-2.01***	(0.34)	-9.29***	(0.63)
Level 2 variance	0.34***	(0.08)	0.33***	(0.08)	0.38***	(0.09)
BIC	4130		4076		3827	

	Model 7		Model 8		Model 9	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Female	-0.05	(0.10)	-0.05	(0.10)	-0.05	(0.10)
Aged 15	0.06	(0.09)	0.06	(0.09)	0.05	(0.09)
Household's highest education (ref=None/not known/Missing)						
Primary	0.52*	(0.23)	0.52*	(0.23)	0.52*	(0.23)
Secondary	0.75***	(0.23)	0.75***	(0.23)	0.76***	(0.23)
Tertiary	1.63***	(0.23)	1.63***	(0.23)	1.63***	(0.23)
Family structure (ref=Two parents)						
Mother only	-0.08	(0.11)	-0.08	(0.11)	-0.08	(0.11)
Father only	-0.37	(0.30)	-0.37	(0.30)	-0.37	(0.30)
Other adult	-0.42+	(0.25)	-0.41+	(0.25)	-0.41+	(0.25)
School ethnic density stratum (ref=0-10% ethnic minority)						
10-30% ethnic minority	-0.29	(0.19)	-0.30	(0.19)	-0.30	(0.19)
30-60% ethnic minority	-0.51+	(0.27)	-0.49+	(0.27)	-0.49+	(0.27)
60-100% ethnic minority	-1.13**	(0.38)	-1.03**	(0.38)	-1.02**	(0.38)
Independent school	-0.12	(0.32)	-0.12	(0.32)	-0.13	(0.32)
Religiously affiliated school	-0.16	(0.18)	-0.11	(0.18)	-0.10	(0.18)
Ethnic group (ref=White British)						
White Other	0.29	(0.19)	0.28	(0.19)	1.06*	(0.45)
Indian	0.73**	(0.23)	0.72**	(0.23)	1.70**	(0.57)
Pakistani	0.36	(0.25)	0.37	(0.25)	0.17	(0.73)
African	0.69**	(0.21)	0.67**	(0.21)	0.37	(0.63)
Caribbean	0.54*	(0.24)	0.53*	(0.24)	0.97	(0.61)
Other ethnicity	0.25	(0.18)	0.23	(0.18)	0.13	(0.39)
No ethnic group/Missing	0.08	(0.27)	0.07	(0.27)	0.58	(0.61)
Religion (ref=No religion)						
Christian	-0.03	(0.12)	-0.05	(0.12)	-0.08	(0.13)
Muslim	-0.20	(0.23)	-0.20	(0.23)	-0.22	(0.23)
Other religion (inc. Sikh)	-0.26	(0.19)	-0.27	(0.19)	-0.29	(0.20)
Missing	-0.63	(0.57)	-0.64	(0.57)	-0.68	(0.58)
Religiosity scale	0.19***	(0.06)	0.20***	(0.06)	0.27***	(0.08)
Cognitive ability (std.)	0.50***	(0.05)	0.50***	(0.05)	0.50***	(0.05)
Depression-anxiety scale	-0.07	(0.06)	-0.06	(0.06)	-0.06	(0.06)
Parental encouragement for hard work at school	0.03	(0.10)	0.03	(0.10)	0.04	(0.10)
Bad behaviour at school scale	-0.02	(0.06)	-0.02	(0.06)	-0.02	(0.07)
Internal locus of control scale	1.57***	(0.11)	1.57***	(0.11)	1.58***	(0.11)
High effort into school work	0.31**	(0.11)	0.31**	(0.11)	0.32**	(0.11)
Prop. of non-White British students (std.)	0.32*	(0.14)	0.43**	(0.16)	0.44**	(0.16)
Prop. of religiously affiliated students (std.)	0.11	(0.11)	0.24+	(0.13)	0.24+	(0.13)
Prop. of students with a degree-educated parent (std.)	0.51***	(0.08)	0.52***	(0.08)	0.51***	(0.08)
Cohort average religiosity (std.)			-0.29	(0.18)	-0.30	(0.18)

	Model 7		Model 8		Model 9	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Interactions						
White Other x individual religiosity					-0.32+	(0.17)
Indian x individual religiosity					-0.34+	(0.17)
Pakistani x individual religiosity					0.02	(0.19)
African x individual religiosity					0.05	(0.18)
Caribbean x individual religiosity					-0.19	(0.21)
Other ethnicity x individual religiosity					0.01	(0.14)
No ethnic group/Missing x individual religiosity					-0.21	(0.21)
Constant	-8.37***	(0.63)	-8.44***	(0.63)	-8.59***	(0.64)
Level 2 variance	0.16***	(0.05)	0.15***	(0.05)	0.15***	(0.05)
BIC	3802		3808		3856	

*Notes: Logit coefficients. Standard errors are in parentheses. Significance stars: + p<0.1, * p<0.05, ** p<0.01, ***p<0.001. There are 3,556 students from 107 schools in all models.*

Table 31 Descriptive statistics of categorical variables used in chapter 4

Variable	N	Percentage
Put effort into schoolwork		
No	2,910	78.95
Yes	830	21.05
Grades very important		
No	1,378	40.65
Yes	2,362	59.35
Sex		
Male	1,891	51.41
Female	1,849	48.59
Age		
Aged 14	2,436	65.99
Aged 15	1,304	34.01
School stratum		
0-10%	657	51.72
10-30%	1,140	25.00
30-60%	840	14.20
60-100%	775	7.14
Independent	328	1.93
Household's highest education		
No education/missing	241	6.23
Primary	868	27.13
Secondary	1,389	39.87
University	1,242	26.77
Family structure		
Both parents	2,752	74.47
Mother only	762	19.63
Father only	100	3.13
Neither parent	126	2.77
Ethnic group		
White British	2,257	76.55
White Other	230	4.19
Indian	235	3.14
Pakistani	275	4.02
Asian Other	214	3.35
African	129	1.72
Caribbean	284	4.53
Other	116	2.51
Parental closure		
No	3,352	91.63
Yes	388	8.37

Variable	N	Percentage
Parents know at least 1 classmate		
No	1,006	22.51
Yes	2,734	77.49
All nominated friends from school		
No	1,844	44.90
Yes	1,896	55.10
Total	3,740	100.00

Note: Weighted percentages; unweighted Ns.

Table 32 Descriptive statistics of continuous variables used in chapter 4

Variable	N	Weight	Mean	S.D.	Min.	Max
Cognitive ability test score	3740	350760	19.12	4.38	0.00	27.00
Parental encouragement scale	3740	350760	4.41	0.65	1.00	5.00
Parental care scale	3740	350760	4.13	0.73	1.00	5.00
Parental monitoring scale	3740	350760	3.15	0.94	1.00	5.00
Parental severity scale	3740	350760	2.59	0.86	1.00	5.00
% of students with parental closure	3740	350760	0.08	0.05	0.00	0.32
% of ethnic minority students in cohort	3740	350760	0.22	0.22	0.00	0.96
% of students with a degree educated parent in the cohort	3740	350760	0.27	0.17	0.04	0.85

Note: Weighted statistics; unweighted Ns.

Table 33 Correlation matrix of independent variables in chapter 4

	Female	Age	Cog. ability	Ethnicity	Parents' ed.	Family type	Encouragement	Monitoring	Care	Severity
Female	1.00									
Age	0.00	1.00								
Cognitive ability test score	-0.03	0.00	1.00							
Ethnic group	0.02	-0.01	-0.04	1.00						
Parents' highest education	0.04	-0.01	0.13	0.04	1.00					
Family type	0.01	0.03	-0.10	0.05	-0.06	1.00				
Encouragement for school scale	0.00	-0.02	0.04	0.04	0.12	-0.06	1.00			
Monitoring scale	0.12	-0.03	-0.04	0.12	0.04	-0.01	0.17	1.00		
Care scale	0.01	0.00	-0.01	-0.02	0.09	-0.05	0.59	0.10	1.00	
Severity scale	-0.05	-0.03	-0.03	0.07	-0.02	-0.01	-0.20	0.25	-0.41	1.00
Parents know a classmate	0.10	-0.01	0.15	-0.12	0.07	-0.10	0.03	0.01	0.04	0.00
All friends from school	-0.04	-0.01	-0.05	-0.02	-0.07	-0.02	0.03	-0.01	0.04	-0.02
Parental closure	0.06	0.01	-0.07	0.11	0.01	0.02	0.09	0.37	0.05	0.11
% ethnic minority students	0.03	0.00	-0.03	0.48	0.02	0.04	0.07	0.13	0.00	0.02
% students with degree educated parent	0.10	0.01	0.22	0.08	0.38	-0.06	0.06	0.01	0.02	-0.02
% students with parental closure	0.09	0.02	-0.13	0.25	-0.02	0.09	0.04	0.15	0.02	0.02
School stratum	0.13	0.01	0.04	0.34	0.09	0.02	0.06	0.09	0.01	-0.01

	Parents know a classmate	**All friends from school**	**Parental closure**	**% ethnic minority students**	**% students with degree educated parent**	**% students with parental closure**	**School stratum**
Parents know a classmate	1.00						
All friends from school	0.02	1.00					
Parental closure	0.00	-0.02	1.00				
% ethnic minority students	-0.13	-0.06	0.09	1.00			
% students with degree educated parent	0.09	-0.14	0.00	0.13	1.00		
% students with parental closure	-0.08	-0.04	0.21	0.45	-0.03	1.00	
School stratum	-0.10	-0.12	0.07	0.68	0.37	0.33	1.00

Table 34 Rotated factor loadings of parental behaviour variables (ch.4)

Variable	Factor 1 Parental care	Factor 2 Parental encouragement for school	Factor 3 Parental severity	Factor 4 Parental monitoring	Uniqueness
parquiet	-0.162	-0.043	0.487	0.087	0.727
parstrict	-0.222	0.040	0.607	0.252	0.518
parcriticise	-0.389	-0.110	0.558	0.087	0.517
parcontrol	0.051	0.061	0.273	0.535	0.633
parcomfort	0.746	0.201	-0.124	0.031	0.388
parhelp	0.765	0.242	-0.087	0.032	0.348
parshowlove	0.718	0.279	-0.153	0.040	0.381
parfeel	0.746	0.167	-0.160	0.027	0.390
pargrades	0.305	0.622	0.023	0.098	0.510
parproud	0.489	0.574	-0.116	0.011	0.418
parworkhard	0.335	0.673	0.005	0.068	0.430
parmonitor	0.135	0.154	0.168	0.533	0.646

Table 35 Full models 1-7 predicting strong agreement to the importance of school marks (ch.4)

	Model 1		Model 2		Model 3		Model 4	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Female	0.02	(0.08)	0.00	(0.08)	0.00	(0.08)	-0.01	(0.08)
Aged 15 (ref = aged 14)	-0.08	(0.07)	-0.09	(0.07)	-0.09	(0.07)	-0.06	(0.08)
Cognitive ability (std.)	0.16***	(0.04)	0.17***	(0.04)	0.17***	(0.04)	0.17***	(0.04)
Household's highest education (ref=None/not known/Missing)								
Primary	0.12	(0.16)	0.13	(0.16)	0.13	(0.16)	-0.06	(0.17)
Secondary	0.19	(0.15)	0.19	(0.15)	0.20	(0.15)	-0.02	(0.16)
Tertiary	0.29+	(0.16)	0.30+	(0.16)	0.30+	(0.16)	-0.02	(0.17)
Family structure (ref=Two parents)								
Mother only	-0.26**	(0.09)	-0.27**	(0.09)	-0.27**	(0.09)	-0.22*	(0.09)
Father only	-0.13	(0.21)	-0.09	(0.22)	-0.09	(0.22)	0.16	(0.23)
Other adult	0.20	(0.21)	0.19	(0.21)	0.18	(0.21)	0.27	(0.22)
School ethnic density stratum (ref=0-10% ethnic minority)								
10-30% ethnic minority	0.06	(0.13)	0.05	(0.13)	0.05	(0.13)	0.06	(0.13)
30-60% ethnic minority	0.11	(0.14)	0.10	(0.14)	0.10	(0.14)	0.15	(0.14)
60-100% ethnic minority	0.34*	(0.16)	0.32*	(0.16)	0.31*	(0.16)	0.19	(0.16)
Independent school	-0.20	(0.19)	-0.21	(0.18)	-0.22	(0.18)	-0.26	(0.18)
Ethnic group (ref = White British)								
White Other	0.07	(0.15)	0.04	(0.15)	0.03	(0.15)	0.11	(0.16)
Indian	0.74***	(0.18)	0.72***	(0.18)	0.72***	(0.18)	0.72***	(0.19)
Pakistani	0.63***	(0.16)	0.63***	(0.16)	0.63***	(0.16)	0.63***	(0.17)
African	0.78***	(0.18)	0.71***	(0.18)	0.71***	(0.18)	0.67***	(0.19)
Caribbean	0.31	(0.20)	0.27	(0.21)	0.26	(0.21)	0.27	(0.22)
Other	0.57***	(0.15)	0.55***	(0.15)	0.54***	(0.15)	0.61***	(0.16)
No ethnic group/Missing	0.33	(0.21)	0.29	(0.21)	0.29	(0.21)	0.28	(0.22)
Parental closure			0.60***	(0.13)	0.61***	(0.13)	0.31*	(0.14)
Parents know at least one classmate					-0.04	(0.08)	-0.09	(0.09)
All nominated friends from in school					-0.02	(0.07)	-0.07	(0.08)
Parental encouragement scale (std.)							0.69***	(0.05)
Parental care scale (std.)							-0.00	(0.05)
Parental monitoring scale (std.)							0.12**	(0.04)
Parental severity scale (std.)							0.01	(0.04)
Constant	0.13	(0.18)	0.10	(0.18)	0.14	(0.19)	0.47*	(0.20)
Level 2 variance	0.08***	(0.03)	0.07***	(0.03)	0.07***	(0.03)	0.06***	(0.03)
BIC	4952		4937		4953		4640	

	Model 5		Model 6		Model 7	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Female	-0.02	(0.08)	-0.01	(0.08)	-0.00	(0.08)
Aged 15 (ref = aged 14)	-0.06	(0.08)	-0.06	(0.08)	-0.06	(0.08)
Cognitive ability (std.)	0.17***	(0.04)	0.17***	(0.04)	0.17***	(0.04)
Household's highest education (ref=None/not known/Missing)						
Primary	-0.07	(0.17)	-0.06	(0.17)	-0.07	(0.17)
Secondary	-0.03	(0.16)	-0.03	(0.16)	-0.03	(0.16)
Tertiary	-0.02	(0.17)	-0.01	(0.17)	-0.00	(0.17)
Family structure (ref=Two parents)						
Mother only	-0.23*	(0.09)	-0.23*	(0.09)	-0.25**	(0.09)
Father only	0.15	(0.23)	0.15	(0.23)	0.15	(0.23)
Other adult	0.25	(0.22)	0.25	(0.22)	0.24	(0.22)
School ethnic density stratum (ref=0-10% ethnic minority)						
10-30% ethnic minority	0.04	(0.13)	0.03	(0.13)	0.06	(0.13)
30-60% ethnic minority	0.07	(0.15)	-0.02	(0.18)	0.06	(0.18)
60-100% ethnic minority	0.08	(0.17)	-0.09	(0.24)	-0.08	(0.24)
Independent school	-0.29	(0.18)	-0.27	(0.22)	-0.24	(0.22)
Ethnic group (ref = White British)						
White Other	0.10	(0.16)	0.09	(0.16)	0.11	(0.16)
Indian	0.73***	(0.19)	0.69***	(0.19)	0.70***	(0.19)
Pakistani	0.64***	(0.17)	0.60***	(0.17)	0.64***	(0.18)
African	0.66***	(0.19)	0.63***	(0.19)	0.56**	(0.20)
Caribbean	0.26	(0.22)	0.24	(0.22)	-0.02	(0.24)
Other	0.60***	(0.16)	0.58***	(0.16)	0.63***	(0.16)
No ethnic group/Missing	0.27	(0.22)	0.26	(0.22)	0.28	(0.23)
Parental closure	0.28*	(0.14)	0.29*	(0.14)	0.28*	(0.14)
Parents know at least one classmate	-0.09	(0.09)	-0.08	(0.09)	-0.08	(0.09)
All nominated friends from in school	-0.07	(0.08)	-0.07	(0.08)	-0.07	(0.08)
Parental encouragement scale (std.)	0.69***	(0.05)	0.69***	(0.05)	0.68***	(0.05)
Parental care scale (std.)	-0.00	(0.05)	-0.00	(0.05)	-0.01	(0.05)
Parental monitoring scale (std.)	0.12**	(0.04)	0.12**	(0.04)	0.12**	(0.04)
Parental severity scale (std.)	0.01	(0.04)	0.01	(0.04)	0.00	(0.04)
Prop. of students with parental closure (std.)	0.09+	(0.05)	0.09+	(0.05)	0.01	(0.06)
Prop. of ethnic minority students (std.)			0.09	(0.09)	0.08	(0.09)
Prop. of students with a degree-educated parent (std.)			-0.05	(0.06)	-0.05	(0.06)
Interactions - school cohort parental closure X group						
White Other					0.09	(0.15)
Indian					0.27	(0.20)
Pakistani					0.00	(0.17)
African					0.38*	(0.17)
Caribbean					0.78***	(0.23)
Other					0.02	(0.13)
No ethnic group/Missing					0.08	(0.22)
Constant	0.54**	(0.20)	0.60**	(0.22)	0.53*	(0.22)
Level 2 variance	0.05***	(0.03)	0.05***	(0.03)	0.04***	(0.03)
BIC	4645		4660		4699	

*Note: + p<0.10, *p<0.05, ** p<0.01, ***p<0.001. There are 3740 students from 107 schools in all models.*

Table 36 Full models 1-7 predicting strong agreement to putting a great deal of effort into school work (ch.4)

	Model 1		Model 2		Model 3		Model 4	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Female	0.45***	(0.09)	0.43***	(0.09)	0.43***	(0.09)	0.41***	(0.09)
Aged 15 (ref = aged 14)	-0.07	(0.08)	-0.07	(0.09)	-0.07	(0.09)	-0.05	(0.09)
Cognitive ability (std.)	0.09+	(0.05)	0.10*	(0.05)	0.10*	(0.05)	0.11*	(0.05)
Household's highest education (ref=None/not known/Missing)								
Primary	0.27	(0.20)	0.28	(0.20)	0.27	(0.20)	0.10	(0.21)
Secondary	0.44*	(0.19)	0.45*	(0.20)	0.45*	(0.20)	0.24	(0.21)
Tertiary	0.49*	(0.20)	0.50*	(0.20)	0.49*	(0.20)	0.19	(0.21)
Family structure (ref=Two parents)								
Mother only	-0.13	(0.11)	-0.14	(0.11)	-0.14	(0.11)	-0.10	(0.11)
Father only	-0.51+	(0.30)	-0.45	(0.30)	-0.45	(0.30)	-0.23	(0.31)
Other adult	0.28	(0.21)	0.27	(0.21)	0.28	(0.21)	0.37	(0.22)
School ethnic density stratum (ref=0-10% ethnic minority)								
10-30% ethnic minority	-0.09	(0.14)	-0.09	(0.14)	-0.09	(0.14)	-0.07	(0.14)
30-60% ethnic minority	0.03	(0.15)	0.01	(0.16)	0.02	(0.16)	0.06	(0.16)
60-100% ethnic minority	0.19	(0.16)	0.16	(0.17)	0.17	(0.17)	0.11	(0.17)
Independent school	0.00	(0.19)	-0.00	(0.19)	0.01	(0.20)	-0.00	(0.19)
Ethnic group (ref = White British)								
White Other	0.25	(0.17)	0.21	(0.17)	0.22	(0.17)	0.28	(0.18)
Indian	0.61***	(0.17)	0.58***	(0.17)	0.58***	(0.17)	0.58***	(0.17)
Pakistani	-0.07	(0.18)	-0.08	(0.18)	-0.08	(0.18)	-0.16	(0.19)
African	0.32+	(0.18)	0.24	(0.18)	0.24	(0.18)	0.24	(0.19)
Caribbean	-0.24	(0.25)	-0.29	(0.25)	-0.29	(0.25)	-0.37	(0.26)
Other	0.04	(0.16)	0.02	(0.16)	0.02	(0.16)	0.06	(0.17)
No ethnic group/Missing	0.40+	(0.22)	0.35	(0.22)	0.35	(0.22)	0.38+	(0.23)
Parental closure			0.57***	(0.12)	0.57***	(0.12)	0.24+	(0.14)
Parents know at least one classmate					0.03	(0.10)	0.00	(0.10)
All nominated friends from in school					0.03	(0.08)	-0.04	(0.09)
Parental encouragement scale (std.)							0.64***	(0.07)
Parental care scale (std.)							0.37***	(0.06)
Parental monitoring scale (std.)							0.19***	(0.05)
Parental severity scale (std.)							-0.09+	(0.05)
Constant	-1.97***	(0.22)	-2.01***	(0.22)	-2.04***	(0.24)	-1.98***	(0.25)
Level 2 variance	0.05***	(0.03)	0.05***	(0.03)	0.05***	(0.03)	0.03***	(0.03)
BIC	4043		4030		4046		3746	

	Model 5		Model 6		Model 7	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Female	0.42***	(0.09)	0.42***	(0.09)	0.42***	(0.09)
Aged 15 (ref = aged 14)	-0.05	(0.09)	-0.05	(0.09)	-0.05	(0.09)
Cognitive ability (std.)	0.10*	(0.05)	0.10*	(0.05)	0.10*	(0.05)
Household's highest education (ref=None/not known/Missing)						
Primary	0.11	(0.21)	0.11	(0.21)	0.10	(0.22)
Secondary	0.26	(0.21)	0.26	(0.21)	0.24	(0.21)
Tertiary	0.20	(0.21)	0.20	(0.21)	0.19	(0.21)
Family structure (ref=Two parents)						
Mother only	-0.10	(0.11)	-0.10	(0.11)	-0.10	(0.11)
Father only	-0.23	(0.31)	-0.24	(0.31)	-0.23	(0.31)
Other adult	0.38+	(0.22)	0.38+	(0.22)	0.39+	(0.22)
School ethnic density stratum (ref=0-10% ethnic minority)						
10-30% ethnic minority	-0.06	(0.14)	-0.06	(0.15)	-0.05	(0.15)
30-60% ethnic minority	0.12	(0.16)	0.09	(0.20)	0.11	(0.20)
60-100% ethnic minority	0.18	(0.18)	0.14	(0.27)	0.14	(0.27)
Independent school	0.01	(0.19)	0.02	(0.24)	0.07	(0.24)
Ethnic group (ref = White British)						
White Other	0.28	(0.18)	0.28	(0.18)	0.23	(0.19)
Indian	0.57***	(0.17)	0.56**	(0.18)	0.61***	(0.18)
Pakistani	-0.16	(0.19)	-0.17	(0.19)	-0.10	(0.19)
African	0.26	(0.19)	0.25	(0.19)	0.34	(0.21)
Caribbean	-0.35	(0.26)	-0.36	(0.26)	-0.30	(0.30)
Other	0.07	(0.17)	0.06	(0.17)	-0.00	(0.18)
No ethnic group/Missing	0.39+	(0.23)	0.39+	(0.23)	0.32	(0.25)
Parental closure	0.27+	(0.14)	0.27+	(0.14)	0.26+	(0.14)
Parents know at least one classmate	-0.00	(0.10)	0.00	(0.10)	0.00	(0.10)
All nominated friends from in school	-0.04	(0.09)	-0.04	(0.09)	-0.05	(0.09)
Parental encouragement scale (std.)	0.64***	(0.07)	0.64***	(0.07)	0.64***	(0.07)
Parental care scale (std.)	0.38***	(0.06)	0.38***	(0.06)	0.38***	(0.07)
Parental monitoring scale (std.)	0.19***	(0.05)	0.19***	(0.05)	0.19***	(0.05)
Parental severity scale (std.)	-0.09+	(0.05)	-0.09+	(0.05)	-0.09+	(0.05)
Prop. of students with parental closure (std.)	-0.06	(0.05)	-0.07	(0.05)	-0.12+	(0.07)
Prop. of ethnic minority students (std.)			0.02	(0.09)	0.01	(0.09)
Prop. of students with a degree-educated parent (std.)			-0.01	(0.06)	-0.01	(0.06)
Interactions - school cohort parental closure X group						
White Other					0.31+	(0.16)
Indian					-0.04	(0.17)
Pakistani					-0.13	(0.18)
African					-0.02	(0.16)
Caribbean					0.01	(0.24)
Other					0.28+	(0.15)
No ethnic group/Missing					0.30	(0.22)
Constant	-2.03***	(0.25)	-2.02***	(0.27)	-2.03***	(0.27)
Level 2 variance	0.03***	(0.03)	0.03***	(0.03)	0.03***	(0.03)
BIC	3753		3769		3817	

*Note: + p<0.10, *p<0.05, ** p<0.01, ***p<0.001. There are 3740 students from 107 schools in all models.*

Table 37 Descriptive statistics of categorical variables used in chapter 5

Variable	N	Percentage
Sex		
Male	1,938	50.83
Female	1,792	49.17
Age		
Aged 14	2,419	65.03
Aged 15	1,311	34.97
Mother's highest education		
No education	63	0.85
Primary	1,197	34.73
Secondary	1,340	36.44
University	790	19.68
Missing	340	8.3
Father's highest education		
No education	43	0.63
Primary	1,048	31.78
Secondary	1,226	34.07
University	876	18.93
Missing	537	14.6
Ethnic group		
White British	2,300	77.88
White Other	190	3.33
Indian	207	2.84
Pakistani	267	3.5
Asian Other	176	3.27
African	304	4.52
Caribbean	117	1.77
Other	169	2.87
School stratum		
0-10%	667	52.43
10-30%	1,157	22.59
30-60%	838	10.22
60-100%	769	7.46
Independent	299	7.3
Additional language		
No	2,561	82.28
Yes	1,169	17.72
Total	3730	100

Note: Weighted percentages; unweighted Ns.

Table 38 Descriptive statistics of continuous variables used in chapter 5

Variable	N	Weight	Mean	S.D.	Min.	Max
Language test score	3730	501717	16.91	3.51	1.00	25.00
Cognitive ability test score	3730	501717	19.09	4.43	0.00	27.00
Duration of residence	3730	501717	13.60	2.76	0.00	15.00
Cohort average duration of residence	3730	501717	13.62	1.12	8.16	14.46
% of students with an L1 in cohort	3730	501717	17.93	21.40	0.00	94.74
% of students with a degree educated parent in the cohort	3730	501717	29.19	18.39	4.00	85.37

Note: Weighted statistics; unweighted Ns.

Table 39 Correlation matrix of independent variables in chapter 5

	L2 test score	Female	Age	Mother's highest education	Father's highest education	Ethnic group	Duration of residence	Has an additional language (L1)	Avg. duration of residence of cohort	% students with an L1 in cohort	% students with a degree educated parent in cohort	School stratum	Cognitive ability
L2 test score	1.00												
Female	0.00	1.00											
Age	0.00	0.01	1.00										
Mother's highest education	-0.01	-0.04	-0.01	1.00									
Father's highest education	-0.07	-0.02	-0.02	0.39	1.00								
Ethnic group	-0.09	-0.01	-0.01	0.07	0.11	1.00							
Duration of residence	0.29	0.00	0.09	-0.07	-0.08	-0.38	1.00						
Has an additional language (L1)	-0.15	-0.02	0.02	0.07	0.09	0.54	-0.41	1.00					
Avg. duration of residence of cohort	0.24	-0.04	-0.03	-0.04	-0.08	-0.29	0.43	-0.30	1.00				
% students with an L1 in cohort	-0.13	0.01	0.01	0.06	0.08	0.43	-0.23	0.56	-0.53	1.00			
% students with a degree-educated parent in cohort	0.28	0.09	0.01	0.14	0.13	0.09	-0.01	0.04	0.00	0.08	1.00		
School stratum	-0.02	0.12	0.02	0.09	0.09	0.33	-0.20	0.37	-0.46	0.68	0.39	1.00	
Cognitive ability	0.45	-0.01	-0.01	-0.01	-0.02	-0.05	-0.09	-0.06	0.14	-0.05	0.21	0.05	1.00

Table 40 Full model tables showing estimates of multilevel linear regression predicting L2 test score (ch.5)

	Model 1		Model 2		Model 3		Model 4	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Female	-0.05	(0.12)	-0.05	(0.11)	-0.05	(0.11)	-0.05	(0.11)
Aged 15 (ref = aged 14)	0.10	(0.11)	0.11	(0.10)	-0.08	(0.10)	-0.08	(0.10)
Mother's highest education (ref=None)								
Primary	0.54	(0.44)	0.09	(0.41)	-0.31	(0.40)	-0.32	(0.40)
Secondary	1.02*	(0.44)	0.56	(0.41)	0.22	(0.40)	0.21	(0.40)
Tertiary	1.27**	(0.45)	0.72+	(0.42)	0.42	(0.41)	0.40	(0.41)
Missing	-0.38	(0.46)	-0.67	(0.43)	-1.04*	(0.42)	-1.04*	(0.42)
Father's highest education (ref=None)								
Primary	1.28*	(0.52)	0.22	(0.48)	-0.04	(0.47)	-0.05	(0.47)
Secondary	1.18*	(0.52)	0.10	(0.48)	-0.14	(0.47)	-0.14	(0.47)
Tertiary	1.48**	(0.52)	0.42	(0.49)	0.20	(0.48)	0.20	(0.48)
Missing	0.29	(0.52)	-0.58	(0.49)	-0.80+	(0.48)	-0.80+	(0.48)
School ethnic density stratum (ref=0-10% ethnic minority)								
10-30% ethnic minority	0.72+	(0.39)	0.42	(0.31)	0.42	(0.27)	0.42	(0.27)
30-60% ethnic minority	0.10	(0.41)	-0.12	(0.33)	-0.14	(0.29)	-0.13	(0.29)
60-100% ethnic minority	-0.33	(0.43)	-0.31	(0.35)	-0.28	(0.31)	-0.25	(0.31)
Independent school	1.69**	(0.52)	0.90*	(0.42)	1.05**	(0.37)	1.05**	(0.37)
Ethnic group (ref = White British)								
White Other	-1.69***	(0.25)	-1.68***	(0.23)	-0.09	(0.25)	-0.00	(0.27)
Indian	0.14	(0.26)	0.05	(0.25)	0.47*	(0.24)	0.57*	(0.27)
Pakistani	-0.26	(0.25)	-0.22	(0.23)	0.05	(0.22)	0.15	(0.26)
Asian Other	-0.96***	(0.26)	-1.14***	(0.24)	-0.09	(0.25)	-0.00	(0.27)
African	-0.54*	(0.21)	-0.31	(0.20)	0.38+	(0.20)	0.44*	(0.21)
Caribbean	-0.17	(0.31)	-0.01	(0.29)	0.40	(0.28)	0.42	(0.28)
Other	-0.86**	(0.27)	-0.91***	(0.25)	0.34	(0.26)	0.39	(0.27)
Cognitive ability (std.)			1.40***	(0.06)	1.37***	(0.06)	1.37***	(0.06)
Duration of residence in the UK					0.27***	(0.02)	0.27***	(0.02)
Has an additional language (L1)							-0.14	(0.17)
Constant	14.93***	(0.66)	16.57***	(0.61)	13.28***	(0.62)	13.34***	(0.63)
Level 2 variance	1.48*	(0.25)	0.87	(0.16)	0.63*	(0.13)	0.63*	(0.13)
BIC	19522		18984		18785		18792	

	Model 5		Model 6		Model 7		Model 8	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Female	-0.05	(0.11)	-0.04	(0.11)	-0.05	(0.10)	-0.06	(0.10)
Aged 15 (ref = aged 14)	-0.07	(0.10)	-0.07	(0.10)	-0.06	(0.10)	-0.07	(0.10)
Mother's highest education (ref=None)								
Primary	-0.30	(0.40)	-0.30	(0.40)	-0.30	(0.40)	-0.31	(0.40)
Secondary	0.23	(0.40)	0.23	(0.40)	0.20	(0.40)	0.20	(0.40)
Tertiary	0.42	(0.41)	0.42	(0.41)	0.35	(0.41)	0.34	(0.41)
Missing	-1.02*	(0.42)	-1.02*	(0.42)	-1.01*	(0.42)	-1.03*	(0.42)
Father's highest education (ref=None)								
Primary	-0.01	(0.47)	-0.01	(0.47)	0.01	(0.47)	0.01	(0.47)
Secondary	-0.11	(0.47)	-0.10	(0.47)	-0.09	(0.47)	-0.10	(0.47)
Tertiary	0.23	(0.48)	0.24	(0.48)	0.18	(0.48)	0.19	(0.48)
Missing	-0.76	(0.48)	-0.76	(0.48)	-0.76	(0.48)	-0.75	(0.48)
School ethnic density stratum (ref=0-10% ethnic minority)								
10-30% ethnic minority	0.52+	(0.26)	0.49+	(0.27)	0.26	(0.24)	0.27	(0.24)
30-60% ethnic minority	0.13	(0.30)	0.02	(0.37)	-0.25	(0.33)	-0.22	(0.33)
60-100% ethnic minority	0.16	(0.33)	-0.00	(0.49)	-0.11	(0.43)	-0.13	(0.43)
Independent school	1.39***	(0.38)	1.33***	(0.40)	-0.00	(0.42)	0.08	(0.43)
Ethnic group (ref = White British)								
White Other	-0.01	(0.27)	-0.02	(0.27)	0.00	(0.27)	0.26	(0.29)
Indian	0.53+	(0.27)	0.52+	(0.27)	0.52+	(0.27)	0.66*	(0.28)
Pakistani	0.14	(0.26)	0.13	(0.26)	0.20	(0.26)	0.25	(0.27)
Asian Other	0.01	(0.27)	0.00	(0.27)	0.00	(0.27)	0.13	(0.30)
African	0.46*	(0.21)	0.45*	(0.21)	0.46*	(0.21)	0.33	(0.22)
Caribbean	0.42	(0.28)	0.42	(0.28)	0.42	(0.28)	0.45	(0.29)
Other	0.39	(0.27)	0.39	(0.27)	0.35	(0.27)	0.30	(0.30)
Cognitive ability (std.)	1.36***	(0.06)	1.36***	(0.06)	1.35***	(0.06)	1.35***	(0.06)
Duration of residence in the UK	0.26***	(0.02)	0.26***	(0.02)	0.26***	(0.02)	0.26***	(0.02)
Has an additional language (L1)	-0.14	(0.17)	-0.14	(0.17)	-0.15	(0.17)	-0.17	(0.17)
Avg. duration of residence of cohort (std.) (A)	0.31**	(0.10)	0.32**	(0.11)	0.22*	(0.10)	0.29*	(0.12)
Prop. students with an L1 in cohort (std.)			0.08	(0.18)	-0.04	(0.16)	-0.03	(0.16)
Prop. Students with a degree-educated parent (std.) (B)					0.57***	(0.10)	0.57***	(0.11)

	Model 5		Model 6		Model 7		Model 8	
	B	**s.e.**	**B**	**s.e.**	**B**	**s.e.**	**B**	**s.e.**
Interactions - ethnic group X contextual effect								
White Other x (A)							0.57**	(0.19)
Indian x (A)							0.05	(0.28)
Pakistani x (A)							0.26	(0.21)
Asian Other x (A)							0.08	(0.20)
African x (A)							-0.09	(0.15)
Caribbean x (A)							0.24	(0.25)
Other x (A)							0.32+	(0.18)
White Other x (B)							0.83***	(0.24)
Indian x (B)							0.28	(0.25)
Pakistani x (B)							0.57*	(0.24)
Asian Other x (B)							0.08	(0.25)
African x (B)							0.55*	(0.22)
Caribbean x (B)							0.69*	(0.34)
Other x (B)							0.82***	(0.24)
Constant	13.22***	(0.62)	13.30***	(0.65)	13.62***	(0.64)	13.62***	(0.65)
Level 2 variance	0.57**	(0.12)	0.57**	(0.12)	0.38***	(0.09)	0.39***	(0.09)
BIC	18792		18800		18778		18871	

*Notes: + p< 0.10, *p < 0.05, ** p <0.01, *** p < 0.001. There are 3730 students from 107 schools in all models.*

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