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Abstract

One of the most significant developments within English education over the last decade has been the expansion of specialist schools as a means by which to promote diversity and drive improvement. While much research has examined the impact of specialist schools on outcomes such as attainment, little attention has been paid to the schools' demographic compositions or their potential for exacerbating segregation. Gorard and Taylor (2001) reported that specialist schools admitted proportionally fewer children from deprived backgrounds over time. Building on their work, this paper uses data from the Pupil Level Annual School Census and the Index of Multiple Deprivation to examine changing intakes of specialist and non-specialist schools between 2001/2 and 2004/5. Trends in segregation were not significantly associated with the presence or otherwise of specialist status in a school. However, they were significantly associated with Foundation status and the presence of strong and/ or improving examination results. Such schools drew more 'privileged' intakes over time.

Introduction[1]

In 1993, the Conservatives introduced a programme in England that would promote 'diversity' within state secondaries by allowing schools to specialise in particular subject areas. It was felt this would enhance parental choice while driving improvement by creating competition between institutions. The initiative grew out of earlier 'City Technology Colleges' (CTCs), introduced in 1986 to promote an increased focus on vocational curricula and the global liberalisation of educational supply at a time of New Right fervour regarding

[1] With thanks to the ESRC for award PTA-030-2003-01401.

'quasi-markets'; hence semi-autonomous schools were created with devolved responsibility for funding and admissions.

Under Labour, schools in England are permitted to become specialist on the basis of two central criteria: a) consistently high examination scores or at least an upward trajectory in examination results; b) £50,000 raised in private sponsorship. Specialist schools receive £100,000, then an extra £129 per pupil, per annum over four years. They are permitted to select 10 per cent of pupils by 'aptitude', though the distinction between this and general academic ability has been questioned (West and Hind, 2003). While in 1997/8 only 7 per cent of English secondaries were specialist, in 2006/7 eight in ten secondaries specialised. Figure 1 shows the upward trajectory of specialist schools as a proportion of all English schools between 1994/5 and 2006/7.

FIGURE 1 ABOUT HERE

Research on the 'impact' of specialist schools

Within the last decade, research has been carried out on specialist schools' ability to boost school improvement. Unadjusted examination scores have been identified as higher in specialist schools, while the SSAT-funded series *Educational Outcomes and Value Added by Specialist Schools* (Jesson and Crossley, 2006) which compares results in terms of 'value added' has also reported specialist schools to be outperforming non-specialist counterparts.

However, no mention is made of the impact additional funding has on examination results, or indeed the possibility that 'Hawthorne effects' may only be temporary. Some

research (Schagen et al, 2002; Schagen and Schagen, 2002; 2003; 2005; Levačić and Jenkins, 2004; Noden and Schagen, 2002; 2006) has used multilevel modelling to quantify the isolated impact that specialist status has on school examination performance. A positive impact has been confirmed, but this impact is markedly more modest than has been suggested in *Educational Outcomes*. Attention has been drawn to the difficulties of modelling resource effects in specialist schools and also to 'reverse causality', namely the problem in policy evaluation that specialist schools are a non-random, self-selecting group.

Since the mass expansion of specialist schools began in 1997/8, arguments have been made that, despite improving examination scores within specialist schools, there is a danger this is simply a function of the changing composition of specialist schools which draw more privileged intakes over time. It is not the purpose of this paper to model examination performance in light of changing school compositions. However, the paper does examine changing compositions as an *intrinsically important* programme impact. Such an impact – perhaps resulting from heightened popularity of specialist schools combined with the permission to select students by aptitude – could have implications for the exacerbation of a 'two-tier' education system and indeed wider social division as a result.

Previous research (Exley, 2007) has explored the differing profiles of schools that became specialist in 2001/2 and in 2004/5 and has found that, throughout this period of mass specialist school expansion, growth took the form of an 'academic procession' (Riesman, 1956) where schools in the most favourable circumstances led the race for specialist status and schools in the least favourable circumstances remained 'residualised' as non-specialist. A recent slowing of growth in specialist school numbers plus the fact schools in unfavourable

circumstances are those failing to gain specialist status[2] should in itself give cause for government concern. If there is evidence to suggest non-specialist schools have drawn *increasingly disadvantaged* intakes, this could have implications for both segregation of pupils between school types and the exacerbation of non-specialist schools' residualisation. Such potential exacerbation is referred to in this paper as a **'drawbridge effect'** because it could mean certain schools will find it increasingly difficult to gain specialist status.

Journalistic references to the potential exacerbation of a 'two-tier' education system (e.g. Cassidy, 2001; Slater, 2001; Abrams, 2001) arising from specialist schools post-1997 have so far been lacking in evidence. However, Gorard and Taylor (2001) examined specialist schools using data from the Annual School Census (ASC) and found that these schools did admit proportionately fewer children from disadvantaged backgrounds (as measured by Free School Meal – FSM – eligibility) between 1994/5 and 1999/00, providing some evidence of a 'drawbridge effect'. This pattern was found to be particularly the case where specialist schools were also their own admissions authorities, for example in the case of foundation, voluntary-aided or grammar schools. The authors argued that 'the fact that many specialist schools are sited in inner city disadvantaged areas does not, in itself, mean that they serve a representative section of the local community'. They expressed concern over expansion of the specialist schools programme. Four years, and the creation of over 1,500 specialist schools later, Taylor et al (2005) reiterated these concerns, albeit without new data. Thus, a knowledge gap regarding specialist schools after 2001 was identified and the stage was set for further research into the social composition of intakes by school type.

[2] For example, schools in special measures are *not permitted* to become specialist. Such schools have on average 20 per cent of pupils eligible for FSM, compared with 14 per cent nationally.

Research questions

This paper builds on existing research on the characteristics of specialist and non-specialist schools. It examines changing compositions in the period after 2001 but also makes a methodological contribution by using data from the Pupil Level Annual School Census to isolate the characteristics of annual *Year 7* intakes for different school types. New measures of socio-economic positioning have been created by linking pupil postcodes to the Index of Multiple Deprivation (IMD). 'Segregation ratios' have been calculated to facilitate examination of pupils from the most *and least* disadvantaged home postcodes. Questions addressed in the paper are as follows:

1. Did **specialist schools** draw a **more privileged** intake, comprising greater proportions of pupils from the **least disadvantaged backgrounds** and fewer from the **most disadvantaged backgrounds**, between 2001/2 and 2004/5?
2. Did **non-specialist schools** draw a **less privileged** intake, comprising smaller proportions from the **least disadvantaged backgrounds** and greater proportions from the **most disadvantaged backgrounds**, between 2001/2 and 2004/5?
3. Were potential changes in intakes between 2001/2-2004/5 affected by **other school-level characteristics** beyond specialist/ non-specialist status?

These questions comprise a test for a 'drawbridge effect' in English secondaries between 2001/2 and 2004/5. Such an effect would mean specialist schools had drawn increasingly

privileged Year 7 intakes and conversely non-specialist schools had drawn decreasingly privileged Year 7 intakes, perhaps making it more difficult for the latter to become specialist.

The paper is divided is divided into two parts. The first involves descriptive analyses of pupil segregation and the second involves multivariate analyses in order to ascertain whether segregation patterns can be attributed to specialist or non-specialist status *per se*. The paper begins by outlining data and methods used. Next, change in simple distributions of Year 7 pupils from different 'disadvantage deciles' attending specialist and non-specialist schools over time is examined. Following on from this, the concept of 'segregation' relative to school compositions is introduced and with it the 'segregation ratio' (SR) as a means for measuring segregation between schools. SR figures for specialist and non-specialist schools are presented longitudinally at the national level, separating out 'membership effects' in order to isolate any 'real' change in ratios over time. Multivariate analysis is carried out in order to show which school characteristics are those predicting SR change. In particular, OLS regression is used to model the potential effects of specialist/ non-specialist status on SR between 2001/2 and 2004/5.

Data and methods

The Pupil Level Annual School Census (PLASC)

Development of the first PLASC in 2001/2 marked a turning point for research into the social compositions of schools. Initially piloted in 1999/00, PLASC comprises an annual list of all pupils in all English schools with data on year group, gender, date of birth, mother tongue,

ethnic group, special educational needs and Free School Meal (FSM) eligibility. PLASC also includes a measure for the Census 'Output Area' into which a pupil's home postcode falls.

Before 2001/2, comprehensive data on individual pupils did not exist nationally. National examinations of phenomena such as segregation of pupils from different socio-economic groups between schools largely relied on school-level proportions eligible for FSM. It was not possible to break figures down by year group and so Year 7 intakes could not be examined in isolation. In 2001/2 Philip Noden argued:

> 'In the context of the debate on the effects of the quasi-market it would of course be more informative to examine only the Year 7 cohort, that is, changes in the new intake of pupils at secondary schools' (Noden, 2002: 200).

Analysis of school compositions in this paper uses the first four years of PLASC, examining only Year 7 intakes. While the relatively short time period here might be considered a limitation, it is hoped this limitation is offset by the use of a method which is more likely than a study of entire school compositions to pick up subtle year-on-year change.

Mapping PLASC onto the IMD

Inclusion of the Census 'Output Area' (OA) into which a pupil's home address falls forms a key advantage to using PLASC in examining the social composition of school intakes. OA information can be linked to the 2004 Index of Multiple Deprivation (IMD) to provide a measure of disadvantage for each Year 7 pupil's neighbourhood. The IMD comprises a composite measure of seven deprivation 'domains' – income; employment; health and

disability; education, skills and training; barriers to housing and services; living environment; and crime (Noble et al, 2004). Neighbourhood 'ranks' for the country are produced, so for each PLASC pupil there exists a national rank order (where 1 = most disadvantaged) for the area in which s/he lives.

While existing research on the distribution of different pupils attending different schools has focused on FSM eligibility, this only allows distributions of the most disadvantaged pupils to be examined. A method linking pupil neighbourhood to the IMD allows distribution of pupils experiencing various levels of disadvantage (as inferred from home postcode) to be explored. Significantly, distributions of pupils living in the least disadvantaged neighbourhoods can be examined. More generally, there is a case in studying pupil segregation for extending focus from FSM as a (limited – see Hobbs and Vignoles, 2007) measure of financial disadvantage to conceptualisations of disadvantage based on wider 'social exclusion'. Academics have long debated the relative merits of a reconfiguration of 'poverty' in this multi-dimensional direction as exemplified in the 1997 Government establishment of the Social Exclusion Unit (*see* Room, 1999; Hills et al, 2002).

Analysis Caveats

It is not the purpose of this paper to model causal processes by which schools might draw more 'privileged' intakes. Data deployed are not detailed enough at the school level to test for such processes. There is, for example, no data on individual school admissions criteria. Analysis merely seeks to highlight trends in specialist and non-specialist intakes and multivariate analysis seeks to identify some school-level characteristics associated with these

trends. Explanations posited for change over time should be considered tentative, although evidence presented does point to the need for future research exploring the processes beyond school-level characteristics that give rise to changing school compositions.

It is also important to remember that what is under-examination is not the 'starting points' of schools in terms of disadvantaged intake at fixed time points. These will vary for numerous reasons, not least the impact of residential segregation given the chosen measure of 'proportions from disadvantaged postcodes'. This paper is concerned with *trends* in Year 7 intakes for specialist/ non-specialist schools. A school may have admitted low proportions from disadvantaged postcodes for the last ten years. Indeed, it may be that there are few disadvantaged postcodes nearby from which it could reasonably draw pupils. It is change in intake with respect to specialist/ non-specialist status and the exacerbation of existing disadvantage that this paper seeks to address.

Descriptive explorations of segregation

Considering the Intake of Different School Types: An Initial Look at Proportions

Table 1 shows the composition of specialist and non-specialist schools in 2001/2, 2002/3, 2003/4 and 2004/5. 'Composition' here denotes basic proportions of pupils for each school type who fall into each of the ten 'deciles of disadvantage' as calculated using IMD rankings for Year 7 pupil neighbourhoods. A value of 1 within this scale indicates pupils whose postcodes fall into the ten per cent of neighbourhoods with the highest levels of disadvantage

in England. A value of 10 indicates pupils whose postcodes fall into those ten per cent of neighbourhoods with the lowest levels of disadvantage.

TABLE 1 ABOUT HERE

From the table, it can be seen that in 2001/2 the distribution of Year 7 pupils falling into different deciles of disadvantage was skewed towards the more disadvantaged deciles for both specialist and non-specialist schools (essentially a function of densely populated poorer areas plus the fact this data does not include private schools). However, this skew was more marked for non-specialist schools which had greater proportions of their Year 7 intake than specialist schools falling into the most disadvantaged deciles and smaller proportions than specialist schools falling into the least disadvantaged deciles. A similar pattern can be seen for specialist schools in 2002/3, but the distribution for non-specialist schools has become further skewed towards pupils from the disadvantaged deciles. Fourteen per cent of non-specialist schools' intake in 2002/3 was made up of those from the most disadvantaged decile compared with just 8.5 per cent from the least disadvantaged decile. The figures for specialist schools in this year were 11.9 and 11.3 per cent, respectively. By 2003/4 patterns for specialist schools still remained stable but for non-specialist schools 15 per cent of their Year 7 intake were now in the most disadvantaged decile compared with just 7.9 per cent in the least disadvantaged decile. Finally, this pattern was exacerbated even further in 2004/5 with stable figures for specialist schools but 17.1 per cent of non-specialist school pupils falling into the most disadvantaged decile and only 6.3 per cent in the least disadvantaged decile.

Overall, Table 1 shows relatively stable proportions attending different school types among middling deciles of disadvantage between 2001/2 and 2004/5. However, the proportion of specialist schools' Year 7 intake that is made up of those from the most disadvantaged decile of neighbourhoods became marginally smaller over time. Conversely, the proportion of non-specialist schools' Year 7 intake made from the same group became larger over time. The proportion of specialist schools made up of those from the least disadvantaged decile of neighbourhoods has remained stable, whereas this group constituted a shrinking proportion of non-specialist schools' Year 7 intake between 2001/2 and 2004/5.

Thus, patterns of distribution between the deciles for specialist and non-specialist schools are divergent over time. In 2001/2 the sum of differences in proportions between the school types was just 7 per cent, whereas in 2004/5 it was 26 per cent. Such changes over time could relate to the combined effects of parental choice and school admissions or they could relate to the types of schools which were specialist/ non-specialist in each year. These ideas are discussed further below.

Using the Segregation Ratio (SR) to Examine School Compositions

Building on basic considerations of pupils in different disadvantage deciles attending specialist/ non-specialist schools, we now focus specifically on pupil segregation between schools, which has received much academic attention in recent years. In 1988, Massey and Denton described five conceptually distinct 'dimensions' of segregation – 'evenness', 'exposure', 'concentration', 'centralisation' and 'clustering'. 'Evenness' between schools has been defined by Croxford and Paterson (2006) as 'whether a group is over-represented in

some schools, and under-represented in others' (p. 384) and this paper focuses on Year 7 segregation between specialist and non-specialist schools in terms of evenness.

Multiplicative approaches to educational segregation have traditionally taken the form of standard indices based on dichotomous categorical variables. Within the recent 'Index Wars'[3] it might be argued that the Segregation Ratio (SR), utilised by Gorard and Fitz (2000a) and Gorard and Taylor (2001), has been unfairly overlooked as an 'evenness' segregation measure. Noden (2000) pointed out that area summary level segregation measures simply indicate the proportion of pupils within a defined locality that would have to move schools in order to ensure an even spread of a certain characteristic. They do not indicate *from which schools pupils would have to move*.

By contrast, this is exactly the issue addressed by SR – a simple probability ratio giving a measure for each school and indicating whether or not the school is taking more or less than its 'fair share' of particular types of pupils within a defined locality: in this paper the local LEA. SR is a comparison of proportions of pupils with a certain characteristic in a school with area-level proportions for the same characteristic. *A value of greater than 1 indicates a school is taking more than its fair share; a value of less than one indicates it is taking less than its fair share*. This ratio is standardised so differences in overall levels of poverty both over time and between localities are accommodated, enabling trajectories of segregation for individual schools and also aggregated school types to be traced. Calculations of SR in this paper are based on two central characteristics, each 'binary' in nature: 1) Year 7 pupils living/ not living in the 20 per cent most disadvantaged postcodes in England; 2) Year 7

[3] This refers to debates over area summary level segregation measures such as the Dissimilarity Index; also to debates over the modelling of segregation. See Gorard and Fitz (2000a); Goldstein and Noden (2003); Croxford and Paterson (2006); Allen and Vignoles (2007); Jenkins et al (2008).

pupils living/ not living in the 20 per cent most 'advantaged'[4] postcodes in England.[5] The formulae are as follows:

$$\frac{\textit{Disadvantaged postcode Yr 7 pupils in school / Disadvantaged postcode Yr 7 pupils in LEA}}{\textit{Total Yr 7 pupils in school / Total Yr 7 pupils in LEA}}$$

and

$$\frac{\textit{'Advantaged' postcode Yr 7 pupils in school / 'advantaged' postcode Yr 7 pupils in LEA}}{\textit{Total Yr 7 pupils in school / Total Yr 7 pupils in LEA}}$$

Segregation Ratio Trends

Tables 2 and 3 show nationally aggregated means of SRs for specialist and non-specialist schools[6] over time with respect to schools taking their 'fair share' of Year 7 pupils from the most disadvantaged (Table 2) and most 'advantaged' (Table 3) neighbourhoods. Looking at the **first row** in **Table 2**, it can be observed that specialist schools consistently admitted fewer than their 'fair share' of Year 7 pupils from disadvantaged postcodes and that there was little change in this pattern (+0.007) over time. By contrast, looking at the **third row** within **Table 2**, non-specialist schools in 2001/2 admitted more than their fair share of pupils

[4] The IMD is essentially an index measuring disadvantage; it does not include specific indicators of wealth and advantage. Thus, what is measured in this paper is not disadvantage and advantage per se; rather disadvantage and an *absence of disadvantage*. The word 'advantage' is therefore kept in inverted commas throughout.

[5] For calculating SR, binary characteristics for pupils were required. This meant switching from considering deciles of disadvantage to categorising pupils as either disadvantaged or not disadvantaged/ 'advantaged' or not 'advantaged'. The 'bottom 20 per cent' and 'top 20 per cent' cut off points were chosen because selecting only the bottom and top 10 per cent would have yielded too many missing SR values (i.e. where no pupil in a school or LEA lived in one of these neighbourhoods).

[6] Numbers in brackets in all tables indicate standard errors around SRs.

from disadvantaged postcodes and this pattern became more marked between the baseline year and 2004/5. This provides some indication of divergence in the profile of specialist and non-specialist schools.

TABLES 2 and 3 ABOUT HERE

Table 3 which looks at distribution of Year 7 pupils from the most 'advantaged' postcodes tells a different story. Looking at the **first row**, it can be seen that in 2001/2 specialist schools admitted more than their fair share of these pupils. In 2004/5 specialist schools still admitted more than their fair share of pupils from 'advantaged' postcodes but the figure was lower. This suggests specialist intakes became more reflective of local populations between 2001/2 and 2004/5, although it should be stressed change was not significant.[7] Perhaps more interesting is what happened to the presence of pupils from 'advantaged' home postcodes in *non-specialist schools* between 2001/2 and 2004/5. Looking at the **third row** in **Table 3**, in 2001/2 these schools drew fewer than their fair share of pupils from 'advantaged' postcodes (0.919) but this was exacerbated over time and in 2004/5 the same figure was 0.717 – a change of -0.202 in three years and a departure from the trend for all secondaries, not to mention divergence from the trend for specialist schools.

While specialist schools did not draw fewer pupils from disadvantaged neighbourhoods over time relative to 'fair shares', nor indeed did they draw greater proportions of pupils from

[7] Data in this paper comprised all Year 7 pupils within all 'standard' English secondary schools. Gorard and Fitz (2000a) argue that statistical significance does not apply where data comprises a population census. However, Croxford and Paterson (2006) argue the need to view even census data as a sample of some larger 'hyper-population' and thus analysis controls for 'worlds that might have been'. Difference of means tests were utilised in descriptive analysis in order to identify p-values for longitudinal change. Significance at the $p \leq 0.05$ and $p \leq 0.01$ levels are reported in multivariate analysis (Tables 6 and 7).

these neighbourhoods. Specialist schools did slightly reduce the margin by which they were taking more than their fair share of Year 7 pupils from 'advantaged' neighbourhoods, but in 2004/5 they still drew markedly more than their fair share of these pupils. Meanwhile, there is a small amount of evidence for a 'drawbridge effect' in that non-specialist schools have drawn less privileged intakes over time. However, there exists an important caveat to these findings: namely the changing profiles of specialist and non-specialist schools as two distinct groups, particularly with respect to expanding numbers of specialist schools.

In terms of 'fair shares' of pupils from particular neighbourhoods, expansion in the overall proportion of English secondaries which are specialist between 2001/2 and 2004/5 will automatically have led specialist schools *as a group* towards less privileged Year 7 intakes. This is because local populations will naturally reflect the intake of whichever school type (specialist or non-specialist) is in the majority. SR change which can be attributed to simple changing membership of the specialist group of schools is referred to here as **'membership effects'**.

In examining changing specialist and non-specialist school Year 7 intakes, it is important to consider changing 'membership' between the two groups over the period 2001/2-2004/5. One way of controlling for changing membership over time is to isolate only those schools which remained either specialist or non-specialist throughout, without switching status. While the first and third rows in Tables 2 and 3 show changing SRs for the entire (growing) body of specialist schools/ the entire (shrinking) body of non-specialist schools in each year, the **second rows** show corresponding figures only for those schools that had been specialist back in 2001/2 *and remained that way throughout*. The **fourth rows** show SR figures only for those schools which were non-specialist in 2001/2 *and still non-specialist in 2004/5*.

Tables 2 and 3 show clearly that much change over time in Year 7 intakes can be accounted for by 'membership effects' in specialist and non-specialist groups. Once these are controlled for, change is not significant at the $p<0.05$ level and simple trendless fluctuation is observed. With respect to non-specialist schools, those that remained non-specialist throughout 2001/2 – 2004/5 did take an increasing amount of their 'fair share' from disadvantaged neighbourhoods, but this was only +0.028 rather than +0.225 for all non-specialist schools over the period. Similarly, non-specialist schools did take even fewer pupils from 'advantaged' neighbourhoods over this period, but the decline was just -0.039 compared with -0.202. Findings to support the notion of a 'drawbridge effect' here are weak.

For specialist schools, what initially looked to be a pattern of these moving slightly towards their fair share of Year 7 pupils from 'advantaged' neighbourhoods now appears to have been a 'membership effect'. Schools which were specialist throughout 2001/2 – 2004/5 did draw a less 'advantaged' intake over this time period but change was marginal, and the distribution of disadvantaged intake for specialist schools is confirmed as being stable. It should be noted here, however, that an absence of change also negates the notion that specialist schools have drawn intakes *more reflective* of local 'fair shares' over time as expected given rising specialist school numbers.

Table 4 reports SR trends for schools that became specialist in individual years between 2001/2 and 2004/5 in order to untangle patterns for specialist schools excluded from analysis in Tables 2 and 3. Baseline figures are presented in bold (for all years except 2001/2 where the data did not permit a baseline) in order to indicate aggregate mean SRs *the year before* schools became specialist. Again trendless fluctuation is observed, with no significant trend for schools that became specialist in any year.

TABLE 4 ABOUT HERE

Figures presented from this point onwards refer only to schools that did not 'switch status' between 2001/2 and 2004/5.

Modelling change in segregation ratios over time

In the SR analysis by specialist/ non-specialist school type above, it has been demonstrated that trends in ratios may be little more than a function of 'membership effects', i.e. the rising number of specialist schools between 2001/2 and 2004/5, because local populations will naturally reflect the intake of whichever type of school is in the majority.

However, previous descriptive analysis (Exley, 2007) has shown there is an interesting story to be told *within* specialist schools, because certain specialist school types have become more reflective of local populations in their intakes whereas others have not. Indeed, contrary to the trend of expanding specialist school numbers, some specialist school types have become *less reflective* of local populations. What were the characteristics of these specialist schools? Table 5 outlines key subgroup characteristics of specialist and non-specialist schools by which SR trends were examined.

TABLE 5 ABOUT HERE

Overall, descriptive subgroup analysis of SR trends between 2001/2 and 2004/5 confirmed a picture of trendless fluctuation for both the disadvantaged and 'advantaged' SRs.[8] However, there did exist some tentative patterns. Secondary modern schools drew fewer pupils from disadvantaged neighbourhoods over time, while faith schools in their various forms showed divergence in intakes over time *between those with specialist and non-specialist status*. Within language colleges there was an increase in 'advantaged' intake relative to fair shares, whereas within non-specialist schools which were under-subscribed or had high expenditure, high proportions on FSM or poor GCSE performance, there were decreasing 'advantaged' intakes. Taken together, this amounts to some small evidence of a 'drawbridge effect' between specialist and non-specialist schools.

Still, it remains to be seen whether SR change can be attributed to the effect of having gained specialist status *per se*, or indeed whether change is simply an artefact of other school characteristics that might affect intakes. Here OLS regression models are used in order to untangle the effects of various independent variables on two dependent variables – changing disadvantaged and 'advantaged' SRs between 2001/2 and 2004/5. During this period, certain schools became more 'exclusive' with respect to the two ratios, others became less so. What factors predict positive or negative change? Does specialist status emerge as a key factor? If so, is this effect significant?

Tables 6 and 7 show linear regression models which predict change in 'disadvantaged' and 'advantaged' SRs respectively between 2001/2 and 2004/5.[9] Independent variables mirror those in Table 5, save for two added sets of variables:

[8] Here the terms 'disadvantaged SR' and ''advantaged' SR' describe the two dependent variables calculated for each school according to specified formulae earlier in the paper (see Tables 2 and 3 respectively).
[9] Regressions were carried out on change in *logged* SRs because this provided more normal value distributions.

1. Specialist/ non-specialist status: only schools that were specialist/ non-specialist throughout the whole time period counted as '1' for these dummy variables (i.e. 1,150 'switchers' counted as zero for both). Thus the variables are not mutually exclusive and both can be included in a single regression
2. SR figures as they stood in 2001/2: useful for predicting trajectories of SR change.

Positive coefficients in the tables denote a relationship between schools' possession of a characteristic and **SR increase** – i.e. taking proportionately more of a 'fair share' of Year 7 pupils from disadvantaged (Table 6) or 'advantaged' (Table 7) backgrounds over time. Negative coefficients denote a relationship between possession of a characteristic and **SR decrease** – i.e. taking less of a 'fair share' of certain pupils over time. Within Tables 6 and 7 only those coefficients which emerged as statistically significant at the 0.05 or 0.01 level are reported. However, specialist and non-specialist status are reported whether significant or not because they are central to the concerns of the paper.

TABLE 6 ABOUT HERE

From Table 6 it can be seen that change in the disadvantaged SR is strongly predicted by a school's SR position in 2001/2. Schools admitting fewer Year 7 pupils from disadvantaged neighbourhoods in 2001/2 admitted greater proportions relative to fair shares over time, whereas schools admitting greater proportions of these pupils in 2001/2 admitted smaller proportions over time. More notably, however, it can be seen that higher baseline examination results and school improvement were associated with drawing decreasing

proportions of disadvantaged intake. Improvement in results simultaneous to decreasing proportions of disadvantaged intake might be expected here given 2002 neighbourhood Key Stage 2, 3 and 4 examination scores are among the deprivation measures included in the 2004 IMD. Still, decreasing disadvantaged intakes in schools which already had strong examination scores is something that ought to alert government concern. Rural schools and foundation schools (the latter here have greater autonomy over admissions than do schools such as community schools) both drew significantly decreasing proportions of disadvantaged Year 7 pupils relative to fair shares between 2001/2 and 2004/5.

Nevertheless, importantly for this paper, neither specialist nor non-specialist status appeared to make a difference in predicting disadvantaged SR change over time. While some school types as outlined above could certainly be confirmed as drawing smaller proportions of Year 7 pupils living in disadvantaged neighbourhoods relative to fair shares over time, this was not a characteristic associated with schools possessing specialist status *per se*. There is no evidence in Table 6 for a 'drawbridge effect' whereby non-specialist schools draw increasingly disadvantaged intakes rendering it even more difficult for them to gain the 'additionality' associated with specialist status.

Considering the 'advantaged' SR between 2001/2 and 2004/5, Table 7 shows that a moderate amount of variance is explained by the 'starting point' ratio in 2001/2 (a coefficient of -0.422) meaning that schools which previously admitted a lower proportion of Year 7 pupils from 'advantaged' neighbourhoods relative to their fair share, tended to admit greater proportions in 2004/5. Conversely, those schools that admitted a greater proportion of pupils from 'advantaged' neighbourhoods in 2001/2 admitted fewer of these in 2004/5. However, there were also significant negative effects for grammar schools and girls' schools.

Secondary modern schools drew more 'advantaged' intakes relative to fair shares over time, although the extent to which this represents schools becoming less reflective of local populations depends on schools' starting points. Denominational or 'faith' schools drew less 'advantaged' intakes over time. This was in strong contrast with schools which had strong baseline examination performance in 2001/2 which again were shown to draw more 'advantaged' intakes over time. Quite unsurprisingly, and of notable concern given government rhetoric on school improvement in England, those schools which improved most in terms of GCSE performance between 2001/2 and 2004/5 were also those which drew increasing proportions of pupils from 'advantaged' neighbourhoods (i.e. those where local examination performance – among other things – is strong) relative to their local fair shares of these pupils.

TABLE 7 ABOUT HERE

Again, it is important here to note the lack of a significant impact of specialist or non-specialist status on change in the 'advantaged' SR. Schools which became specialist between 1997 and 1999 were weakly positively associated with an increase, but this change was significant only at the $p<0.09$ level. Such a lack of evidence for the power of specialist status as a predictor of SR change ties in with Table 6 findings predicting trends in 'disadvantaged' SRs where again no evidence was found for specialist schools drawing more privileged intakes over time nor indeed non-specialist schools drawing less privileged intakes. On the distribution of Year 7 pupils living in 'advantaged' neighbourhoods, then, it can be

concluded that, while some school types have drawn marginally more privileged intakes and others marginally less privileged intakes, this has not been a result of specialist status.

Conclusions

Government evaluations of specialist schools in recent years have focused on examination performance, arguably at the expense of evaluations considering the schools' potential impact on segregation. So far, research on specialist schools and segregation has been scant. This is surprising given media and academic criticism since 1997 on the potential for the schools to exacerbate a 'two tier' system of education. It is also surprising because segregation of pupils with certain characteristics could have implications for school improvement and it could be considered an intrinsically negative policy by-product given its implications for community, social cohesion and inclusion.

This paper set out to examine the extent to which specialist schools were between 2001/2 and 2004/5 drawing more privileged Year 7 intakes and the extent to which non-specialist schools were drawing less privileged intakes, potentially rendering it more difficult for non-specialist schools to gain specialist status. Has such an effect occurred? Overall the answer has to be no. Early reports of increased tendencies towards more privileged intakes among specialist schools between 1994/5 and 1999/00 (Gorard and Taylor, 2001) were not confirmed in this paper for the period 2001/2 to 2004/5, although it should be stressed that different methods were adopted here. Controlling for 'membership effects' to take into account specialist school expansion, it was shown that specialist schools did not draw smaller proportions of pupils from disadvantaged neighbourhoods relative to fair shares over time,

nor did they draw greater proportions of pupils from 'advantaged' neighbourhoods. Similarly, non-specialist schools did not draw greater proportions from disadvantaged neighbourhoods and nor did they draw smaller proportions from 'advantaged' neighbourhoods.

Does this mean that early fears over the potential for specialist schools in England to exacerbate a 'two-tier' education system may now be considered overblown? While descriptive tables in this paper showed that segregation of pupils from disadvantaged and 'advantaged' neighbourhoods between specialist and non-specialist schools does exist, this is perhaps a function of wider social/ educational stratification, and the paper found no evidence that specialist/ non-specialist segregation is increasing over time. However, nor is such segregation decreasing, and it could be regressive in policy terms to grant positional advantage plus extra funding within a competitive educational marketplace to schools with privileged intakes while schools without such intakes struggle to gain such advantage. Consideration must be given by government to schools with disadvantaged intakes that do not yet have specialist status (Exley, 2007). These schools may not face a 'drawbridge' effect through *increasingly* disadvantaged intakes but, because of wider stratification, they still face difficulty achieving specialist status given their positional disadvantage.

In the long term, it might be that the specialist schools programme overall in England will prove less harmful than some critics have suggested but also less helpful than government advocates have suggested. However, now that the programme has expanded to an extent where specialist status is no longer 'special' and indeed *not* possessing specialist status might confer a negative badge of stigma, what are the segregation implications of new 'tiers' of funding and additionality within the programme, such as 'high performing', 'combined' or

'training' specialist status? What are the segregation implications of those specialist schools which make specific use of permission to select by aptitude (up to 10 per cent of specialist schools according to Coldron et al, 2001)? Moreover, what are the segregation implications of other initiatives within the Labour agenda for educational choice and diversity, such as academies, foundation schools, faith schools and trust schools? Perhaps new 'badges of additionality' will arise where schools have large proportions of pupils registered on government 'Gifted and Talented' programmes indicating the presence of children with parents rich in cultural and economic capital (Tomlinson, 2008; Campbell et al, 2007). We have already seen that certain schools – including those with strong and/ or improving examination results (therefore more likely to succeed in gaining future labels of positional advantage akin to specialist status) and those with foundation status – have drawn more privileged Year 7 intakes over time. Such findings may relate to emerging associations between possession of Foundation status in a school and 'exclusionary' admissions practices such as selection by aptitude/ ability (see West et al, 2004). It is unlikely that school possession of such labels as 'academy' or 'trust school' will expand to the hitherto unprecedented degree that specialist status did, so the potential for some to exacerbate 'two-tier' elements in English secondary education may well exist. Such policy-relevant questions will require careful monitoring in future work on pupil segregation. It is suggested the method for measuring segregation trends presented in this paper provides a useful tool for undertaking such a task.

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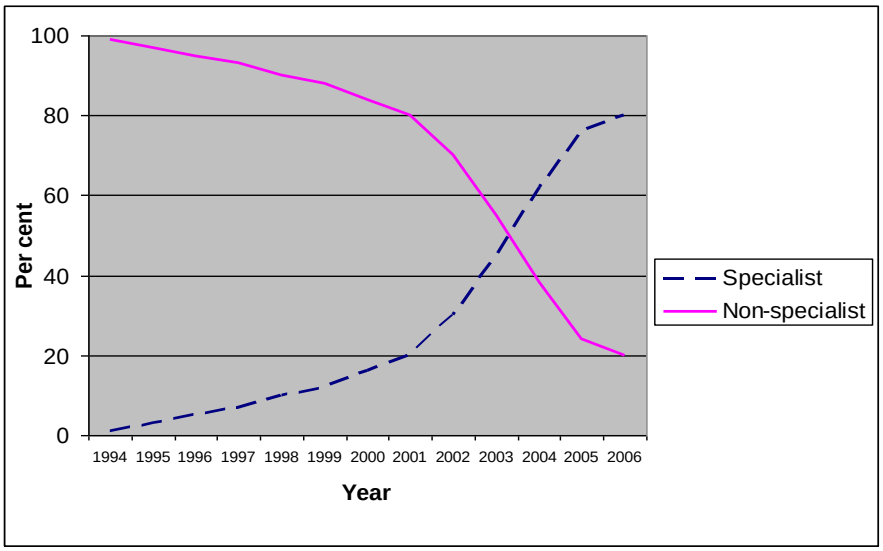
Exploring pupil segregation between specialist and non-specialist schools
TABLES AND FIGURES

Figure 1 – Proportions of specialist/ non-specialist schools in England, 1994/5 to 2006/7



Source: Specialist Schools and Academies Trust (SSAT)

Table 1 – Decile of disadvantage for Year 7 pupil home address by specialist status, 2001/2-2004/5

	Decile of disadvantage										
	1 most	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10 least**	**Total**
2001/2	*%*	*%*	*%*	*%*	*%*	*%*	*%*	*%*	*%*	*%*	*%*
Specialist	12.4	10.9	9.7	9.3	9.6	9.2	8.9	8.9	10.0	11.1	100.0
Non-specialist	13.5	11.8	10.5	9.9	9.3	9.1	9.0	8.9	8.9	9.0	100.0
All schools	13.2	11.6	10.3	9.8	9.4	9.1	9.0	8.9	9.1	9.5	100.0
Difference	-1.1	-0.9	-0.8	-0.6	+0.3	+.1	-0.1	0.0	+1.1	+2.1	*7*.1*
2002/3											
Specialist	11.9	10.4	9.5	9.4	9.5	9.2	9.3	9.3	10.1	11.3	100.0
Non-specialist	14.0	12.2	10.9	10.0	9.5	9.0	8.9	8.5	8.5	8.5	100.0
All schools	13.3	11.6	10.4	9.8	9.5	9.1	9.0	8.8	9.1	9.4	100.0
Difference	-2.1	-1.8	-1.4	-0.6	0.0	+0.2	+0.4	+0.8	+1.6	+2.8	11.7*
2003/4											
Specialist	10.8	10.2	9.7	9.4	9.6	9.3	9.7	9.6	10.5	11.2	100.0
Non-specialist	15.1	12.9	11.1	10.2	9.4	8.7	8.4	8.2	7.9	7.9	100.0
All schools	13.0	11.6	10.4	9.8	9.5	9.0	9.0	8.9	9.2	9.5	100.0
Difference	-4.3	-2.7	-1.4	-0.8	+0.2	+0.6	+1.3	+1.4	+2.6	+3.3	18.6*
2004/5											
Specialist	10.8	10.1	9.5	9.7	9.6	9.4	9.6	9.7	1.3	11.2	100.0
Non-specialist	17.1	14.1	12.0	10.0	9.3	8.7	8.0	7.4	7.0	6.3	100.0
All schools	13.0	11.5	1.3	9.8	9.5	9.2	9.1	8.9	9.2	9.5	100.0
Difference	-6.3	-4.0	-2.5	-0.3	+0.3	+0.7	+1.6	+2.3	+3.3	+4.9	26.2*

* Absolute difference

Source: PLASC (plus ASC/ IMD).

N for 2001/2 = 547,478; 2002/3 = 554,072; 2003/4 = 548,380; 2004/5 = 530,547.

Table 2 – Disadvantaged segregation ratios for specialist and non-specialist schools, 2001/2-2004/5

	Ratio 2001/2	Ratio 2002/3	Ratio 2003/4	Ratio 2004/5	Change 01/2-04/5
'Disadvantaged' SR					
All specialist schools	0.850 (0.055)	0.859 (0.044)	0.863 (0.033)	0.857 (0.029)	+0.007
Specialist through 01/2-04/5 only	0.850 (0.055)	0.834 (0.046)	0.844 (0.044)	0.863 (0.049)	+0.013
All non-specialist schools	1.096 (0.027)	1.120 (0.033)	1.207 (0.040)	1.321 (0.048)	+0.225
Non-specialist through 01/2-04/5 only	1.293 (0.048)	1.312 (0.049)	1.336 (0.051)	1.321 (0.048)	+0.028
N	*2921*	*2927*	*2925*	*2935*	

Source: PLASC (plus ASC/ IMD)

Table 3 – 'Advantaged' segregation ratios for specialist and non-specialist schools, 2001/2-2004/5

	Ratio 2001/2	Ratio 2002/3	Ratio 2003/4	Ratio 2004/5	Change 01/2-04/5
'Advantaged' SR					
All specialist schools	1.178 (0.064)	1.198 (0.056)	1.137 (0.042)	1.100 (0.034)	-0.078
Specialist through 01/2-04/5 only	1.178 (0.064)	1.269 (0.075)	1.211 (0.072)	1.159 (0.062)	-0.019
All non-specialist schools	0.919 (0.034)	0.866 (0.033)	0.814 (0.039)	0.717 (0.044)	-0.202
Non-specialist through 01/2-04/5 only	0.756 (0.053)	0.705 (0.044)	0.730 (0.047)	0.717 (0.044)	-0.039
N	*2873*	*2889*	*2880*	*2869*	

Source: PLASC (plus ASC/ IMD)

Table 4 – Summary of segregation ratios (disadvantaged and 'advantaged') for non-specialist to specialist 'switchers', 2001/2-2004/5

	Ratio 2001/2	Ratio 2002/3	Ratio 2003/4	Ratio 2004/5	Change Baseline -2004/5
'Disadvantaged' SR					
Became specialist 2001/2 (no baseline)	0.909 (0.090)	0.929 (0.090)	0.920 (0.087)	0.924 (0.092)	-
Became specialist 2002/3	**0.846 (0.088)**	0.912 (0.095)	0.886 (0.094)	0.852 (0.085)	+0.006
Became specialist 2003/4		**0.848 (0.052)**	0.875 (0.053)	0.853 (0.054)	+0.005
Became specialist 2004/5			**0.838 (0.054)**	0.855 (0.058)	+0.017
'Advantaged' SR					
Became specialist 2001/2 (no baseline)	1.051 (0.149)	0.968 (0.132)	0.980 (0.145)	0.967 (0.128)	-
Became specialist 2002/3	**1.062 (0.075)**	1.046 (0.071)	1.025 (0.070)	1.067 (0.072)	+0.005
Became specialist 2003/4		**1.134 (0.069)**	1.108 (0.066)	1.053 (0.056)	-0.081
Became specialist 2004/5			**1.037 (0.068)**	1.087 (0.080)	+0.050

Source: PLASC (plus ASC/ IMD)

Table 5 – SR analysis by school subgroup characteristics

Characteristic	Explanation of measure used
School specialism	Arts/ Language/ Sports/ Technology
Specialist school cohort	1994-6/ 1997-9/ 2000-1
School 'selectivity'	Comprehensive / grammar / secondary modern
School governance	Community/ foundation/ voluntary-aided/ voluntary controlled school
School religion	Denominational / non-denominational school
Gender profile	Boys' / girls' / co-educational school
School (dis)advantage level	Assessed by proportions of all pupils eligible for FSM within each school. Schools assigned to 'advantaged', 'middle' and 'disadvantaged' categories on the basis of being below, within or above one standard deviation either side of the LEA mean
Examination scores	Proportion of pupils gaining 5 or more GCSEs at A*-C; also the trajectory of change in this proportion between 2001/2 and 2004/5
Over/under-subscribed	Total pupils in school divided by net capacity figures in each year
Expenditure	Based on DfES-provided standard per capita expenditure for each school[10]
Region	Government Office Region
Rural/ urban	Countryside Agency binary definition for wards in England based on key predictors: population density; economically active populations; public transport; employment in agriculture/ forestry/ fishing; employment in primary production; and ethnicity

Table 6 – Multiple linear regression predicting change in the (logged) 'disadvantaged' segregation ratio, 2001/2 – 2004/5

	Standardised Beta Coefficients
Specialist school (throughout 01/2-4/5)	0.020
Non-specialist school (throughout 01/2-04/5)	0.028
Examination results in 2001/2	-0.110**
Change in examination results 02-05	-0.122**
Rural school	-0.088**
Foundation school	-0.050**
Ratio in 2001/2	-0.389**
R-square	*0.118*

* Denotes significance at the 0.05 level

** Denotes significance at the 0.01 level

Source: PLASC (plus ASC/ IMD). N for the model = 2,706

[10] Higher expenditure implies 'Additional Educational Need' (AEN) within a school as a result of compensatory elements for schools in disadvantaged circumstances within government funding formulae.

Table 7 – Multiple linear regression predicting change in the (logged) 'advantaged' segregation ratio, 2001/2 – 2004/5

	Standardised Beta Coefficients
Specialist school (throughout 01/2-4/5)	-0.023
Non-specialist school (throughout 01/2-4/5)	-0.012
% with 5+ GCSEs at A-C in 2002*	0.278**
% change in examination results 0205	0.383**
Grammar school	-0.049*
Secondary modern	0.068**
Denominational school	-0.048**
Girls' school	-0.053**
Ratio 2001/2	-0.422**
R-square	*0.136*

* Denotes significance at the 0.05 level

** Denotes significance at the 0.01 level

Source PLASC (plus ASC/ IMD). N for the model = 2,720