SCHOOL QUALITY, CHILD WELLBEING AND PARENTS' SATISFACTION

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Abstract

Researchers in economics of education usually assume that parents choose schools for their high academic performance, with some support from revealed preference evidence based on local house prices. However, anecdotal evidence and common sense suggest that school quality is not one-dimensional and that parents and children are concerned about other school factors related to pupil wellbeing. In this paper we consider whether parental notions of school quality are based on academic standards, and whether these notions are aligned with the wellbeing of the children. To do so, we use direct information on stated perceptions in the Longitudinal Survey of Young People in England (LSYPE) matched to UK administrative records on pupil achievements. Our results suggest that test score based measures of school quality tend to dominate parents' perceptions of educational excellence. However, school quality along this dimension is not strongly associated with pupil happiness and enjoyment of the learning environment.

Keywords: School Quality; Wellbeing, Happiness and Satisfaction; Subjective Measures.
JEL Classifications: I20, H75; Z0.

1. Introduction

People undoubtedly believe that schooling offers a highway to a brighter future, and abundant research evidence shows that more education is, indeed, closely linked to future success in the labour market (Heckman, 2000), better physical and mental health (Chevalier and Feinstein, 2006, Grossman 2005, Blanchflower and Oswald, 2004), and other 'positive' adult-life outcomes. However, choosing a school that will benefit a child is a complex and daunting task, and parents and children often put considerable effort into this process. But what is it that parents and children value in schools, and how do parents weigh the benefits of academic excellence alongside other aspects of their child's wellbeing when judging school quality?

Economists and other researchers have usually assumed (for reasons of simplicity or lack of alternatives) that schools are chosen on the basis of average test-score outcomes. This emphasis is tied in with the close attention paid to schools' academic performance in government and the media, the idea being that readily available standardized information about school performance facilitates choice and school accountability. However, the simplifying assumption that academic output in a narrow range of subjects provides a sufficient statistic for school 'quality' is clearly open to question. In fact, there may be wider learning objectives and aspects of social, emotional and physical development that are at least as important as achievement in 'high stakes' tests in determining future life chances. Moreover, whilst it is true that academic outcomes rank highly in survey responses on parents' reasons for choosing a school, these surveys also reveal that many other factors play an important role, particularly the child's wishes and potential wellbeing at school (e.g Coldron and Boulton 1991, 1996; and Flatley et al 2001)[1].

Recently, broader considerations of pupil wellbeing have begun to take hold in the policy debate in England through the 'Every Child Matters' (ECM) initiative, which seeks to address child happiness and

[1]For example, *The Observer* newspaper, June 11 2006 reports: "Margaret Morrissey, of the National Confederation of Parent Teacher Associations, said: 'I once carried out a poll (…) of 1,000 parents and asked them what were the most important things to them in terms of their children's schools. The first thing was to be happy, the second was to be safe.' She reached number seven before grades became a priority."

fulfilment more broadly. Issues of pupil wellbeing, health and safety at school also feature in the US policy debate, for example in the 'No Child Left Behind' agenda (The White House, 2008) and in the Democratic presidential candidates' manifestos (see Clinton, 2008; and Obama, 2008). In England, this agenda has driven important changes in educational services in order to support five key outcomes for children and young people identified by the ECM initiative, namely to "be healthy", to "stay safe", to "enjoy and achieve", to "make a positive contribution" and to "achieve economic wellbeing" (see DCSF, 2004). The question then arises as to whether these kinds of objectives can be met in the current school context, where policy makers and parents tend to evaluate schools' excellence solely on the basis of academic achievement and pupils' test scores. While most research suggests that parents value school performance and effectiveness, this same research is silent about whether this is mirrored in higher levels of pupil enjoyment of their learning environment.

With these issues in mind, in this paper we examine children's attitudes towards their school along three dimensions: general happiness, relationships with teachers and intellectual stimulation. In parallel, we consider parents' judgement of overall school quality, and their views on teachers' relationships with their child and the progress that their child is making at school. Our main goal is to consider two related research questions, that is: a) To what extent are attitudes and experiences, amongst pupils and their parents, linked to standard test-score based measures of academic performance? b) To what extent are parents' perceptions of school quality linked to their children's happiness and enjoyment of school?

To answer these questions we make use of a unique large-scale survey of England's secondary school pupils, i.e. the Longitudinal Survey of Young People in England (LSYPE), which contains a very rich set of attitudinal responses and pupil background characteristics, and which we have matched to administrative records on pupil attainments and school average test scores. Our results suggest that academic achievement, as measured by school-mean test scores, tends to dominate other school characteristics in terms of parental perceptions of educational excellence. However, school quality along these dimensions is not associated with higher pupil wellbeing and enjoyment of the learning environment. Moreover, pupils' and parents' views do not seem to follow similar patterns in terms of

their association with observable school characteristics more generally. In contrast, parents' and children's views of schools and teachers are strongly related to child and family characteristics that pre-date the time they entered the school, and follow similar patterns in this respect. To further substantiate our arguments, and for comparison with the existing 'hedonics' literature that measures revealed preferences for school 'quality' through housing prices, we also link self-reported measures of school enjoyment and satisfaction to house prices prevailing in school catchment areas, and study whether these measures are capitalized into house prices. Lastly, we look into the role that school choice plays in shaping parent and pupil expressions of satisfaction and wellbeing.

The remainder of this paper is organised as follows. Section 2 discusses some related literature while Section 3 describes our data and the information it contains on pupils' enjoyment of their school and parental satisfaction with it. Next, Section 4 presents our main findings. Finally, Section 5 concludes.

2. Some Related Literature

Researchers in education and the sociology of education have often used survey responses (usually from fairly small surveys) to elicit parental preferences for schools, but analysis of directly observable or stated ratings for school 'quality' remains a relatively unexplored field in economics. In fact, most research in this field has addressed this question using a revealed preference approach and has looked for evidence of preferences for school 'quality' revealed through the capitalisation of school characteristics into local housing prices – i.e. the 'hedonic' valuation method. A fairly extensive international literature has considered whether house prices respond to schools' academic performance, usually measured in terms of average pupil test scores and a survey of recent examples of the hedonic approach is given by Gibbons and Machin (2007), who report a consensus estimate of around 3-4% house price premium for one standard deviation increase in average test scores. Bayer et al. (2007) offer a structural modification based on discrete housing choices that provides a correction to the hedonic framework when preferences are heterogeneous, to come to similar conclusions. However, with only few exceptions (e.g. Clapp et al. 2007, and Brasington and Haurin, 2006), the bulk of this research has focused on the effects of school

average test-scores, thus partly by-passing the questions set out at the beginning of this research, namely what is school 'quality', what aspects of school 'quality' do parents value, and does school 'quality' simply boil down to average test-scores?

Modelling discrete housing choices (residential location) offers an alternative to the hedonic framework discussed here above (Barrow, 2002). However, analysis of discrete schooling and teacher choices offers a more direct alternative to describe parental preferences for school attributes, and has been taken up by two recent papers. Hastings et al. (2005) use parental ranking of preferences for schools expressed in the US Mecklenburg County choice program to document that parents value schools that are close to home and schools with high average value test-scores, and that this second link is more pronounced for students with better-off family backgrounds (higher previous test scores and income). In a similar vein, Jacobs and Lefgren (2007) use parental requests for specific teachers to show that parents strongly prefer primary school teachers that are good at promoting student satisfaction, while they place relatively less value on a teacher's ability to raise standardized tests-scores. Finally, another way of analysing choices and preferences over schools is offered by Rothstein (2006) who notes that there will be greater sorting and stratification in schools when parents value peer group composition, rather than teaching effectiveness or other aspects of school 'quality' (under assumptions of 'single crossing' in preferences). His results indicate that parents do *not* value school effectiveness, but seem to exercise choice on the basis of schools' pupil composition.

Is it worth noting here that while economists in the field of education have focussed on *objective* test-based measures of school 'quality' and on preferences revealed by exercised choice, researchers in other fields have made more widespread use of self-reported assessments of quality and statements of wellbeing and preference. This difference is based partly on lack of alternative data in the economics of education, and partly because of a pervasive distrust of *subjective* judgements or stated measures of preference. This is understandable, and the validity of subjective measures has been scrutinized by economists with mixed results (see Bertrand and Mullainathan, 2001; and Krueger and Schakde, 2007). However, distrust might be partly misplaced and over-played in cases such as emotional wellbeing,

happiness, satisfaction with relationships, which are inherently subjective and unobservable to anyone apart from the individual experiencing them. In fact, other branches of economics have made much greater use of subjective statements of well being. For example, health economics researchers have studied the link between objective and self-reported measures of health status, as well as satisfaction with medical infrastructures (e.g. Baker et al., 2004), and linked these to general practioners' effectiveness.

More importantly, a growing literature has analyzed the determinants of individuals' happiness and wellbeing (see Layard, 2006 for an extensive review). Work in this field has studied numerous aspects of happiness including general trends over time (Blanchflower and Oswald, 2004), international comparisons (Alesina et al. 2004), and dissatisfaction with specific life dimensions (Van Praag et al. 2003). Others have studied specific contributory factors, such as labour market outcomes and income (Clark and Oswald 1994, 1996; Winkelmann and Winkelmann, 1998; Frijters et. al 2004a, 2004b; Ferrer-i-Carbonell, 2005; and Luttmer, 2005), education (Hartoog and Oosterbeek, 1998), smoking (Gruber and Mullainathan, 2002), religion (Dehejia et al., 2007), generosity (Konow and Early, 2008) and disability (Oswald and Powdthavee, 2008). Macroeconomic and institutional influences have also been analysed (Di Tella el al., 2001; and Frey and Stutzer, 2002). However, despite this wide ranging investigation and evidently growing interest in the topic, little has been said about the happiness and wellbeing of young students and their parents. We believe our paper provides a novel and interesting contribution to this stream of research by focussing on the correlates of pupils' wellbeing and parental satisfaction in relation to their school 'quality'. At present, this is a largely unexplored field.

3. Data and Methods

3.1. The data

The main data source for our analysis is the first wave of the Longitudinal Survey of Young People in England (LSYPE), which was administered to about 15,500 14-year-old (Year 9) pupils in about 600 secondary schools in England. Although young people are the primary focus of the LSYPE, the study also sought interviews with pupils' parents or carers in order to gather information on family

background. The LSYPE used a two-stage sampling framework that over-samples disadvantaged schools and then over-samples ethnic minorities within schools, giving on average 32 out of around 200 pupils per school. The sample is therefore not fully representative. Interviews were carried out January-February 2004, a few months before the 'Key Stage 3' standard tests in May of Year 9.

The pupil and main parent questionnaires in the LSYPE collect information on a rich set of pupil characteristics and family background characteristics. These include household composition, current and past family arrangements, and employment history and educational qualifications of the adults in the family. There are diverse questions about the emotional relationship between parents and children, leisure-time activities, and pupils' relationships with friends. Most importantly for our purpose, the survey includes an extensive set of questions regarding school enjoyment, bullying and school risk factors, satisfaction and general attitudes towards education. These questions were set in face-to-face interviews, or as part of a computer-based self-completion questionnaire. The responses to these questions are the focus of our analysis and will be described in great details in the next section.

Additionally, we match the LSYPE to various administrative data sets on school and pupil characteristics that are centrally collected and managed by the Department for Children, Schools and Families (DCSF). Since 1996, the National Pupil Database (NPD) holds information on each pupil's assessment record in standard national tests throughout their school career. Compulsory education in England is organised into five stages referred to as Key Stages. In the primary phase, pupils usually enter school at age 4-5 in the Foundation Stage and then move on to KS1, spanning ages 5-6 and 6-7. At age 7-8 pupils move to KS2, sometimes – but not usually – with a change of school. At the end of KS2, when pupils are 10-11, children leave the primary phase and go on to secondary school where they progress through KS3 to age 14. At the end of each Key Stage, prior to age-16, pupils are assessed on the basis of standard national tests. At age 16, at the end of the compulsory schooling, pupils sit GCSEs (academic) and/or NVQ (vocational) tests in a range of subjects.

From NPD, we extract KS2 and KS3 information on the mean test points in Maths, Science and English for the pupils in our sample, taking their KS3 in secondary school in 2004 and KS2 in primary

school in 2001. From this we create a measure of pupil value-added progress during secondary school by subtracting KS2 test scores from KS3 current test scores. We also construct measures of average school test scores using the population of pupils in various cohorts in the NPD, and measures of school effectiveness based on average KS2 to KS3 value-added. In the main analysis, average school level test-scores and value-added were constructed by aggregating achievement of all pupils in the LSYPE' participants' cohort (age 14 in 2004 and age 11 in 2001), and excluding the LSYPE respondents' own score. We also made use of older cohorts (e.g. KS3 in 2002 and 2003) in some sensitivity checks.

Additional information is joined in at school level, including institutional characteristics, school ethnic composition and size, numbers of teachers, and proportion of pupils eligible for Free School Meals (FSM). Finally, using school postcode identifiers, we are able to merge to our data several socio-economic characteristics of the geographical location of each school (from the 2001 Census of Great Britain). Appendix Table A1 presents and describes the set of characteristics that we include in our main analysis.

As for the housing market analysis, we use housing transactions data from the Government Land Registry and construct mean house prices in the locality of the schools represented in the LSYPE. School 'zoning' is only implicit in England, so there are rarely explicitly defined attendance zones. However, priority is given to students living close to the school when schools are oversubscribed. Thus, we rely on home-school travel patterns of pupils derived from pupil home postcodes to delineate *de facto* catchment areas, and work out which housing transactions postcodes fall into the catchment area of each school. More details about this procedure can be found in Appendix 2, and Gibbons et al. (2007a) and (2007b).

3.2. Subjective measures of wellbeing and satisfaction

The LSYPE contains a large number of questions regarding pupils' and parents' subjective perceptions of their school. We chose questions that relate to salient dimensions of the learning environment that are, at least in part, aligned with the goals of enjoyment, achievement and wellbeing set out in the 'Every Child Matters' agenda (referred to in the Introduction). For the child, we consider the following

dimensions: 1) Happiness at school; 2) Relationships with teachers; and 3) Intellectual stimulation. For the parent we consider overall rating of school quality, plus some dimensions that are comparable in style to aspects 2) and 3) of children's perceptions, namely: teachers' interest in the child and child progress at school.

Starting with the pupils, we build the following three binary indicators derived from a computer-based self-completion questionnaire covering the young person's attitudes to school. First, we construct a dummy (0-1) variable indicating whether the pupils is 'unhappy at school'. Pupils were asked to 'tick' their level of disagreement or agreement with the statement "I am happy when I am at school" on a four point scale. About 29% of children strongly agreed with this statement, 59% simply agreed, 9% disagreed and 3% strongly disagreed. We classify pupils in these last two categories as 'unhappy at school'. Following a similar approach, we create a binary indicator for whether a pupil gets 'bored in the lessons' and a binary indicator for whether the pupil 'dislikes teachers'. Full details about the original questions in the LSYPE and the way we recoded them are provided in Appendix 1. It is important to emphasize that when we used the original multi-valued variables provided in the survey and treated these as ordered variables (e.g. using ordered-probit regressions), we came to identical conclusions. However, binary outcomes 'capture' most of the empirical action and are more straightforward to present and interpret.

Next, we construct the following three binary outcomes for the parents. These are based on a face-to-face interview covering main parent's attitudes to their child's school and their involvement in education. First, we code a dummy (0-1) variable capturing whether the parent thinks the school is of good quality or not. We obtained this by rearranging the five possible answers to a question asking parents to rate the overall school quality. About 40% rated the school 'very good', 47% answered 'good', 9% 'neither good nor bad', 3% 'bad' and 1% 'very bad'. We classify parents in these last three categories as giving a 'low school quality rating'. Using a similar approach, we also construct a binary indicator that the parent is 'not satisfied with progress' of their child at school and a binary indicator that the parent is not satisfied with the interest teachers show in their child ('teachers not interested').

Appendix 1 reports full details about the original questions in LSYPE and they way these were recoded. Once more, we emphasize that our findings are unaffected if we use the original multi-valued information collected in LSYPE. Also note that we have coded these binary variables to represent dissatisfaction, unhappiness and unease with the school environment, but the results can easily be interpreted in terms of happiness and satisfaction by switching the sign of the relations presented in the regression analysis carried out in Section 3.

The questions from the parent and pupil questionnaires discussed here were chosen to relate best to the dimensions of happiness/school quality, teacher relations and intellectual stimulation/progress set out above. However, many alternatives could be chosen to represent any of these issues. For example, we could have used pupil agreement with the statement "on the whole I like being in school", to represent child happiness, and agreement with the statement "my teachers praise me when I do my school work", to represent relationships with teachers. In practice, it does not make much difference which of these many comparable measures we use when it comes to interpreting our main findings.

Before moving to a discussion of our empirical strategy, two important questions are worth asking: how much should we trust subjective measures of wellbeing and school satisfaction, and what do they really measure? Economists tend to be sceptical about the validity of subjective survey responses, and some scientific work partly backs this lack of trust (Bertrand and Mullainathan, 2001), although other recent evidence is more encouraging (Krueger and Schakde, 2007). Ample psychological evidence, cited for example in Frey and Stutzer (2002), Alesina et al. (2004) and Blanchflower and Oswald (2004), confirms that self-reported measures of happiness and satisfaction are valid and reliable. Subjective wellbeing data pass a variety of (what psychologists call) validation exercises. Happiness and satisfaction responses are correlated with a person's recall of negative events, assessment of a person's wellbeing by friends and family members, heart rate, blood pressure, digestive disorders and electroencephalogram measures of brain activity.

Note also that the measures we use here are not subjective assessments about wellbeing and satisfaction *in general*, rather specific questions on perceptions about school quality and enjoyment. The

same psychological research discussed above suggests that questions with a higher degree of specificity are more reliable. This is clearly the case when the topic is school quality, about which individuals have repeated and direct experience. Similarly, it is unlikely that respondents hold no opinion about school quality, mitigating what Bertrand and Mulainathan (2001) call the problem of 'non-attitude'.

In these respects, the questions asked by the survey to adult respondents are clearly specific, as are the pupil questions relating to boredom during lessons and dislike of their teachers. However, there is some ambiguity about responses to the statement "I am happy when I am at school", because children could be reflecting on their school experience specifically, or thinking more generally about their overall wellbeing (including their time in school). In either case, the response will be influenced by a child's general emotional state, individual experiences and family background, and not only by the characteristics of their school environment. Although conceptually relevant, this distinction is not crucial to the aim of our research. The only assumption we need to maintain is that school quality can, at least in theory, shape individual overall happiness and wellbeing. Given the amount of time pupils spend on the learning environment and the variety of experiences they are subject to when at school, we believe this is a tenable assumption.

3.3. Modelling approach

Using the data described above, we investigate the two research questions described in the Introduction, namely: a) To what extent are attitudes and experiences, amongst pupils and their parents, linked to standard test-score based measures of academic performance? b) To what extent are parents' perceptions of school quality linked to their children's happiness and enjoyment of school?

To do so, we use a regression-based approach and model attitudes along the six dimensions described in Section 3.2 above ($y_1, y_2, ..., y_6$) in terms of observable characteristics of the school (s), characteristics of the pupil and their family (x), and unobservable factors (ε_{ij}). To recap, our attitudinal dimensions are: 1) Child is unhappy at school; 2) Child is bored in school; 3) Child dislikes teachers; 4) Parent gives low school quality rating; 5) Parent is not satisfied with child's progress; and 6) Parent

thinks teachers not interested in their child. The explicit empirical model we use is a linear probability model of the form:

$$y^{*}_{ji} = s_i'\beta_j + x_i'\gamma_j + \varepsilon_{ji}$$
$$\Pr\left(y_{ji} = 1\right) = s_i'\beta_j + x_i'\gamma_j$$

where y^{*}_{ji} represents a latent unobservable attitudinal propensity and y_{ji} is one of our binary coded variables representing a (discrete) expression of that propensity as captured by the child or parent's questionnaire responses.

We estimate this model by Ordinary Least Squares (OLS), and also estimate the cross-equation correlations in terms of predictions and residuals. Correlations of the residuals provide an estimate of the correlation between unobservable factors that simultaneously affect the different attitudinal responses, $\rho^{*}_{jk} = Corr\left(\varepsilon_{ij}, \varepsilon_{ik}\right)$. Estimated correlations in unobservables, alongside with estimates of correlations between predictions from the various equations, i.e. $\hat{\rho}_{jk} = Corr\left(s_i'\hat{\beta}_j + x_i'\hat{\gamma}_j, s_i'\hat{\beta}_k + x_i'\hat{\gamma}_k\right)$, help us answer our question above about the extent to which parent and pupil attitudes are aligned and related to each other. We will also estimate some regressions that directly include school average unhappiness and child's own unhappiness as factors explaining parents' low school quality rating.

Note that the setup discussed above is equivalent to SURE estimation since we have the same regressors in each equation. We also experimented with a multivariate probit approach, and with ordered probit methods using the original multi-valued subjective measures. All these approaches yield nearly identical results.[2] One limitation in our data is that we do not have access to repeated observations for the same individual over time and therefore cannot use panel data techniques to control for fixed-over time individual unobservable characteristics.. However, the LSYPE does provide an extremely rich set of individual and family background characteristics allowing us to mitigate the problems induced in 'happiness' regressions by unobservable individual effects (Ferrer-i-Carbonell and Frijters, 2004). We

[2] This is in line with the results of the methodological investigation carried out in Ferrer-i-Carbonell and Frijters (2004).

will also provide robustness checks that suggest that parents' and pupils' subjective judgements of their school are not primarily driven by fixed-over time individual unobservable attributes.

The results of our analysis are presented in the next sections, starting with some descriptive statistics, followed by regression estimates of the model just explained.

4. Results and Discussion

4.1. Descriptive statistics

Table 1 presents descriptive statistics for the variables that are the focus of this research: pupil perceptions of their school (Panel A); parental perceptions of the school (Panel B); and pupil and school average test-scores (Panel C).

In the top two panels of Table 1, we find that about 12% of pupils in LSYPE are not happy at school, 42% get bored during the classes and 14% like none or hardly any of their teachers. Next, turning to parent responses, we see that 12% of parents in the LSYPE do not give their child's school a good overall rating, 9% comment that they are not satisfied with their child's progress at school and 14% report that the teachers do not get sufficiently interested in their child.

Looking further down at from Panel C, we note that school average test-scores confirm that LSYPE slightly over-represents schools enrolling pupils who have educational disadvantages, both in terms of intake at age 11 (KS2 scores are obtained at the end of primary school) and outputs at age 14 (KS3 scores). The national scores at these ages are 27.25 and 32.04 respectively (in the cohort of pupils aged 14 in 2004). This impression is further confirmed by the descriptive statistics for various school characteristics reported in Panel B of Appendix Table A1. LSYPE schools have a higher fraction of pupils eligible for Free School Meals and fewer pupils of white ethnic origins than we would find in a nationally representative sample, for which the figures would be 16.5% and 85.7% respectively. However, students interviewed in the LSYPE have marginally higher KS3 point scores and value-added than the other pupils in their schools. Note that in all the regression analysis that follow we will use

standardised (zero mean, unit standard deviation) versions of these test score variables to ease interpretation of the regression coefficients.

Additional analysis (not tabulated) tells us that the between-school variance of pupil attitudes and wellbeing at school is only 5.7-6.8% of the total variance in these measures. Clearly then, school-specific factors that are common to all pupils in the same school have a rather small role to play in shaping child enjoyment. The broad 'picture' is dominated by happy and unhappy pupils within the same schools, rather than happy pupils in some schools and unhappy pupils in others.

The role of school-specific factors seems more important when it comes to parents' judgement of school quality (as captured by 'parent gives low school quality rating'), explaining about 13% of the overall variance, although this is still a very low share indicating that parents at the same school differ widely in terms of their judgements about its quality. However, in terms of parents' perceptions of their children's progress and relationships with teachers, schools as a whole seem to have a fairly limited role to play, with a between-school variance accounting for less than 8% of the total variance in these measures. Thus, the largest share of the variance must be explained by observable or unobservable pupil or parent characteristics (or could simply be random responses, noise, misreporting or error). We now move on to our regression analysis, and study whether parent's and their child's attitudes to school are closely related to standard measures of their school's academic excellence.

4.2. Does school 'quality' boil down to good grades?

What is the relation between pupil wellbeing and the academic performance of their school? What is the link between parental satisfaction with the school and average school performance? To provide an answer to these two question we present results from the linear regression models described in Section 3.3, in which pupils' and parents' school perceptions are modelled as a function of school-average test score performance, controlling for pupils' own achievements and a battery of individual, school, family and neighbourhood related controls.

We start the discussion by presenting our findings for pupils' attitudes: these are tabulated in Table 2. Each set of three columns reports on a different dimension of pupil wellbeing, and in each set we report results that show the association between school mean value-added (KS2-age11 to KS3-age 14) and the pupil's attitude: i) Unconditional on any other characteristics; ii) Controlling for pupil characteristics, family background information, other school attributes and measures of quality of neighbourhood of residence; and iii) Controlling for pupil's own recorded KS2-to-KS3 progress and all other characteristics. The control variables included in our specifications are listed in Appendix Table A1, and the full set of coefficients for models of type iii) are reported in Appendix Table A2 (only for the dependent variable 'child is unhappy at school'). Note that pupil and school test result variables have been standardised, with zero mean and unit standard deviations.

Some interesting results emerge. First, higher school value-added over the period at which the child is at school, between ages 11 and 14, is associated with greater pupil wellbeing on all dimensions, though only marginally significant in the 'bored in lessons' model. School quality measured in terms of school-mates' value added is not, however, a very strong predictor of pupil wellbeing: the R-squared from these regressions is only around 0.1%. The magnitude of the coefficient implies that a one standard deviation improvement in school value-added is associated with a 1.2 percentage point (3.7% of one standard deviation) reduction in the proportion of pupils reporting unhappiness at school. This correlation between wellbeing and school value-added could arise because those pupils more prone to boredom and unhappiness tend to end up in lower value-added schools. In fact, controlling for pupil characteristics and family background information, as well as other school characteristics and neighbourhood quality, suggests that there is some truth in this conjecture: school value-added now has a smaller and non-significant association with reported happiness (Column 2). However, the relation between school-value added and reported boredom and dislike of teachers remains largely unchanged, though less statistically significant (Columns 5 and 8). Going on step further and controlling for a pupil's own progress between ages 11 and 14 (Columns 6 and 9), eliminates any statistically significant association between school

value-added and self-reported measures of wellbeing on all dimensions[3]. Note that in the specifications presented in Table 2, we computed school value added for pupil *i* as the mean value-added of pupils other than pupil *i* in his/her own school in the same cohort. If we instead use school-mean value-added based on older school cohorts, we find that there is never any association between pupil unhappiness, boredom or dislike of teachers, and school value-added (conditional on pupil characteristics), irrespective of the inclusion of pupil's own progress. This suggests that the significant association between school quality and a pupil's boredom and dislike of teachers is primarily related to the progress of pupils in his or her own cohort, not school quality as measured by value-added more generally.

Note that we also tried various interactions between school characteristics and pupil characteristics, to test for some heterogeneity in children's experience of the school environment. For example, we searched for 'big-fish small-pond' effects in academic self-concept (see Marsh, 2005 for a review) or gender differences in reported measures of wellbeing under competitive pressures (see Croson and Gneezy, 2004 for a review). However we found no interesting relationships of this type, either in interactions between school mean value-added and pupil value-added, or in differences by pupil free meal entitlement (a proxy for income), gender, or special educational needs.

Next, we discuss the findings from regressions that relate parental perceptions of school to average school test-scores. These are presented in Table 3. Each set of three columns reports on a different dimension of parental perception, and is structured in the same way as Table 2. The picture for parental perceptions is, however, markedly different from pupil wellbeing. Parental perceptions of low school quality, dissatisfaction with progress and lack of teacher interest are all significantly associated with the average value-added of pupils in the school, irrespective of whether we control for pupil, family, neighbourhood and school characteristics, and irrespective of whether we control for their own child's progress in the current school. A one standard deviation increase in school value added is linked to a 5.3

[3] In contrast, the coefficients on pupil's own progress in the models of unhappiness, boredom and disliking of teachers are all large and statistically significant, although the direction of causality is clearly arguable. For reference, Appendix Table A2 reports the coefficients on pupil's own value-added in the models of (un)happiness.

percentage point (15.8% of one standard deviation) increase in parents' school quality rating, even conditional on their own child's progress during KS3. For progress and perceptions of teachers, a one standard deviation increase in school value added is linked to a 2-2.5 percentage point (7% of one standard deviation) decrease in the proportion of parents reporting dissatisfaction. Note that we get similar results whether or not we control for pupils' own value-added, or if we re-compute school value-added from older cohorts[4], suggesting that parents' satisfaction with schools is indeed closely linked to the school's academic performance, irrespective of their child's own achievements. Lastly, we interacted the school test scores with indicators of parents' qualifications and background, to study whether school value-added plays a greater role in the judgements of more educated and higher income parents (Hastings et al., 2005), but found no such evidence.

Note finally that we also tried including general school level expenditure per pupil in our models of pupils' and parents' perceptions of the school environment (results not tabulated for space reasons), but found no evidence of a significant relation between general school resources and any of our attitudinal variables. Only when we broke down school expenditure into several components, we were able to detect a small positive association between computer-related resources and parental overall rating of school quality, and a marginally significant, negative association between expenditure for supply teachers and the same parental outcome.

So, what have we learnt so far? There is little sign of a positive relation between pupil wellbeing at school and value-added of the school. Prima-facie evidence suggesting that pupils seems happier and less bored and like their teachers more in schools with higher value-added completely disappears once we control for pupil's own progress. The reason why a pupil in a low value-added school is more likely to be unhappy, bored and to dislike the schools' teachers seems to be mainly related to his/her own lower progress. Pupils do not seem to care about school-quality as measured by test-based value added, except in so far as it is correlated with their own progress. The pattern for parental perceptions is in stark

[4] School rankings based on test-score performance are quite stable over the years for secondary schools sampled in LSYPE.

contrast to that of pupil wellbeing and enjoyment. Parents judge the school, the teachers and progress during classes on the basis of the school's value-added, even conditional on their own child's recorded academic progress. Stated differently, parental satisfaction with more academic aspects of school quality strongly relates to school average test-scores: the economist's 'working assumption' that parents tend to value schools on the basis of average attainment seems to be borne out by the data.

4.3. Some important robustness checks

So far we have only partly considered the potential role played by sorting of different types of parents and children into schools of different quality. In particular, the strong association between test-score based school quality and parents' satisfaction could arise if more easily-satisfied parents choose higher performing schools. Similarly, an association between school value-added and unhappiness could arise if more 'vulnerable' pupils end up in lower value-added schools. These are difficult cases to rule out empirically. Nevertheless, we report on three exercises that we believe provide some evidence that our findings are not spuriously related to unobserved family or pupil characteristics.

First of all, pupils and parents are reporting about *current* secondary school impressions. If the observed correlations between perceptions and school value-added arise only because of sorting of fixed types of individual into different schools, we would also find a similar correlation between *primary* school value-added and parent satisfaction in secondary school. This idea provides us with the basis for a falsification test that replaces secondary school value-added in Table 2 and Table 3, with mean test-scores for the primary school that the child last attended.[5] The results from this exercise show that primary school performance is *not* significantly related to reported perceptions of secondary-school once we control for secondary school fixed-effects to clear out potential correlation between primary and secondary characteristics. Secondly, we can also include primary school fixed effects in the

[5] Due to lack of data, we cannot calculate primary school value-added for the relevant cohort; however, school average KS2 performance still serves our purpose by proxying for primary school academic quality.

specifications of Table 2 and Table 3 to condition out fixed family and individual factors that influence primary and secondary school choice simultaneously, without any substantive change in the results. Finally, we have checked that household distress factors like poor health and financial difficulties – both closely linked to depression and unhappiness in the psychological and economic literature discussed above – are not related to secondary school value added. All these robustness checks provide further reassurance about the validity of our interpretations.[6]

4.4. Are parents and children's views about schools aligned?

The differential evidence on the role of test-score measures of school excellence in pupils' wellbeing and parents' perceptions of the school suggests that parents' and pupils' views on school quality are not closely aligned. In this section, we consider this question more systematically by looking at the cross-equation correlations discussed in Section 3.3.

Simple pair-wise correlations between the attitudinal variables of parent and child, shown in the upper right triangle of Table 4, provide a first-pass answer. The cross-correlations between parents' and child's views are very low ($r \leq 0.17$). More specifically, parents' low school quality rating is not closely linked to whether or not their child is happy ($r = 0.135$), bored ($r=0.098$) or dislikes teachers ($r=0.109$). Similarly, parents' dissatisfaction with progress and teachers is only weakly related to child unhappiness, boredom and dislike of teachers. The inter-correlations between pupil unhappiness and their own other attitudes (bored in lessons, dislikes teachers) are stronger ($r = 0.261$ to 0.295), and Cronbach's reliability Alpha for these three variables is around 0.64. Similarly, parents' school quality rating is quite strongly associated with their satisfaction with child progress and views of the teachers ($r = 0.33$ to 0.36), giving Cronbach's Alpha of 0.69. These findings provide some evidence that the individual responses are internally consistent. We next decompose these correlations into different components in order to shed more light on whether the views of parents and children share common ground in terms of their

[6] Results from these checks are not tabulated for space reasons. However, they are available from the authors upon request.

association with school characteristics, or whether any similarity is linked to the fact that children and parents share common observable family characteristics and common unobserved traits.

Firstly, in the lower-left triangle of Table 4, we present the partial correlations between linear predictions based on school characteristics from models with full specifications presented in Table 2 and Table 3 (school characteristics include all variables listed Appendix Table A1 Panel B and school standardized value-added). To start with, note that the adjusted partial R-squared associated to school characteristics in the models of pupils' attitudinal variables (Table 2) is always below 0.05% and F-tests on the joint significance of school characteristics (excluding school type dummies) never rejects the null of zero school-characteristics effect on the three measures of pupil wellbeing. On the other hand, the adjusted partial R-squared of school characteristics in the regressions focussing on parents' outcomes (Table 3) varies between 1% and 3.5%. Similarly, F-tests on the joint significance of school characteristics in models of parent's attitudinal variables strongly reject the null of zero effect for the parental outcomes. These findings suggest that, whereas school characteristics *overall* exert little influence on pupils' perception of their school, they tend to have a significant impact on their parents' views. Consistently, we find that the partial correlations based on school characteristics alone are moderate, and in one case have a negative sign, as shown in lower-left triangle of Table 4. Most notably the linear combination of school characteristics that predicts that a child is *unhappy* at school is positively correlated with the linear combination that predicts a *high* school quality rating amongst parents, reinforcing the idea that parents' and children's views about their school are not well aligned.

What drives the mildly positive link between pupils' and parents' perceptions shown by the raw correlation (top-right triangle of Table 4)? To answer this point, we present partial correlations between the linear predictions obtained using parent, family, neighbourhood and child characteristics in models presented in Table 2 and Table 3 (i.e. using characteristics described in Panels A, C, and D of Table A1 and pupil value-added to obtain linear prediction of various outcomes). These correlations tell us about the extent to which family background and neighbourhood characteristics together predict both child and parent responses (see the top-right corner of Table 5). Note that now the partial adjusted R-squared

associated with variables other than school characteristics is always relatively high for both pupils' and parents' outcomes, ranging between 2.6% and 8.3%. Similarly, F-tests on the joint significance of parent, family, neighbourhood and child characteristics in models of Table 2 and Table 3 always reject the null of a zero effect. The correlation coefficients from linear predictions excluding school characteristics are all high, and are almost as strongly correlated across responses from parent and child, as across different responses from the same individual. This suggests that family background and neighbourhood characteristics together have a strong association with parents' and their children's view of their school, and that these effects move in similar directions for parents and young people. Finally, note that unobserved factors that are uncorrelated with the child, family neighbourhood and school characteristics included in the regressions tend *not* to influence parents and children simultaneously: the lower left triangular panel of Table 5 shows weak correlations between the residuals from the models of Table 2 and Table 3.

Summarising, the correlation patterns presented here suggest that parent's and child's views about their school are related to each other mainly through observable family and contextual characteristics that parent and child share. On the other hand, their views of the school are not so closely linked through observable school characteristics, and even less closely linked once we take into account the low correlation in residuals that capture idiosyncratic unobserved characteristics. Another interesting feature that emerges from this analysis is that reported unhappiness, boredom and dislike for teachers tend to go hand in hand; similarly, parents' judgement of school quality and satisfaction with progress and teachers move in similar ways.[7] Given the similarity of results based on these different proxies, we will next focus only pupils' unhappiness and parents' overall school quality rating.

[7] This intuition is backed up by factor analysis (not tabulated, but available upon requests), which shows that pupil attitudes towards their learning environment and parent assessment of their schools can could be bundled together into single school 'quality' factors.

4.5. Do parents value school happiness?

The findings presented so far suggest that pupils do not seem to care much about school quality as measured by test-based value added. On the other hand, parental satisfaction with more academic aspects of the school is strongly related to school average test-scores. Moreover, the correlation between parents' and child's views about their school is mainly explained through observable family and contextual characteristics that parent and child share, while their perceptions of the learning environment are not closely linked through observable school characteristics. Does this mean that parent perceptions of school quality are unrelated to average child happiness and wellbeing at school?

In this section, we investigate this question directly by including school average pupil unhappiness directly as an explanatory variable in regression models of parents' overall low school quality rating (both unconditional and conditional on their own child's reported unhappiness). Results are reported in Table 6. Note that both school average value-added and the fraction of unhappy pupils at school are standardized to have unitary standard deviation.

Throughout the columns of Table 6 we see that parents *do* value average levels of school wellbeing: a one standard deviation increase in average levels of happiness would lead to a decrease in parental dissatisfaction of 2-2.7 percentage points (about 6.5-7.5% of one standard deviation). However, the most striking points from Table 6 are that school average value-added still enters the regression in Column 4 and 5 with a large and strongly significant coefficient, irrespective of whether or not we control for pupil own progress, and that value-added dominates school unhappiness in explaining parents' school satisfaction. A one standard deviation increase in value-added is associated with a 14.5-15.5% decrease in parental dissatisfaction, a response that is twice as large as that for average child unhappiness at school. Similarly, school value-added dominates child wellbeing in terms of significance as shown by the t-statistics of the two regressors (for example, 7.213 vs. 4.180 in Colum 5). In conclusion, school academic performance seems to play the dominant role in explaining parental overall rating of school quality.

4.6. Other correlates of school perceptions

We next briefly discuss which specific pupil, parent and background characteristics are associated with child enjoyment of the school environment and parents' satisfaction in our regressions. The literature on happiness and satisfaction has provided us with a series of 'stylized facts' about the determinants of happiness (see Blanchflower and Oswald, 2004), which we can used to benchmark our findings. The full set of regression coefficients from the models of Table 2 and Table 3 are presented in Appendix Table A2. Here we summarise some of the main features.

In line with other literature on adults, we find that male pupils tends to be less happy than females. Parental education, occupation, marital status and age are not strongly associated with pupils' wellbeing at school. Interestingly, doing sports regularly is associated with a lower probability of being unhappy, although variables capturing the pupils' relations with his/her friends (how often he/she went out during the past 7 days) are not significantly associated with reported pupil wellbeing. Finally, one of the strongest predictors of whether a child is unhappy at school is how well he or she gets on with the mother. Gibbons and Silva (2008) present more evidence on the determinants of child happiness and discuss the robustness of the findings reported here.

As for the parent , we find little evidence that age, marital status and occupation of the main parent affect his/her perception of school quality. This is at odds with the results discussed in the literature on happiness and wellbeing (e.g. that happiness is U-shaped in age, and that married people are happier). However, this is not entirely surprising as our dependent variables capture specific aspects of the school environment, *not* perceptions about general life-satisfaction, and all our adults are parents. Whereas the happiness literature reports that more educated people are happier generally, we find that more educated parents report higher levels of school *dis*satisfaction. This might be due to higher expectations about school quality. Also, parents in families with larger number of children report lower levels of satisfaction. Finally, in counterpoint to the finding of a strong link between maternal relationship and pupil happiness, there is no relation between parental assessment of school quality and how well they get

on with their children. The information we use about the quality of the relation between the child and his/her mother is pupil reported; however, we come to similar conclusion if we use the corresponding variable reported by the parent. This reinforces our argument that parental perceptions of the learning environment is well anchored to the school quality rather than reflecting unobservable individual characteristics.

4.7. Are parent perceptions revealed in local housing markets?

We motivated this research by arguing that most existing evidence on what parents 'value' in a school has been provided indirectly, by linking school characteristics to house prices prevailing in a school's catchment area. This literature has shown that parents are willing to pay a house-price premium to access schools with higher than average test scores. The findings discussed so far have provided direct evidence consistent with this claim: test-score based value-added has a prominent role in shaping parents' perceptions of school quality, even though this is not associated with child wellbeing over and above the role it plays in shaping the child's own academic progress. Additionally, we have provided some evidence that parents do value higher average levels of happiness at school, but their overall perception of school quality is dominated by academic performance. The implication of this is that test-score based measures of school quality should dominate subjective measures of pupil wellbeing at school in the patterns of parental demand for schooling 'quality' revealed in local house prices. In this section, we examine whether this conjecture is borne out by the data, by linking our subjective measures of school 'quality' to market house-prices in the school neighbourhood.

Although school attendance in England is not dictated by strict 'zoning', home-school distance becomes important for prioritising admission when schools are over-subscribed. We therefore use exact information on individual and school addresses (postcodes) and analyze home-to-school travel patterns to identify the *de facto* catchment areas in which we would expect to detect house price effects from school characteristics. The technical procedure for constructing these catchment areas is outlined in Appendix 2. To analyze how subjective measures of school 'quality' capitalize into house prices, we

average our data to create a school-level dataset of pupil, parent and neighbourhood characteristics, and join the imputed catchment area house prices to these data. The set of variables that we retain for this analysis is listed and described in Appendix Table A3. We use this dataset to run regressions that capture the association between subjective measures of school quality and average house prices in the school catchment areas, both conditional and unconditional on school standardised KS2-to-KS3 value-added. The results are presented in Table 7.

Column 1 reports the coefficients from regressions where we relate house prices to subjective school perceptions without any controls. We find that a higher fraction of unhappy pupils and a larger share of unsatisfied parents are significantly associated with lower house prices, with a ten percentage points increase linked to a 4.6 to 6.6% price reduction. This is consistent with the findings discussed in Section 4.5. Columns 2 shows that the coefficients are attenuated dramatically when we include school and catchment area characteristics in our specifications. Nevertheless a 10% decrease in the fraction of unhappy pupils at school still commands a 1.6%, and marginally significant, increase in house prices. In Colum 3, we further include standardised school KS2-to-KS3 value-added and, as expected, this is always significantly related to house prices. Although we cannot apply the robust identification strategies employed in modern research on house price responses to school quality, the results we obtain are in line with this literature: a one standard deviation increase in school value-added is associated with a 4.4 to 5.0% increase in house prices. However, conditional on school value-added, the fraction of unhappy pupils and the share of dissatisfied parents have no significant role to play in shaping local demand for housing. These results square quite well with the findings discussed in Sections 4.2, 4.4 and 4.5. Parental valuation of the school attended by their child is related to pupil happiness, but school value-added dominates parental views of academic excellence. Hence, conditional on school value-added, school happiness is not significantly related to local house prices, although the estimated effect still implies that a 10% increase in child happiness is associated to a 1% increase in house prices. Similarly, conditional on school academic performance, parents' subjective judgements of school quality are unrelated to house prices because school value-added already carries the most relevant 'signal' about academic standards.

Given that the school admissions system in England allows parents a certain degree of choice in schooling, and since parents can also exercise choice by moving home, it might seem surprising that any parents express dissatisfaction with the school attended by their child. The fact that 9-14% do express such dissatisfaction, and the fact that 12% of parents do not give their child's school a good quality rating indicates that choice or the supply of school quality might be constrained, or that quality might have changed after choices have been made such that parents do not find that their child is in their 'ideal' school. Thus, in the next section, we go on to consider the relationship between choice and the satisfaction expressed by parents, and between choice and pupil wellbeing.

4.8. The role of school choice

The LSYPE data contains a variety of information about the determinants of school choice. Parents were interviewed to ascertain whether the school currently attended by their child is the school of their choice, and the reasons why they chose it. Table 8 reports the proportions for these responses, alongside an indication of the mean relative performance of schools in each choice category (in terms of standardised school value-added). Note that parents can 'tick' several entries from a list of reasons for choosing the school.

Tabulations show that the current school is the preferred one for about 86% of respondents. The most popular responses on the reasons for the school choice is that it was the 'local school', 'easy to reach' or that siblings attend it. However, the possibility that the family chose their place of residence partly on the basis of schooling, and the fact that no reasons are given for the siblings' attendance, makes these findings rather empty. Amongst the more meaningful reasons given for choosing this school, 36.8% cite good performance table results, 30.1% say 'the pupil's friends attend it', and 7.8% chose on religious grounds. Only 5.7% say that concerns about bullying played a role. Similar results can be found in Flatley et al (2001). Value-added in schools of choice is only slightly above average (6.2% of one

standard deviation), and only schools chosen specifically for good performance, religion or little bullying show substantially higher performance than average (38% to 50% of one standard deviations).[8]

Does the exercise of choice make parents more satisfied and pupils happier? We provide some evidence on this point in Table 9 for our preferred measures of parent perceptions and child wellbeing. These specifications are comparable to those in Table 2 and Table 3, Column 3, but we have added in an indicator of whether the child's school was the family's preferred school, an indicator of whether the school was chosen for performance-related reasons, plus interactions between these indicators and school average value-added and pupils' own value-added (and a set of indicators for whether the school was chosen for any of the other reasons reported in the LSYPE; coefficients not tabulated).

As documented above, we find that pupils' reported unhappiness is related to their own value-added, but unrelated to their schoolmates' value-added. However, being in the school of choice, and especially one chosen for its performance, reduces the probability of being unhappy. For parents, school value added is again strongly related to parents' satisfaction with school quality. Interestingly, sensitivity of school quality judgements is particularly high when the school is *not* the preferred school (the main effect of school value-added in the first row of Column 3). Parents' judgements of school quality are instead much less responsive to school value-added when the school *is* the school of choice *and* when the school has been chosen for academic performance. The effect of school value-added for such parents is only around -2% per standard deviation, whereas it is nearly -8% for pupils who are not in the school of choice. These findings are consistent with the idea that parents who exercised 'choice', made reasonably good decisions and are satisfied with their chosen school.

[8] It is important to note that the LSYPE further asked parents about means used to acquire information about schools. Parents choosing a school on the basis of its performance table results and parents choosing it because of little bullying mainly used performance tables, information published in the media (an important vehicle in England for the circulation of school league-tables), and regularly attended open school-days. On the other hand, parents choosing local schools or schools attended by pupil's friends mainly relied on direct friends' referrals and advice from primary school teachers. Parents in the LSYPE thus seem to use a heterogeneous set of means to gather information about school quality.

All in all, the findings in this section confirm our conclusions that parents strongly value academic performance, and that school quality measures based on average test-scores are a good proxy for what drives parental assessment of school excellence. However, school quality along these dimensions does not have beneficial effects on pupil wellbeing at school and enjoyment of the learning environment.

5. Concluding Remarks

Economists in the field of education usually assume that parents value and choose schools on the basis of their average test-score performance. Direct evaluations of this hypothesis are rather rare, and considerations about wider notions of pupil wellbeing and enjoyment of the school environment are almost totally absent from the empirical literature in economics of education. This is surprising, especially in England, given the emphasis the recent education policy agenda has put on pupil happiness and wellbeing. Our research has made a start on filling in some of these gaps by studying the relation between performance-based measures of school quality, and subjective measures of enjoyment and satisfaction reported by pupils and their parents.

Our main aim was to answer the following two questions: a) To what extent are attitudes and experiences, amongst pupils and their parents, linked to standard test-score based measures of academic performance? and b) To what extent are parents' perceptions of school quality linked to their children's happiness and enjoyment of school? Our results show that parental satisfaction with school quality *is* strongly related to test-based measures of the progress in their child's school, even though their child's current enjoyment of school life is unrelated to the school's academic performance. Also, parents' judgements of school quality and satisfaction are only moderately correlated with their child's enjoyment. More generally, most of the correspondence between child and parent perceptions is more easily explained by shared family attributes and experience than by the observable characteristics of the school. Further, we have provided some evidence that subjective measures of school quality are capitalized into house prices but only *unconditionally* of standard test-based measures of school rankings

(such as school value-added). This reinforces the impression that school quality as measured by test scores tends to dominate parental perceptions of educational excellence.

What can we make of these results? On the one hand, we might be inclined to conclude that parents plainly make the wrong choice, i.e. the one that does not maximize their pupils' wellbeing at school. This could happen if parents do not have a complete and direct knowledge of the variety of experiences that shape their children's enjoyment of the learning environment. On the other hand, parents might simply be more 'forward looking' than their offspring, and willing to sacrifice some current welfare for greater returns in the future. In fact, pupil assessment of their school experiences might be distorted by myopia and 'self-control' problems characterizing young people aged 14, and not fully account for later-life satisfaction that better education leads to. We explore some of these issues in Gibbons and Silva (2008).

More generally, our findings provide some food-for-thought in the debate about school choice and sorting. It is often argued that programs that increase school choice might lead to greater stratification of schools along the lines of pupil ability and family background. Allegedly, this is because better-off parents care more about school quality, and they are in a better position at exercising informed school choice. These arguments go further in claiming that increased stratification is detrimental to pupils' learning, via peer effects, and more generally to pupil wellbeing and enjoyment of their time at school. Our results provide some interesting counter-arguments to these claims. First of all, we have provided some support for the economist's working assumption that parents *do care* about school quality and that average school test-scores are a good 'sufficient statistic' for what parents perceive as educational excellence. However, we found that this result is constant across the range of pupil abilities and their family background, suggesting that advantaged and disadvantaged parents place similar value on academic achievement. Moreover, pupil enjoyment at school is only very loosely related to school academic performance or its composition. This implies that policies that seek to address child wellbeing at school might have to be decoupled from policies that seek to raise academic standards. Broader concerns about the links between schools' academic performance and pupils' wellbeing find little empirical support from our research.

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Appendix 1: Details on Self-Reported Variables and Data Construction

In this Appendix we report the original phrasing of the questions in the LSYPE that we have used to create our subjective measures of pupil wellbeing at school and parental satisfaction with the school environment. We also report the way we recoded the original variables in order to create binary indicators, and percentages for each of the possible answers (in square brackets).

Subjective measures of pupil wellbeing

Below are some things young people have said about how they feel about school. For each statement please say whether or not you agree with it.

Unhappy at school
"I am happy when I am at school."
1. Strongly agree [29%]
2. Agree [59%]
3. Disagree [9%]
4. Strongly disagree [3%]
[recoded as the binary variable "Unhappy when at School": 1, 2 = 0; 3, 4 = 1]

Bored in lessons
"I am bored in lessons."
1. Strongly agree [9%]
2. Agree [33%]
3. Disagree [49%]
4. Strongly disagree [9%]
[recoded as the binary variable "Getting Bored at School": 3, 4 = 0; 1, 2 = 1]

Dislikes teachers
And how many of your teachers does the following statement apply to:
"I like my teachers."
1. All of my teachers [6%]
2. Most of my teachers [37%]
3. Some of my teachers [43%]
4. Hardly any of my teachers [11%]
5. None of my teachers [2%]
[recoded as the binary variable "Dislike teachers": 1, 2, 3 = 0; 4, 5 = 1]

Subjective measures of parental perceptions and satisfaction

Low school quality rating
How would you rate the overall quality of (name of pupil)'s school?
1. Very good [40%]
2. Fairly good [47%]
3. Neither good nor bad [9%]
4. Fairly bad [3%]
5. Very bad [1%]
[recoded as the binary variable “Not satisfied with School”: 1, 2 = 0; 3, 4, 5 = 1]

Not satisfied with progress
How satisfied have you been...
With (name of pupil)'s school progress in general?
1. Very satisfied [45%]
2. Fairly satisfied [45%]
3. Fairly dissatisfied [8%]
4. Very dissatisfied [2%]
[recoded as the binary variable “Little Progress in School”: 1, 2 = 0; 3, 4 = 1]

Teachers not interested
With how much interest the teachers show in (name of pupil)?
1. Very satisfied [40%]
2. Fairly satisfied [45%]
3. Fairly dissatisfied [9%]
4. Very dissatisfied [5%]
[recoded as the binary variable “Teachers not Interested in Pupil”: 1, 2 = 0; 3, 4 = 1]

Appendix 2: Estimating school attendance zones for housing market analysis

To define schools' local catchment areas for our housing market analysis, we use information on all secondary school pupils (ages 12 to age 16) being admitted to school between 2002 and 2005 (and not just the students surveyed by the LSYPE). We use information on the geographical coordinates of each school and its pupils' home addresses to create information about school-to-home direction-of-travel and actual travelled distance. From this information we define ten circular sectors centred on the school postcode, each containing 10% percent of the pupils attending that school from that direction. Next, for each direction sector, we compute the 75^{th} percentile of the home-school distance distribution for pupils attending the school from that direction (i.e. in that circular sector). Finally, we classify any postcode (whether or not it contains a pupil's home) as falling in the catchment area belonging to a school if it lies within the 75^{th} percentile of the travel-distance distribution in the direction sector in which it is located. More details about this procedure can be found in Gibbons et al. (2007a) and (2007b).

Using census data on house transactions in England between 2002 and 2005 (Land Registry "Pricepaid" data), we assemble information on house prices (and basic property characteristics) for the postcodes in each school catchment area, and then average these within each travel-zone to obtain an estimate of the market price of the properties and the average characteristics of these properties within the attendance zone of each school. This procedure provides us with a mean house price for each school. Additionally, we use information from GB Census 2001 and Land Registry data to obtain proxies for the characteristics of the catchment area, both in relation to its household composition (e.g. fraction of households with children or fraction of individuals of different ethnicities) and to its residential market characteristics (e.g. fraction of socially rented houses, fraction of sold houses that are freehold, detached, flat, etc.).

Tables

Table 1: Descriptive statistics; Main variables

Variable	Mean/Fraction	Std.Dev.	N. of Observations
Panel A: Pupils' Perceptions			
Unhappy at School	11.6%	-	12989
Bored in lessons	42.0%	-	12605
Dislikes teachers	13.6%	-	13272
Panel B: Parents' Perceptions			
Low school quality rating	12.8%	-	13572
Not satisfied with progress	9.9%	-	13572
Teachers not interested	14.2%	-	13572
Panel C: Pupil KS2 Points and School Scores			
Pupil KS3-KS2 Value Added	6.811	3.645	13030
Pupil KS3 Point Score (average English, Maths and Science)	33.615	6.337	13655
Pupil KS2 Point Score (average English, Maths and Science)	27.002	4.077	13164
School KS3-KS2 Value Added; 2003/2004	4.988	1.264	13762
School KS3 Point Score; 2003/2004	31.917	2.338	13762
School KS2 Point Score; 2003/2004	26.931	1.364	13762
School KS3-KS2 Value Added; 2003/2004, excluding pupil	5.002	1.259	12992
Standardised KS2 score, primary school of origin	26.907	1.762	13298

Note: LSYPE is a Survey sampling 14/15 year-old students (Year 9) in approximately 600 English secondary schools in 2004. The Survey over-represents students from poorer background and of ethnic origins. For information regarding original Survey questions and coding of pupils' and parents' perceptions refer to "Appendix: Details on Self-Reported Variables and Data Construction".

Table 2: Pupil wellbeing and attitudes towards the learning environment, and school average value-added

	Unhappy at School (11.6%)			Bored in lessons (42%)			Dislikes teachers (13.6%)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Standardised school value added	**-1.218	-0.581	-0.036	*-1.229	*-1.404	-0.331	**-1.225	*-1.158	-0.618
	(0.316)	(0.431)	(0.439)	(0.547)	(0.688)	(0.694)	(0.355)	(0.497)	(0.495)
Pupil, school, family and Census controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Standardised pupil value added	No	No	Yes	No	No	Yes	No	No	Yes
R-Squared	0.0014	0.0545	0.0641	0.0006	0.0768	0.0919	0.0013	0.0463	0.0551

Note: All dependent variables are binary indicators (see Table 1); specifications: linear probability models. Number of observations: approximately 12,000 in 600 schools, specifications without controls; approximately 11,000 in 590 schools, specification with controls. Standard Errors clustered at the secondary school level in round brackets. ** - 1% significance; * - 5% significance. Control variables described in Appendix Table A1. Census area characteristics refer to the Output Area of pupil's residence.

Table 3: Parental satisfaction and attitudes towards the learning environment, and school average value-added

	Low school quality rating (12.8%)			Not satisfied with progress (9.9%)			Teachers not interested (14.2%)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Standardised school value added	**-5.869	**-5.771	**-5.300	**-3.106	**-2.894	**-2.126	**-3.301	**-3.143	**-2.536
	(0.442)	(0.730)	(0.721)	(0.334)	(0.484)	(0.471)	(0.400)	(0.618)	(0.606)
Pupil, school, family and Census controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Standardised pupil value added	No	No	Yes	No	No	Yes	No	No	Yes
R-Squared	0.0311	0.0592	0.0662	0.0109	0.0597	0.0837	0.0089	0.0446	0.0550

Note: All dependent variables are binary indicators (see Table 1); specifications: linear probability models. Number of observations: approximately 13,000 in 600 schools, specifications without controls; approximately 11,000 in 590 schools, specification with controls. Standard Errors clustered at the secondary school level in round brackets. ** - 1% significance; * - 5% significance. Control variables described in Appendix Table A1. Census area characteristics refer to the Output Area of pupil's residence.

Table 4: Raw correlations (upper right) and correlations in predictions using school characteristics only (lower left) from models of attitudinal variables

	Child attitudes			Parent attitudes		
	Unhappy at School	Bored in lessons	Dislikes teachers	Low school quality rating	Not satisfied with progress	Teachers not interested
Unhappy at school	-	0.261	0.295	0.135	0.170	0.145
Bored in lessons	0.581	-	0.296	0.098	0.142	0.126
Dislikes teachers	0.625	0.819	-	0.109	0.135	0.130
Low school quality rating	-0.126	0.066	0.236	-	0.353	0.361
Not satisfied with progress	0.176	0.221	0.515	0.754	-	0.331
Teachers not interested	0.157	0.352	0.416	0.698	0.769	-

Note: Correlation of predictions using school characteristics only come from specifications including full set of controls, school standardized value added and pupil value added (Columns 3, 6 and 9 of Tables 2 and 3). School characteristics used for predictions using school characteristics only include school characteristics in Panel B of Appendix Table 1, and standardized school value-added.

Table 5: Correlations in prediction using set of controls excluding school characteristics (upper right) and correlations of unobservables (lower left) from models of attitudinal variables

	Child attitudes			Parent attitudes		
	Unhappy at School	Bored in lessons	Dislikes teachers	Low school quality rating	Not satisfied with progress	Teachers not interested
Unhappy at School	-	0.881	0.886	0.651	0.829	0.739
Bored in lessons	0.202	-	0.903	0.641	0.742	0.710
Dislikes teachers	0.265	0.246	-	0.709	0.775	0.745
Low school quality rating	0.108	0.070	0.076	-	0.760	0.743
Not satisfied with progress	0.124	0.085	0.089	0.318	-	0.861
Teachers not interested	0.116	0.079	0.100	0.328	0.293	-

Note: Correlation of predictions using set of controls excluding school characteristics and correlations of unobservables come from specifications including full set of controls, school standardized value added and pupil value added (Columns 3, 6 and 9 of Tables 2 and 3). Variables used for predictions using controls excluding school characteristics are: pupil, family and Census information (Panels A, C and D of Appendix Table 1), and standardized pupil value-added.

Table 6: Parental satisfaction with school quality, pupil wellbeing and school average value-added

	Low school quality rating (12.8%)			
	(1)	(2)	(3)	(4)
Standardized average school unhappiness	**2.791	**2.399	**2.055	**2.023
	(0.528)	(0.517)	(0.486)	(0.484)
Standardised school value added			**-5.286	**-4.894
			(0.686)	(0.678)
Pupil, school, family and Census controls	No	Yes	Yes	Yes
Pupil unhappy at School	No	Yes	Yes	Yes
Standardised pupil value added	No	No	No	Yes
R-Squared	0.0072	0.0633	0.0748	0.0797

Note: All dependent variables are binary indicators (see Table 1); specifications: linear probability models. Number of observations: approximately 11,000 in 590 schools, specification with controls. Standard Errors clustered at the secondary school level in round brackets. ** - 1% significance; * - 5% significance. Control variables described in Appendix Table A1. Census area characteristics refer to the Output Area of pupil's residence. Note that we only consider schools that include at least 10 LSYPE young respondents in order to calculate meaningful average levels of unhappiness from the survey

Table 7: School perceptions, school performance and local house prices

	(1)	(2)	(3)
Pupil: Unhappy at School			
Proportion of pupils unhappy	**-0.661	$-0.164	-0.105
	(0.246)	(0.100)	(0.100)
Standardised school KS2-KS3 value added	-	-	**0.046
			(0.010)
Parents: Low school quality rating			
Proportion of parents who give school low quality rating	**-0.460	-0.069	0.036
	(0.148)	(0.065)	(0.065)
Standardised school KS2-KS3 value added	-	-	**0.050
			(0.011)
School controls	No	Yes	Yes
Catchment Area controls (Census + Housing markets)	No	Yes	Yes
Number of Observations	558	558	556

Note: Regressions at the school level. Analysis only includes schools enrolling at least 10 LSYPE respondents. Robust Standard Errors in round brackets. ** - 1% significance; * - 5% significance; $ - 10% significance. Dependent variable is log of house prices prevailing in catchment area of the school in the period 2002-2005. Information obtained from Land Registry Data. All variables described in Appendix Table A6.

Table 8: School choice, descriptive information

Variable	Fraction	Standardized school value added
Pupil at school of choice?	0.861	0.062 (0.988)
Reason for choosing school (for pupils at school of choice):		
Local school	0.509	0.062 (0.9631)
Pupil's friends attend the school	0.301	0.055 (0.956)
School is easy to reach	0.398	-0.006 (0.980)
School has good performance table results	0.368	0.449 (0.897)
School has little bullying	0.057	0.377 (0.894)
School chosen on religious grounds	0.078	0.499 (0.977)
Pupil's sibling(s) attend(ed) the school	0.360	0.044 (0.976)
Pupil's parents or relatives attended the school	0.144	-0.026 (0.977)

Note: Parents can provide several reasons for choosing the school that the pupil currently attends. Information about reasons for choosing a school is not collected for pupils not at the school of their choice. Second column reports mean and standard deviation of standardized KS2-KS3 value added in round parenthesis (standardized value added for full pupil sample: mean zero, standard deviation one).

Table 9: Pupil wellbeing, parental perceptions, and school choice

	Child attitudes	Parent attitudes
	Unhappy at School (11.6%)	Low school quality rating (12.8%)
	(1)	(3)
Standardised school value added	0.519	**-7.638
	(0.982)	(1.307)
School of choice:	*-0.028	**-0.058
	(0.012)	(0.013)
… × Stand. school value added	-0.662	2.251
	(1.054)	(1.252)
… × Chosen for good performance	**-0.023	**-0.082
	(0.007)	(0.008)
… × Chosen for good performance x Stand. school value added	0.746	**3.703
	(0.785)	(0.710)
Pupil, school, family and Census controls	Yes	Yes
Standardised pupil value added	Yes	Yes
School of choice × Stand. pupil value added	Yes	Yes
Other school choice dummies	Yes	Yes

Note: All dependent variables are binary indicators (see Table 1); specifications: linear probability models. Standard Errors clustered at the secondary school level in round brackets. ** - 1% significance; * - 5% significance. Control variables described in Appendix Table A1. Census controls refer to the Output Area of pupil's residence. Other school choice dummies include: "School chosen because is the local school"; "School chosen because pupil's friends attend the school; "School chosen on religious grounds"; "School chosen because sibling(s) attend(ed) the school"; "School chosen because parents/relatives attended school"; "School chosen because it is easy to reach"; "School chosen because of little bullying". None of these dummies had sizeable and significant effects in any of the specifications. Number of observations: approximately 11,000 in 590 schools.

Appendix Tables

TableA1: Control variables, descriptive statistics

Variable	Mean/Fraction	Std.Dev.	N. of Observations
Panel A: Pupil Characteristics			
Male	0.503	0.500	13517
Native language English	0.761	0.427	13808
Pupil eligible for free school meals (FSM)	0.210	0.408	13680
Pupil has disabilities	0.127	0.333	13353
White ethnicity	0.623	0.485	13680
Black ethnicity	0.091	0.288	13680
Asian ethnicity	0.193	0.395	13680
Chinese ethnicity	0.002	0.047	13680
Other and mixed ethnicities	0.063	0.243	13680
Missing ethnicity	0.027	0.161	13680
Panel B: School Characteristics			
Number of pupils at school (FTE, total roll)	1128.39	335.57	13808
Number of qualified teachers (FTE)	66.91	20.69	13808
Fraction of pupils eligible for FSM	0.198	0.164	13808
Fraction of Whites in school	0.768	0.293	13808
Fraction of Blacks in school	0.054	0.107	13808
Fraction of Asian in school	0.133	0.227	13808
Fraction of Chinese in school	0.003	0.007	13808
Fraction of other and mixed ethnicity in school	0.042	0.048	13808
School is a: Community school	0.720	0.449	13808
Schools is a: Voluntary Aided school	0.117	0.321	13808
School is a: Foundation school	0.130	0.337	13808
School is a: Voluntary Controlled school	0.024	0.153	13808
School is a: City Technology College	0.007	0.086	13808
Panel C: Family Background			
Main parent's age	41.90	6.492	13651
Main parent's age squared (/100)	17.97	5.854	13651
Main parent is female	0.820	0.384	13693
Main parent has disabilities	0.226	0.418	13540
Pupil religious affiliation: None	0.313	0.464	13393
Pupil religious affiliation: Christian	0.458	0.498	13393
Pupil religious affiliation: Other	0.065	0.246	13393
Pupil religious affiliation: Muslim	0.164	0.370	13393
Pupil went out with friends, past 7 days: Never	0.226	0.418	13488
Pupil went out with friends, past 7 days: 1-2 times	0.328	0.470	13488
Pupil went out with friends, past 7 days: 3-5 times	0.241	0.428	13488
Pupil went out with friends, past 7 days: 6-more times	0.205	0.403	13488
Pupil does sport activities: Most days	0.336	0.472	13502
Pupil does sport activities: More than once a week	0.301	0.459	13502
Pupil does sport activities: Once a week	0.158	0.364	13502
Pupil does sport activities: Less than once a week	0.058	0.233	13502
Pupil does sport activities: Hardly ever	0.073	0.261	13502
Pupil does sport activities: Never	0.074	0.262	13502

(TableA1, continued: Control variables, descriptive statistics)

Pupil relation with mother: Very good	0.673	0.469	12655
Pupil relation with mother: Fairly good	0.302	0.459	12655
Pupil relation with mother: Fairly bad	0.020	0.139	12655
Pupil relation with mother: Very bad	0.005	0.072	12655
Main parent's education: Degree or equivalent	0.101	0.300	13569
Main parent's education: Higher education, below degree	0.120	0.325	13569
Main parent's education: GCE, A level or equivalent	0.132	0.338	13569
Main parent's education: GCSE grades A-C or equivalent	0.294	0.456	13569
Main parent's education: Other qualifications	0.091	0.288	13569
Main parent's education: No qualification	0.262	0.440	13569
Number of older siblings: 0	0.397	0.489	13326
Number of older siblings: 1	0.339	0.473	13326
Number of older siblings: 2	0.152	0.360	13326
Number of older siblings: 3	0.062	0.240	13326
Number of older siblings: 4	0.025	0.158	13326
Number of older siblings: 5 or more	0.025	0.158	13326
Main parent's marital status: Single	0.084	0.277	13646
Main parent's marital status: Married	0.658	0.474	13646
Main parent's marital status: Living with partner	0.068	0.252	13646
Main parent's marital status: Separated	0.059	0.236	13646
Main parent's marital status: Divorced	0.104	0.305	13646
Main parent's marital status: Widowed	0.023	0.150	13646
Main parent's marital status: Other	0.003	0.055	13646
Main parent's occupational status: Full-time employee	0.350	0.477	13562
Main parent's occupational status: Part-time employee	0.270	0.444	13562
Main parent's occupational status: Full-time self-employed	0.033	0.180	13562
Main parent's occupational status: Part-time self-employed	0.015	0.120	13562
Main parent's occupational status: Unemployed/Seeking work	0.028	0.164	13562
Main parent's occupational status: Full-time education	0.013	0.112	13562
Main parent's occupational status: Sick/disabled	0.036	0.186	13562
Main parent's occupational status: Looking after home	0.237	0.425	13562
Main parent's occupational status: Retired	0.010	0.102	13562
Main parent's occupational status: Other	0.006	0.080	13562
Panel D: Census OA Information			
Fraction of properties owned	0.652	0.264	13626
Fraction of properties socially rented	0.233	0.251	13626
Fraction of properties privately rented	0.094	0.097	13626
Average household size	2.571	0.468	13626
Average number of room per dwelling	5.315	0.857	13626
Fraction of people with No qualifications	0.325	0.134	13626
Fraction of people with Level 1 qualifications	0.166	0.049	13626
Fraction of people with Level 2 qualifications	0.185	0.048	13626
Fraction of people with Level 3 qualifications	0.077	0.042	13626
Fraction of people with Level 4-5 qualifications	0.180	0.116	13626
Fraction of people with other qualifications	0.067	0.025	13626
Fraction of religiously affiliated individuals: Christian	0.658	0.191	13626
Fraction of religiously affiliated individuals: Other	0.126	0.204	13626
Fraction of religiously affiliated individuals: None	0.216	0.081	13626
Fraction of White individuals	0.820	0.248	13626
Fraction of Black individuals	0.039	0.080	13626
Fraction of Asian individuals	0.112	0.205	13626
Fraction of Chinese individuals	0.010	0.019	13626
Fraction of Other ethnicity individuals	0.022	0.027	13626

Note: fractions may not sum to 1. This is due to rounding or partially missing information. Information on "Pupil relation with mother" is pupil reported:

Table A2: Determinants of pupil and parental perceptions of the learning environment

	Child attitudes	Parent attitudes
	Unhappy at School	Low school quality rating
	(1)	(3)
Standardised pupil value added	**-3.478 (0.345)	**-3.090 (0.362)
Native language English	-0.001 (0.015)	0.025 (0.017)
Pupil eligible for Free School Meals (FSM)	0.006 (0.011)	-0.020 (0.011)
Male	0.026 (0.007)**	-0.000 (0.006)
Pupil has disabilities	0.006 (0.009)	0.018 (0.010)
Asian ethnicity	-0.028 (0.018)	-0.031 (0.023)
Black ethnicity	-0.024 (0.015)	0.007 (0.016)
Chinese ethnicity	0.058 (0.078)	-0.036 (0.048)
Other and mixed ethnicities	0.003 (0.015)	0.023 (0.015)
Missing ethnicity	-0.002 (0.019)	0.032 (0.025)
Number of pupils at school (x100)	-0.002 (0.003)	0.007 (0.005)
Number of qualified teachers (x100)	0.005 (0.054)	-0.141 (0.080)
Fraction of pupils eligible for FSM (x100)	-0.088 (0.038)*	-0.030 (0.056)
Fraction of Asian in school (x100)	0.038 (0.024)	0.018 (0.033)
Fraction of Blacks in school (x100)	0.010 (0.068)	0.175 (0.074)*
Fraction of Chinese in school (x100)	0.484 (0.442)	-0.731 (0.543)
Fraction of other/mixed ethnicity (x100)	0.108 (0.010)	0.055 (0.131)
Schools is a: Voluntary Aided School	-0.001 (0.009)	-0.043 (0.011)**
School is a: Voluntary Controlled School	-0.047 (0.012)**	-0.018 (0.016)
School is a: Foundation School	-0.003 (0.009)	0.002 (0.015)
School is a: City Technology College	-0.058 (0.025)*	-0.046 (0.026)
Main parent's age (x100)	-0.067 (0.505)	-0.598 (0.492)
Main parent's age squared/100 (x100)	-0.002 (0.581)	0.361 (0.552)
Main parent is female	-0.004 (0.009)	-0.013 (0.010)
Main parent has disabilities	0.012 (0.008)	0.009 (0.009)
Pupil out with friends, past 7days: 1-2 times	-0.013 (0.008)	-0.009 (0.008)
Pupil out with friends, past 7 days: 3-5 times	-0.004 (0.009)	0.002 (0.009)
Pupil out with friends, past 7 days: 6-more times	0.021 (0.011)*	0.009 (0.010)
Pupil does sport: More than once a week	0.012 (0.007)	-0.009 (0.008)
Pupil does sport: Once a week	0.017 (0.009)	-0.004 (0.009)
Pupil does sport: Less than once a week	0.029 (0.015)	-0.013 (0.013)
Pupil does sport activities: Hardly ever	0.045 (0.014)**	0.015 (0.013)
Pupil does sport activities: Never	0.091 (0.015)**	0.031 (0.015)*
Pupil religious affiliation: Christian	-0.019 (0.007)**	-0.010 (0.008)
Pupil religious affiliation: Other	-0.030 (0.019)	0.044 (0.024)
Pupil religious affiliation: Muslim	-0.048 (0.019)**	0.014 (0.024)
Pupil relation with mother: Fairly good	0.053 (0.007)**	0.015 (0.007)*
Pupil relation with mother: Fairly bad	0.181 (0.031)**	0.026 (0.026)
Pupil relation with mother: Very bad	0.311 (0.065)**	0.020 (0.047)
Main parent's education: HE, below degree	-0.007 (0.012)	-0.003 (0.013)
Main parent's education: GCE, A level or equiv.	-0.014 (0.012)	-0.028 (0.012)*
Main parent's education: GCSE A-C or equiv.	-0.015 (0.011)	-0.039 (0.010)**
Main parent's education: Other qualifications	-0.017 (0.013)	-0.025 (0.014)
Main parent's education: No qualification	-0.034 (0.012)**	-0.041 (0.013)**
Number of older siblings: 1	0.021 (0.008)**	0.019 (0.008)**
Number of older siblings: 2	0.039 (0.010)**	0.044 (0.010)**
Number of older siblings: 3	0.032 (0.014)*	0.022 (0.014)
Number of older siblings: 4	0.036 (0.020)	0.054 (0.022)*
Number of older siblings: 5 or more	0.080 (0.024)**	0.063 (0.026)*

(TableA2, continued: Determinants of pupil and parental attitudes)

Main parent's marital status: Married	-0.037 (0.015)*	-0.028 (0.014)
Main parent's marital status: Living with partner	-0.030 (0.018)	-0.024 (0.018)
Main parent's marital status: Separated	-0.042 (0.019)*	-0.028 (0.019)
Main parent's marital status: Divorced	-0.016 (0.018)	0.004 (0.017)
Main parent's marital status: Widowed	-0.034 (0.025)	-0.041 (0.024)
Main parent's marital status: Other	-0.103 (0.041)*	0.013 (0.077)
Main parent's occupation: PT employee	0.024 (0.008)**	-0.000 (0.007)
Main parent's occupation: FT self-employed	0.000 (0.015)	-0.028 (0.016)
Main parent's occupation: PT self-employed	0.017 (0.025)	0.007 (0.024)
Main parent's occupation: Unempl./Seeking work	0.004 (0.021)	0.051 (0.024)*
Main parent's occupation: FT education	-0.002 (0.026)	-0.004 (0.030)
Main parent's occupation: Sick/disabled	0.018 (0.018)	0.041 (0.021)*
Main parent's occupation: Looking after home	0.029 (0.010)**	0.009 (0.010)
Main parent's occupation: Retired	0.056 (0.051)	0.017 (0.045)
Main parent's occupation: Other	0.068 (0.045)	0.012 (0.043)
Pupil Value Added + School Value Added	Yes	Yes
Census characteristics	Yes	Yes

Note: All dependent variables are binary indicators (see Table 1); specification: linear probability models. Column (1) reports additional coefficients from the regression in Column (3) of Table 2. Column (2) reports additional coefficients from the regression in Column (3) of Table 3. ** - 1% significance; * - 5% significance. Excluded dummy categories are: White ethnicity; Schools is a: Community school; Pupil out with friends, past 7 days: Never; Pupil does sport activities: Most days; Pupil religious affiliation: None; Pupil relation with mother: Very good; Main parent's education: Degree or equivalent; Number of older siblings: 0; Main parent's marital status: Single; Main parent's occupation: Full-time employee. Census characteristics described in Appendix Table A1; regression coefficients not reported.

Table A3: Descriptive statistics of variables for the housing costs analysis - school level analysis

Variable	Mean/Fraction	Std.Dev.	N. of Obs.
Panel A; Main Variables			
Log of house prices in school catchment area (average 2002-2005)	11.995	0.449	558
Fraction of pupils unhappy when at school	0.117	0.074	564
Fraction of pupils bullied at school: Threatened	0.194	0.097	564
Fraction of parents not satisfied with school	0.128	0.122	564
Fraction of pupils bullied, reported by parent: Threatened	0.127	0.088	563
School KS2-KS3 Value Added	4.961	1.271	562
Panel B: School controls			
Number of pupils at school (FTE, total roll)	1128.14	334.84	564
Number of qualified teachers (FTE)	66.886	20.567	564
Fraction of pupils eligible for free school meals (FSM)	20.027	16.348	564
Fraction of Whites in school	0.763	0.288	564
Fraction of Blacks in school	0.060	0.111	564
Fraction of Asian in school	0.128	0.216	564
Fraction of Chinese in school	0.004	0.007	564
Fraction of other and mixed ethnicity in school	0.045	0.050	564
School is a: Community school	0.714	0..452	564
Schools is a: Voluntary Aided school	0.122	0..328	564
School is a: Foundation school	0.131	0.338	564
School is a: Voluntary Controlled school	0.023	0.150	564
School is a: City Technology College	0.007	0.084	564
Schools is an: Academy	0.002	0.042	564
Panel D: Catchment area controls (Census + Housing markets)			
Average distance between school and home transactions	2281.16	1094.86	558
Fraction of sold houses that are: New building	0.031	0.019	558
Fraction of sold houses that are: Freehold	0.787	0.193	558
Fraction of sold houses that are: Detached	0.185	0.146	558
Fraction of sold houses that are: Flat	0.152	0.177	558
Fraction of sold houses that are: Semi-detached	0.317	0.134	558
Fraction of sold houses that are: Terrace	0.346	0.153	558
Fraction of properties owned	0.686	0.123	558
Fraction of properties socially rented	0.184	0.097	558
Fraction of properties privately rented	0.110	0.057	558
Fraction of households with dependent children	0.304	0.047	558
Average household size	2.416	0.182	558
Fraction of White individuals	0.861	0.161	558
Fraction of Black individuals	0.033	0.053	558
Fraction of Asian individuals	0.080	0.117	558
Fraction of Chinese individuals	0.011	0.011	558
Fraction of Other ethnicity individuals	0.021	0.017	558

Note: Descriptive statistics include schools enrolling at least 10 LSYPE respondents. Fractions may not sum to 1. This is due to rounding or partially missing information.