

Assessing School Quality: Academic Standards, Pupil Wellbeing and Parental Satisfaction

Olmo Silva

(Dept. of Geography and Environment and CEP, LSE)

Joint with S. Gibbons

The context: school quality and school choice

- Choosing school is a demanding and crucial ‘task’ for parents trying to obtain access to good education
 - Altruistic and motivated parents know that education is a highway to a brighter future for their children (better labour mkt outcomes, health, etc.)
 - Thus they care about the human-capital accumulation of their offspring
- Economists have assumed that parents value and choose schools on the basis of test outcomes
 - Standardized test and publication of performance tables partly explain this focus: stimulate accountability; allow parents ‘informed’ choice, etc.
- However, measuring *directly* parental preferences for school ‘quality’ has been difficult and is still an unexplored field
 - Only recent exception, paper by Jacobs/Lefrgren on parents choosing teachers within schools

The context continued: preferences for ‘quality’

- To assess parental preferences *indirectly*, researchers have linked school performance to house prices
 - Capitalization of school performance should represent the hedonic price of access to school ‘quality’, thus revealing something about parents’ prefs
 - This interest is (partly) due to the observation that school access is one of the main factors determining residential location of families
- Theoretically, the approach is grounded in Rosen’s study on implicit markets and hedonic prices + Tiebout on local public goods
- Empirical applications have focused on trying to identify the implicit price for school ‘quality’
 - Rather than estimating a full demand system for school quality in a setting with parents with heterogeneous preferences: challenging task...

The context continued: houses and school 'quality'

- Black (1999) set a corner stone in the field by comparing prices across school district boundaries
 - 'Zoning' determines school access in the US context
 - Discrete jumps of school 'quality' across boundaries should be capitalized into house prices if parents are willing to pay for it
- Gibbons and Machin (various) follow a similar approach for the UK
 - No strict zoning but Local Education Authorities boundaries provide sufficiently high school-attendance barriers
- The consensus estimate seems to be 4% increase in house prices for a 1 std.dev. in school test scores
- Papers that follow a more structural approach (e.g. Bayer et al., 2003) come to similar conclusions

The context continued: what is school 'quality'?

- But what is school quality? What aspects of school quality are valued?
- The literature on house prices sheds some light on the importance of test performance dimension for school choice (via residential location)
 - *Remark 1*: parents value *actual* school performance, conditional on intake; not preference for segregation...
 - *Remark 2*: Even though sometimes they 'get it wrong': pay more for congested schools; herding and reputation behaviour...
- However, parents often claim choosing schools using different criteria
 - Only 40% of parents in our sample claim they choose school based on performance (although 86% are at the school of their choice)
 - "I only want my child to be happy at school!" is not an un-heard claim...

The context continued: emphasis on pupil wellbeing

- In current UK policy context, pupil happiness/wellbeing deemed crucial
 - Causally linked to standards and learning of pupils in schools (DfES)
- ‘Every Child Matters’ agenda proposes changes to education services to help young people achieve their “(...) most valued goals”
 - These include enjoyment of the school environment, health and safety (i.e. little bullying), parental engagement, good relations with teachers...
- Despite current focus, little evidence that what parents value is associated to pupils’ happiness
 - House price research suggest parents value performance; but is this mirrored in higher levels of pupil enjoyment of the school?
- We try to bridge this gap: assess school ‘quality’ by linking academic standards to pupil wellbeing/parental satisfaction

What do we do? Using subjective evaluations...

- Economists have focussed on test-based measures of school quality often for lack of alternatives (data)
- Yet other disciplines have made wide use of self-reported assessments
 - E.g. health economics and valuation of General Practitioners
- We follow a similar path and study the relation between
 - Performance-based measures of school quality and...
 - Subjective measures of school enjoyment/satisfaction, by parents and pupils
- Also study whether 'soft' quality measures are capitalized into house prices
- Hope to answer two main research questions
 - Are academic standards a good proxy for what parents value?
 - To what extent parental preferences for quality and pupil wellbeing are aligned?

How do we do it? LSYPE and English schools data

- Simple descriptive approach exploiting richness of data (not causal)
- Main dataset is LSYPE, survey sampling about 14,000 14-year old students in 600 Secondary schools in England
 - Sampling is schools, then pupils within schools (not a census)
 - Slightly over-representing disadvantaged areas/schools
 - Interview students when taking their KS3, age-14 exam, in middle of Secondary schooling
- Survey contains detailed information about pupil characts., family background, relations with parents, leisure activities and...
- School enjoyment, satisfaction and general attitudes towards education, reported by pupils and parents (interviewed separately)
- These are the focus of our analysis

More on the LSYPE and English schools data

- Main dataset can be further linked to pupil test score performance...
 - Current (age 14, Secondary school) and lagged (aged 11, end of Primary)
- And school characteristics; these include
 - Size, ethnic composition, total number of teachers, institutional type, and...
 - Average test performance of students in the school; what do we use?
 - Same tests (age 11 and age 14) collected for pupils in LSYPE, i.e.
 - Age 14: measures current school performance; age 11: captures school 'quality' intake (end of Primary, before starting Secondary)
- An aside on test scores: centralized, standardized, publicly available (performance tables/newspapers), high stakes...
- Finally, link data to house prices prevailing in school neighbourhoods + characteristics of residential markets + Census information

LSYPE: subjective measures of school quality

- Measuring test-based school quality rather simple exercise
 - Standardized tests; use age 14 and 11, disentangle ‘peers’ vs. ‘effectiveness’
- LSYPE contains a variety of measures of enjoyment and satisfaction with various aspect of learning environment
- We only choose a few which represent important aspects of education
- For pupils, we construct the following variables
 - A binary indicator taking value 1 if pupil reports being *unhappy* at school
 - A binary indicator taking value 1 if pupil says he/she gets *bored* at school
 - A binary indicator taking value 1 if pupil claims *not getting on* with teachers
 - A binary indicator taking value 1 if pupil reports being *bullied* (threatened)
- Other indicators (e.g. bullying: physical violence) contain similar info

More on subjective measures of school quality

- For parents, we construct similar variables
 - A binary indicator taking value 1 if parent *not satisfied* with school in general
 - A binary indicator taking value 1 if parent reports *little progress* in school
 - A binary indicator taking value 1 if parent thinks *teachers not interested* in student
 - A binary indicator taking value 1 if parent reports children has been *bullied* at school (threatened)
- Indicators multi-valued in survey
 - Recoding as binary does not affect our results
- Generally, variables capture ‘dissatisfaction’/un-ease with school
- Also, they represent salient features of learning environment
 - General enjoyment/satisfaction; pupil interest and relevance of learning; pupil relation with teachers; pupil relation with his/her peers

Subjective measures of ‘quality’: a description

<u>Pupil perceptions</u>	<u>Correl.</u>	<u>Parental perceptions</u>
Pupil unhappy: 0.116 (sd 0.321) [btw var.16%]	0.135	Parent dissatisfied: 0.128 (sd 0.334) [btw var.23%]
Pupil gets bored: 0.420 (sd 0.494) [btw var.13%]	0.142	Parent reports little progress: 0.099 (sd 0.299) [btw var.26%]
Pupil dislikes teachers: 0.136 (sd 0.342) [btw var.14%]	0.130	Parent says teachers not interested: 0.142 (sd 0.350) [btw var.18%]
Pupil gets bullied: 0.193 (sd 0.394) [btw var.16%]	0.341	Parent reports pupil bullied: 0.129 (sd 0.335) [btw var.26%]

- Pupil and parental perceptions, despite measuring similar things, do not strongly correlate; especially top three indicators...

Pupil perceptions of 'quality': correlations

Cross-Correlations	<u>Unhappy</u>	<u>Bored</u>	<u>Dislikes Teachers</u>	<u>Bullied: Threatened</u>
<u>Unhappy</u>	1.000			
<u>Bored</u>	0.261*	1.000		
<u>Dislikes Teachers</u>	0.295*	0.296*	1.000	
<u>Bullied: Threatened</u>	0.148*	0.095*	0.053*	1.000

- What do we learn? Unhappy, bored, dislikes teachers: quite correlated; bullied is another 'dimension'! Factor analysis confirms this impression...
- Correlation of residuals from system of probit regressions controlling for individual characteristics confirms marked split between bullying/other factors

Parental perceptions of 'quality': correlations

Cross-Correlations	<u>Not satisfied</u>	<u>No Progress</u>	<u>Teach. not interested</u>	<u>Bullied: Threatened</u>
<u>Not satisfied</u>	1.000			
<u>No Progress</u>	0.353*	1.000		
<u>Teach. not interested</u>	0.361*	0.331*	1.000	
<u>Bullied: Threatened</u>	0.136*	0.129*	0.112*	1.000

- Here too find that first three components quite correlated; but bullied is another aspect of 'soft' measures of quality (same with factor analysis/probits)
- Anticipating: we will detect this same 'split' in regression analysis results

Measures of test-based school performance

- Use age-11 and age-14 grades in standardized tests; averaged over school and across three core subjects (English, Maths, Science)
- Use raw point scores; alternative: percentiles; gave same results
- Summary statistics are pretty 'normal' compared to national standards
 - Key Stage 3 (age 14): mean 31.19; sd 2.338
 - Key Stage 2 (age 11): mean 26.93; sd 1.346
 - Value-added (KS3-KS2): mean 4.99; sd 1.264
- Slightly higher for pupils in LSYPE (sampling within schools)
 - Respectively: 33.61; 27.00; 6.88
- Use KS3 conditional on KS2, or value-added; link satisfaction to school effectiveness, controlling for peer-type 'quality'
- Include extensive set of controls (pupil, background, neighbourhoods...)

Regressions: pupil perceptions and school grades

Regression coeffs (std.err.) x100	<u>Unhappy</u>	<u>Bored</u>	<u>Dislikes</u> <u>Teachers</u>	<u>Bullied:</u> <u>Threatened</u>
School KS3 Score	-0.117 (0.341)	-0.451 (0.564)	-0.629 (0.402)	-1.029 (0.489)*
School KS2 Score	0.285 (0.508)	0.898 (0.878)	1.171 (0.637)	-0.381 (0.793)
Pupil KS3 Score	-0.881 (0.096)**	-1.762 (0.141)**	-0.977 (0.097)**	-0.355 (0.118)**
Pupil KS2 Score	0.426 (0.142)**	1.144 (0.217)**	0.858 (0.142)**	0.029 (0.163)
School Value-added	-0.097 (0.346)	-0.269 (0.552)	-0.517 (0.389)	-1.246 (0.475)**
Pupil Value-added	-0.961 (0.094)**	-1.878 (0.139)**	-1.001 (0.096)**	-0.408 (0.119)**
Controls	Yes	Yes	Yes	Yes

- Little evidence that measures of school quality based on test scores relate to pupil enjoyment of learning environment. Only marginally for bullying...

Regressions: parent perceptions and school grades

Regression coeffs (std.err.) x100	<u>Not</u> <u>satisfied</u>	<u>No</u> <u>Progress</u>	<u>Teach. not</u> <u>interested</u>	<u>Bullied:</u> <u>Threatened</u>
School KS3 Score	-3.712 (0.560)**	-1.651 (0.378)**	-1.927 (0.481)**	-0.116 (0.424)
School KS2 Score	0.425 (0.830)	1.179 (0.557)*	0.983 (0.699)	-0.809 (0.694)
Pupil KS3 Score	-0.838 (0.101)**	-1.271 (0.093)**	-1.068 (0.104)**	-0.703 (0.100)**
Pupil KS2 Score	0.527 (0.146)**	0.508 (0.130)**	0.685 (0.151)**	-0.085 (0.145)
School Value-added	-4.293 (0.567)**	-1.717 (0.373)**	-2.092 (0.473)**	-0.237 (0.425)
Pupil Value-added	-0.880 (0.099)**	-1.404 (0.092)**	-1.132 (0.103)**	-0.847 (0.100)**
Controls	Yes	Yes	Yes	Yes

- Compelling evidence that parental satisfaction with learning environment is related to test-based school quality (not peers). Not much evidence for bullying

Discussion of results so far...

- Correlations and regressions suggest that enjoyment/satisfaction of learning environ. and school 'safety' are different aspects of quality
 - Next tables focus on unhappy/dissatisfied and bullying for simplicity
- Find quite strong evidence that parental satisfaction with learning and quality of education strongly relates to test-based school ranks
 - The economist 'working assumption' that parents value/choose schools on the basis of average achievement is borne out by the data...
- However, this standard dimension of school 'quality' is not associated with what makes pupils happy
- What next? The role of school choice and capitalization of school quality perceptions into house prices...

School choice, pupil perceptions and school grades

Coeffs (std.err.) x100	<u>Unhappy</u>		<u>Bullied: Threatened</u>	
	All pupils	At school of Choice	All pupils	At school of choice
School Value-added	0.089 (0.335)	0.301 (0.374)	-1.210 (0.482)*	-1.115 (0.534)*
Pupil Value-added	-0.953 (0.094)**	-0.939 (0.102)**	-0.374 (0.119)**	-0.471 (0.128)**
School of choice	-0.025 (0.011)*	--	-0.019 (0.014)	--
School chosen for good grades	-0.023 (0.007)**	-0.022 (0.007)**	-0.004 (0.009)	-0.004 (0.009)
Chosen for little bullying	-0.027 (0.011)*	-0.027 (0.012)*	-0.034 (0.017)*	-0.033 (0.016)*
Controls + other choice dummies	Yes	Yes	Yes	Yes

- Other school choice dummies (e.g. 'chosen on religious grounds' or 'chosen because local school') have non-significant effects

School choice, parent perceptions and school grades

Coeffs (std.err.) x100	<i>Not Satisfied</i>		<i>Bullied: Threatened</i>	
	All pupils	At school of Choice	All pupils	At school of choice
School Value-added	-3.676 (0.543)**	-3.262 (0.550)**	-0.110 (0.429)	-0.057 (0.435)
Pupil Value-added	-0.840 (0.096)**	-0.823 (0.099)**	-0.831 (0.100)**	-0.785 (0.107)**
School of choice	-0.068 (0.013)**	--	-0.031 (0.012)**	--
School chosen for good grades	-0.071 (0.007)**	-0.076 (0.007)**	-0.004 (0.008)	-0.005 (0.008)
Chosen for little bullying	-0.027 (0.009)**	-0.027 (0.009)**	-0.021 (0.013)	-0.020 (0.013)
Controls + other choice dummies	Yes	Yes	Yes	Yes

Evidence on school choice: discussion...

- Being at school of choice significantly correlated with higher satisfaction and less bullying for parents
 - Much less significant for children...
- Findings reinforce impression that parents value academic performance
 - See effect of being in a school chosen because of high performance
- Being in school chosen for high test-scores *also* linked to 'happier' pupils
 - How to interpret? Cognitive dissonance/ex-post assessment of choice or...
 - High-flying schools 'make' pupils happier? Value-added of these schools not much higher than performance of schools chosen for other reasons...
- Interestingly, choosing school because of little bullying associated with higher satisfaction
 - However bullying not strongly linked to test-based quality measures

School performance, perceptions and house prices

Reg. coeffs (std.err.)	<u>No controls</u>	<u>School controls</u>	<u>Schools + Area controls</u>	<u>Schools + Area controls + VA</u>
------------------------	--------------------	------------------------	--------------------------------	-------------------------------------

Panel A: Perceptions reported by Pupils

Fraction: Pupil Unhappy	-0661 (0.246)**	-0.413 (0.194)*	-0.164 (0.100)\$	-0.105 (0.100)
School Value-added				0.036 (0.008)**
Fraction: Pupil Bullied	-0.251 (0.186)	-0.219 (0.146)	-0.163 (0.072)*	-0.110 (0.072)
School Value-added				0.035 (0.008)**

Panel B: Perceptions reported by Parents

Fraction: Not Satisfied	-0.460 (0.148)**	-0.311 (0.120)**	-0.069 (0.065)	0.036 (0.065)
School Value-added				0.039 (0.009)**
Fraction: Pupil Bullied	-0.836 (0.211)**	-0.301 (0.183)\$	-0.174 (0.082)*	-0.133 (0.079)\$
School Value-added				0.036 (0.008)**

Some remarks on house price evidence...

- Hard to disentangle effects of different subjective assessments on prices
 - Few observations and variables quite correlated at school level
- Some evidence that parental satisfaction is linked to house prices
 - *Unconditionally* on value-added: this carries most relevant information
 - Pupil happiness also correlated with higher house prices: independent effect or correlated with parental satisfaction? Hard to say...
- Interestingly, levels of bullying have an effect on housing costs
 - Even including school value-added, marginally significant coeffs.
 - Consistent with findings that schools with little bullying are valued by parents and their children alike and...
 - Levels of bullying is a different dimension of school 'quality', not strongly related to grades

Conclusion: our results in a nutshell...

- Parental satisfaction is strongly related to test-based school quality measures
- At the same time, school average test scores not related to measures capturing pupils' enjoyment of their schools
- Further, some evidence of house prices 'capitalization' of these 'soft' measures of school quality
 - But mainly *unconditionally* on standard test-based school rankings
- This suggests that school quality as measured by test scores tends to dominate parental perception of educational quality
 - Plays prominent role in school and residential choice
- Yet 'quality' along these dimensions does not have any beneficial effect on pupil enjoyment of the learning environment

Full set of Tables for the presentation “Assessing School Quality: Academic Standards, Pupil Wellbeing and Parental Satisfaction”.

Table 1: Descriptive statistics; Main variables

Variable	Mean/Fraction	Std.Dev.	N. of Observations
<i>Panel A: Pupils' Perceptions</i>			
Pupil Happy when at School?	1.849	0.684	12989
<i>Strongly Agree (value 1)</i>	<i>0.294</i>	--	3823
<i>Agree (value 2)</i>	<i>0.589</i>	--	7653
<i>Disagree (value 3)</i>	<i>0.090</i>	--	1164
<i>Strongly Disagree (value 4)</i>	<i>0.027</i>	--	349
Pupil Unhappy when at School; Binary	0.116	0.321	12989
Pupil Getting Bored at School; Binary	0.420	0.494	12605
Pupil Dislikes Teachers; Binary	0.136	0.342	13272
Pupil Bullied when at School: Threatened; Binary	0.193	0.394	13060
<i>Panel B: Parents' Perceptions</i>			
Parents' Rating of School Quality?	1.776	0.800	13572
<i>Very Good (value 1)</i>	<i>0.400</i>	--	5431
<i>Fairly Good (value 2)</i>	<i>0.472</i>	--	6404
<i>Neither Good nor Bad (value 3)</i>	<i>0.089</i>	--	1209
<i>Fairly Bad (value 4)</i>	<i>0.030</i>	--	405
<i>Vary Bad (value 5)</i>	<i>0.009</i>	--	123
Parent Not Satisfied with School; Binary	0.128	0.334	13572
Parent reports Little Progress in School, Binary	0.099	0.299	13572
Parent thinks Teachers Not Interested in Pupil; Binary	0.142	0.350	13572
Bullying, reported by Parent: Threatened; Binary	0.129	0.335	12273
<i>Panel C: Pupil KS2 Points and School Scores</i>			
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
Pupil KS3-KS2 Value Added	6.811	3.645	13030
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	4.988	1.264	13762

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. “Pupil Unhappy when at School; Binary” is coded from the variable “Pupils Happy when at School?”. “Parent Not Satisfied with School; Binary” is coded from the variable “Parents' Rating of School Quality?”.

Table 2-a: Cross-correlations and factor analysis; pupils' perception

<i>Panel A: Cross-Correlations</i>	Pupil Unhappy	Pupil Getting Bored	Pupil Dislikes Teachers	Pupil Bullied: Threatened
Pupil Unhappy at School	1.000			
Pupil Getting Bored at School	0.261*	1.000		
Pupil Dislikes Teachers	0.295*	0.296*	1.000	
Pupil Bullied at School: Threatened	0.148*	0.095*	0.053*	1.000

<i>Panel B: Loadings from Factor Analysis (Factor 1 only)</i>	<i>Loading</i>	<i>Key Statistics for Factor 1:</i>
Pupil Unhappy at School	0.493	Eigenvalue: 0.743
Pupil Getting Bored at School	0.469	Difference: 0.732
Pupil Dislikes Teachers	0.489	Proportion: 1.759
Pupil Bullied at School: Threatened	0.201	Cumulative: 1.759

Note: All variables are binary indicators (see Table 1). * - correlation significant at the 1% level. Factor analysis on 12075 pupils. Factor 2 eigenvalue: 0.011; proportion: 0.027. Factor 3 eigenvalue: -0.139; proportion: -0.330. Factor 4 eigenvalue: -0.192; proportion: -0.455.

Table 2-b: Cross-correlations and factor analysis; parents' perception

<i>Panel A: Cross-Correlations</i>	Parent Not Satisfied	Little Progress	Teachers Not Interested	Bullying: Threatened
Parent Not Satisfied with School	1.000			
Parent reports Little Progress in School	0.353*	1.000		
Parent thinks Teachers Not Interested	0.361*	0.331*	1.000	
Bullying, reported by Parent: Threatened	0.136*	0.129*	0.112*	1.000

<i>Panel B: Loadings from Factor Analysis (Factor 1 only)</i>	<i>Loading</i>	<i>Key Statistics for Factor 1:</i>
Parent Not Satisfied with School	0.567	Eigenvalue: 0.9484
Parent reports Little Progress in School	0.535	Difference: 0.9701
Parent thinks Teachers Not Interested	0.539	Proportion: 1.5914
Bullying, reported by Parent: Threatened	0.225	Cumulative: 1.5914

Note: All variables are binary indicators (see Table 1). * - correlation significant at the 1% level. Factor analysis on 12273 pupils. Factor 2 eigenvalue: -0.022; proportion: -0.036. Factor 3 eigenvalue: -0.150; proportion: -0.252. Factor 4 eigenvalue: -0.180; proportion: -0.303.

Table 3: Pupil enjoyment and attitudes towards the learning environment, and school average value-added

	<i>Pupil Unhappy at School</i>			<i>Pupil Getting Bored at School</i>			<i>Pupil Dislikes Teachers</i>			<i>Pupil Bullied at School: Threatened</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
School KS3 Point Score (x100)	-0.190 (0.303)	-0.117 (0.341)		-0.223 (0.522)	-0.451 (0.564)		-0.303 (0.354)	-0.629 (0.402)		-0.633 (0.429)	-1.029 (0.489)*	
School KS2 Point Score (x100)	1.092 (0.499)*	0.285 (0.508)		2.579 (0.865)**	0.898 (0.878)		1.039 (0.601)	1.171 (0.637)		1.504 (0.753)*	-0.381 (0.793)	
Pupil KS3 Point Score (x100)	-1.140 (0.091)**	-0.881 (0.096)**		-2.173 (0.136)**	-1.762 (0.141)**		-1.177 (0.093)**	-0.977 (0.097)**		-0.479 (0.109)**	-0.355 (0.118)**	
Pupil KS2 Point Score (x100)	0.587 (0.137)**	0.426 (0.142)**		1.579 (0.216)**	1.144 (0.217)**		0.989 (0.140)**	0.858 (0.142)**		0.162 (0.159)	0.029 (0.163)	
School Value Added (x100)			-0.097 (0.346)			-0.269 (0.552)			-0.517 (0.389)			-1.246 (0.475)**
Pupil Value Added (x100)			-0.961 (0.094)**			-1.878 (0.139)**			-1.001 (0.096)**			-0.408 (0.119)**
Pupil + School + Family + Census controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
N. of Observations	12261	10972	10972	11894	10647	10647	12527	11202	11202	12332	11039	11039
N. of Schools	598	588	588	599	590	590	598	588	588	600	590	590

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 area characteristics refer to the Output Area of pupil's residence.

Table 4: Parental satisfaction and attitudes towards the learning environment, and school average value-added

	<i>Parent Not Satisfied with School</i>			<i>Little Progress in School</i>			<i>Teachers Not Interested</i>			<i>Parent Reports Bullying: Threat</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
School KS3 Point Score (x100)	-2.637 (0.463)**	-3.712 (0.560)**		-0.977 (0.342)**	-1.651 (0.378)**		-1.184 (0.393)**	-1.927 (0.481)**		-0.193 (0.382)	-0.116 (0.424)	
School KS2 Point Score (x100)	0.915 (0.794)	0.425 (0.830)		1.489 (0.563)**	1.179 (0.557)*		1.087 (0.650)	0.983 (0.699)		0.492 (0.668)	-0.809 (0.694)	
Pupil KS3 Point Score (x100)	-0.921 (0.097)**	-0.838 (0.101)**		-1.497 (0.088)**	-1.271 (0.093)**		-1.240 (0.094)**	-1.068 (0.104)**		-0.858 (0.094)**	-0.703 (0.100)**	
Pupil KS2 Point Score (x100)	0.665 (0.143)**	0.527 (0.146)**		0.670 (0.126)**	0.508 (0.130)**		0.732 (0.140)**	0.685 (0.151)**		0.027 (0.141)	-0.085 (0.145)	
School Value Added (x100)			-4.293 (0.567)**			-1.717 (0.373)**			-2.092 (0.473)**			-0.237 (0.425)
Pupil Value Added (x100)			-0.880 (0.099)**			-1.404 (0.092)**			-1.132 (0.103)**			-0.847 (0.100)**
Pupil + School + Family + Census controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
N. of Observations	12780	11234	11234	12780	11234	11234	12780	11234	11234	11649	10299	10299
N. of Schools	600	590	590	600	590	590	600	590	590	595	586	586

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 area characteristics refer to the Output Area of pupil's residence.

Table 5: Pupil enjoyment and attitudes towards the learning environment, and school choice

	<i>Pupil Unhappy at School</i>		<i>Pupil Bullied at School: Threatened</i>	
	All Pupils	Pupils at School of Choice	All Pupils	Pupils at School of Choice
	(1)	(2)	(3)	(4)
School Value Added (x100)	0.089 (0.335)	0.301 (0.374)	-1.210 (0.482)*	-1.115 (0.534)*
Pupil Value Added (x100)	-0.953 (0.094)**	-0.939 (0.102)**	-0.374 (0.119)**	-0.471 (0.128)**
School of Choice	-0.025 (0.011)*	--	-0.019 (0.014)	--
School of Choice x Good Performance	-0.023 (0.007)**	-0.022 (0.007)**	-0.004 (0.009)	-0.004 (0.009)
School of Choice x Little Bullying	-0.027 (0.011)*	-0.027 (0.012)*	-0.034 (0.017)*	-0.033 (0.016)*
All controls	Yes	Yes	Yes	Yes
Other school choice dummies	Yes	Yes	Yes	Yes
N. of Observations	10891	9470	10956	9532
N. of Schools	587	573	588	574

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". None of these dummies had sizeable and significant effects in any of the specifications.

Table 6: Parental satisfaction and attitudes towards the learning environment, and school choice

	<i>Parent Not Satisfied with School</i>		<i>Parent Reports Bullying: Threat</i>	
	All Pupils	Pupils at School of Choice	All Pupils	Pupils at School of Choice
	(1)	(2)	(3)	(4)
School Value Added (x100)	-3.676 (0.543)**	-3.262 (0.550)**	-0.110 (0.429)	-0.057 (0.435)
Pupil Value Added (x100)	-0.840 (0.096)**	-0.823 (0.099)**	-0.831 (0.100)**	-0.785 (0.107)**
School of Choice	-0.068 (0.013)**	--	-0.031 (0.012)**	--
School of Choice x Good Performance	-0.071 (0.007)**	-0.076 (0.007)**	-0.004 (0.008)	-0.005 (0.008)
School of Choice x Little Bullying	-0.027 (0.009)**	-0.027 (0.009)**	-0.021 (0.013)	-0.020 (0.013)
All controls	Yes	Yes	Yes	Yes
Other school choice dummies	Yes	Yes	Yes	Yes
N. of Observations	11151	9698	10228	8906
N. of Schools	588	574	584	571

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". None of these dummies had sizeable and significant effects in any of the specifications.

Table 8: School perceptions, school performance and local house prices

	(1)	(2)	(3)	(4)
<i>Panel A: Pupil Unhappy at School</i>				
Fraction of Pupils Unhappy	-0.661 (0.246)**	-0.413 (0.194)*	-0.164 (0.100) ^S	-0.105 (0.100)
School KS2-KS3 Value Added				0.036 (0.008)**
<i>Panel B: Pupil Bullied at School: Threatened</i>				
Fraction of Pupils Bullied: Threat	-0.251 (0.186)	-0.219 (0.146)	-0.163 (0.072)*	-0.110 (0.072)
School KS2-KS3 Value Added				0.035 (0.008)**
<i>Panel C: Parent Not Satisfied with School</i>				
Fraction of Parents not Satisfied	-0.460 (0.148)**	-0.311 (0.120)**	-0.069 (0.065)	0.036 (0.065)
School KS2-KS3 Value Added				0.039 (0.009)**
<i>Panel D: Bullying, reported by Parent: Threatened</i>				
Fraction of Parents Reporting Bullying: Threat	-0.836 (0.211)**	-0.301 (0.183) ^S	-0.174 (0.082)*	-0.133 (0.079) ^S
School KS2-KS3 Value Added				0.036 (0.008)**
School controls	No	Yes	Yes	Yes
Catchment Area controls (Census + Housing markets)	No	No	Yes	Yes
Number of Observations	558	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; ^S - 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 A7.

Appendix: Additional Tables

TableA1: Control variables, descriptive statistics

Variable	Mean/Fraction	Std.Dev.	N. of Observations
<i>Panel A: Pupil Characteristics</i>			
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
<i>Panel B: School Characteristics</i>			
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
<i>Panel C: Family Background</i>			
Pupil is in a single parent family	0.260	0.439	13693
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

(TableA1, continued: Control variables, descriptive statistics)

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
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	0.004	0.067	12655
Pupil relation with mother: Does not see mother	0.001	0.027	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
<i>Panel D: Census OA Information</i>			
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.

Table A2-a: Patterns of correlation between pupils' and parents' perceptions

	Corresponding Parental Perception
Pupil Unhappy when at School; Binary	0.135*
Pupil Getting Bored at School; Binary	0.142*
Pupil Dislikes Teachers; Binary	0.130*
Pupil Bullied when at School: Threatened; Binary	0.341*

Note: The table reports correlation between pupils' outcomes (in Column 1) and corresponding parental perceptions. For "Pupil Unhappy when at School; Binary" the corresponding parental variable is "Parent Not Satisfied with School; Binary". For "Pupil Getting Bored at School; Binary" the corresponding parental variable is "Parent reports Little Progress at School; Binary". For "Pupil Dislikes Teachers; Binary" the corresponding parental variable is "Parent thinks Teachers Not Interested in Pupil; Binary". * - correlation significant at the 1% level.

Table A2-b: Correlation between pupils' and parents' perceptions and school test-scores

	School KS3 Point Score	School KS2-KS3 Value Added
<i>Panel A: Pupils' Perceptions</i>		
Pupil Unhappy when at School; Binary	-0.028*	-0.038*
Pupil Getting Bored at School; Binary	-0.002	-0.024*
Pupil Dislikes Teachers; Binary	-0.023*	-0.035*
Pupil Bullied when at School: Threatened; Binary	-0.016	-0.024*
<i>Panel B: Parents' Perceptions</i>		
Parent Not Satisfied with School; Binary	-0.187**	-0.177*
Parent reports Little Progress at School; Binary	-0.103*	-0.108*
Parent thinks Teachers Not Interested in Pupil; Binary	-0.091*	-0.092*
Bullying, reported by Parent: Threatened; Binary	-0.055*	-0.052*

Note: * - correlation significant at the 1% level.

Table A3: School choice, descriptive information

Variable	Mean/ Fraction	School KS2-KS3 Value Added	N. of Observations
Pupil at School of Choice?	0.861	5.072	13234
Reason for Choosing School (for pupils at school of choice):			
<i>Local School</i>	0.509	5.071	11397
<i>Pupil's Friends Attend the School</i>	0.301	5.069	11397
<i>School is Easy to Reach</i>	0.398	4.982	11397
<i>School has Good Performance Table Results</i>	0.368	5.573	11397
<i>School has Little Bullying</i>	0.057	5.495	11397
<i>School Chosen on Religious Grounds</i>	0.078	5.610	11397
<i>Pupil's Sibling(s) Attend(ed) the School</i>	0.360	5.060	11397
<i>Pupil's Parents or Relatives Attended the School</i>	0.144	4.974	11397

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.

Table A4: Correlation patterns, reason for choosing a school

	Local School	Friends Attend Schools	Easy to Reach	Good Results	Little Bullying	Chosen on Religious Grounds	Sibling(s) Attend(ed) School	Parents/Relatives Attended
Local school	1.000							
Friends Attend Schools	0.118*	1.000						
Easy to Reach	0.289*	0.197*	1.000					
Good Performance Table Results	-0.054*	0.038*	0.021	1.000				
Little Bullying	0.001	0.062*	0.038*	0.193*	1.000			
Chosen on Religious Grounds	-0.154*	-0.062*	-0.107*	0.107*	0.050	1.000		
Sibling(s) Attend(ed) School	-0.068*	-0.021	-0.009	-0.033*	0.009	-0.017	1.000	
Parents/relatives Attended School	0.017	0.034*	0.016	-0.027*	0.029*	0.010	-0.008	1.000

Note: * - correlation significant at the 1% level.

Table A5: School choice, pupil characteristics and family background

	Pupil at School of Choice	Good Performance Table Results	Little Bullying
	(1)	(2)	(3)
Pupil KS2 average point score (x100)	-0.116 (0.085)	1.255 (0.130)**	1.272 (0.058)*
Pupil eligible for Free School Meals (FSM)	-0.005 (0.010)	-0.047 (0.014)**	-0.004 (0.006)
Pupil is in a single parent family	-0.018 (0.008)*	-0.019 (0.012)	0.012 (0.006)*
Asian ethnicity	-0.058 (0.028)*	0.017 (0.034)	-0.030 (0.014)*
Black ethnicity	-0.155 (0.022)**	0.037 (0.027)	-0.028 (0.010)**
Chinese ethnicity	-0.160 (0.095)	0.181 (0.129)	0.003 (0.066)
Other and mixed ethnicities	-0.051 (0.016)**	0.043 (0.024)	0.014 (0.011)
Missing ethnicity	0.023 (0.017)	-0.005 (0.047)	0.004 (0.015)
Pupil religious affiliation: Christian	0.019 (0.007)**	0.051 (0.013)**	0.003 (0.006)
Pupil religious affiliation: Other	-0.017 (0.027)	0.022 (0.036)	-0.013 (0.015)
Pupil religious affiliation: Muslim	0.037 (0.026)	-0.014 (0.035)	-0.008 (0.014)
Main parent's edu.: HE, below degree	-0.019 (0.013)	-0.004 (0.019)	-0.013 (0.011)
Main parent's edu.: GCE, A-lev. or equiv.	-0.007 (0.012)	-0.021 (0.020)	-0.007 (0.011)
Main parent's edu.: A-C GCSE or equiv.	-0.013 (0.011)	-0.038 (0.017)*	-0.020 (0.010)*
Main parent's edu.: Other qualifications	-0.006 (0.014)	-0.061 (0.022)**	-0.029 (0.012)*
Main parent's edu.: No qualification	0.006 (0.013)	-0.117 (0.019)**	-0.032 (0.010)**
Number of older siblings: 1	0.038 (0.007)**	-0.044 (0.011)**	-0.002 (0.006)
Number of older siblings: 2	0.037 (0.009)**	-0.078 (0.014)**	-0.008 (0.007)
Number of older siblings: 3	0.052 (0.014)**	-0.055 (0.020)**	0.015 (0.010)
Number of older siblings: 4	0.059 (0.021)**	-0.075 (0.030)**	-0.002 (0.013)
Number of older siblings: 5 or more	0.07 (0.020)**	-0.132 (0.025)**	-0.010 (0.011)
Other controls + Census characteristics	Yes	Yes	Yes
Number of Observations	11994	10410	10410
Number of Schools	598	582	582

Note: The dependent variable in column (1) is a binary indicator for pupils attending the school of choice. The dependent variable in column (2) is a binary indicator for the school being chosen because of good grades. The dependent variable in column (3) is a binary indicator for the school being chosen because of little bullying. Standard Errors clustered at the Secondary school level in round brackets. ** - 1% significance; * - 5% significance. Other controls include: "Native language English" and "Pupil has disabilities" (not significant in the regressions). Excluded dummy categories are: White ethnicity; Pupil religious affiliation: None; Main parent's education: Degree or equivalent; Number of older siblings: 0. Census characteristics described in Appendix Table A1.

Table A6: Determinants of pupil and parental attitudes towards the learning environment

	<i>Pupil Unhappy at School</i>	<i>Pupil Bullied at School: Threatened</i>	<i>Parent Not Satisfied</i>	<i>Parent Reports Bullying: Threat</i>
	(1)	(2)		
Native language English	0.004 (0.014)	-0.012 (0.016)	0.029 (0.017)	0.009 (0.013)
Pupil eligible for Free School Meals (FSM)	0.017 (0.010)	0.030 (0.012)*	-0.008 (0.011)	0.041 (0.011)**
Male	0.026 (0.007)**	0.054 (0.009)**	-0.001 (0.006)	0.005 (0.007)
Pupil has disabilities	0.008 (0.009)	0.056 (0.012)**	0.021 (0.010)*	0.076 (0.011)**
Asian ethnicity	-0.028 (0.018)	-0.078 (0.024)**	-0.025 (0.023)	-0.069 (0.020)**
Black ethnicity	-0.021 (0.015)	-0.055 (0.018)**	0.000 (0.016)	-0.075 (0.015)**
Chinese ethnicity	0.063 (0.077)	-0.153 (0.052)**	-0.036 (0.052)	-0.107 (0.020)**
Other and mixed ethnicities	0.005 (0.015)	-0.051 (0.016)**	0.021 (0.015)	-0.012 (0.015)
Missing ethnicity	-0.004 (0.019)	-0.044 (0.022)*	0.033 (0.025)	0.006 (0.022)
Number of pupils at school (x100)	-0.002 (0.003)	-0.003 (0.004)	0.007 (0.005)	-0.003 (0.003)
Number of qualified teachers (x100)	0.003 (0.053)	0.036 (0.065)	-0.123 (0.077)	0.046 (0.056)
Fraction of pupils eligible for FSM (x100)	-0.100 (0.038)**	-0.111 (0.051)*	-0.066 (0.052)	-0.018 (0.048)
Fraction of Whites in school (x100)	-0.634 (0.455)	-0.664 (0.546)	0.545 (0.489)	0.254 (0.626)
Fraction of other/mixed ethnicity (x100)	-0.526 (0.470)	-0.600 (0.552)	0.589 (0.509)	0.233 (0.643)
Fraction of Blacks in school (x100)	-0.641 (0.467)	-0.713 (0.553)	0.672 (0.501)	0.239 (0.629)
Fraction of Asian in school (x100)	-0.597 (0.453)	-0.615 (0.541)	0.561 (0.486)	0.293 (0.624)
Schools is a: Voluntary Aided School	0.004 (0.013)	-0.002 (0.015)	-0.044 (0.013)**	-0.007 (0.014)
School is a: Voluntary Controlled School	-0.048 (0.011)**	-0.044 (0.026)	-0.024 (0.014)	0.019 (0.020)
School is a: Foundation School	0.001 (0.009)	-0.016 (0.011)	0.008 (0.014)	-0.005 (0.011)
School is a: City Technology College	-0.023 (0.035)	-0.055 (0.032)	-0.014 (0.027)	-0.032 (0.038)
Pupil out with friends, past 7 days: 1-2 times	-0.013 (0.008)	-0.010 (0.010)	-0.007 (0.008)	-0.028 (0.009)**
Pupil out with friends, past 7 days: 3-5 times	-0.003 (0.009)	-0.001 (0.011)	0.004 (0.009)	-0.020 (0.010)*
Pupil out with friends, past 7 days: 6-more times	0.022 (0.011)*	-0.005 (0.013)	0.013 (0.010)	-0.008 (0.011)
Pupil does sport: More than once a week	0.011 (0.007)	0.023 (0.010)*	-0.010 (0.008)	0.006 (0.008)
Pupil does sport: Once a week	0.016 (0.009)	0.036 (0.012)**	-0.008 (0.009)	0.017 (0.010)
Pupil does sport: Less than once a week	0.026 (0.014)	0.073 (0.017)**	-0.011 (0.013)	0.030 (0.015)*
Pupil does sport activities: Hardly ever	0.045 (0.014)**	0.038 (0.017)*	0.014 (0.013)	0.043 (0.015)**
Pupil does sport activities: Never	0.089 (0.015)**	0.040 (0.017)*	0.029 (0.014)*	0.034 (0.017)*
Pupil religious affiliation: Christian	-0.020 (0.007)**	0.000 (0.010)	-0.010 (0.008)	-0.011 (0.008)
Pupil religious affiliation: Other	-0.034 (0.018)	0.001 (0.026)	0.036 (0.024)	0.010 (0.023)
Pupil religious affiliation: Muslim	-0.047 (0.018)**	-0.034 (0.023)	0.015 (0.024)	-0.031 (0.022)
Pupil is in a single parent family	0.016 (0.008)*	0.009 (0.010)	0.019 (0.008)*	0.005 (0.008)
Pupil relation with mother: Fairly good	0.054 (0.007)**	0.035 (0.008)**	0.012 (0.007)	0.012 (0.007)
Pupil relation with mother: Fairly bad	0.183 (0.031)**	0.173 (0.034)**	0.029 (0.025)	0.068 (0.028)*
Pupil relation with mother: Very bad	0.315 (0.071)**	0.149 (0.065)*	0.040 (0.054)	0.023 (0.055)
Pupil relation with mother: Does not see mother	0.215 (0.153)	-0.179 (0.017)**	-0.101 (0.035)**	-0.113 (0.022)**
Main parent's education: HE, below degree	-0.005 (0.012)	-0.012 (0.016)	-0.001 (0.013)	0.016 (0.012)
Main parent's education: GCE, A level or equiv.	-0.010 (0.012)	0.009 (0.016)	-0.022 (0.012)	0.009 (0.013)
Main parent's education: GCSE A-C or equiv.	-0.007 (0.011)	-0.009 (0.014)	-0.031 (0.010)**	-0.016 (0.011)
Main parent's education: Other qualifications	-0.007 (0.013)	0.004 (0.017)	-0.019 (0.013)	0.003 (0.014)
Main parent's education: No qualification	-0.025 (0.012)*	-0.030 (0.015)*	-0.040 (0.012)**	-0.041 (0.012)**
Number of older siblings: 1	0.011 (0.008)	0.012 (0.010)	0.019 (0.008)*	-0.004 (0.008)
Number of older siblings: 2	0.027 (0.010)*	-0.000 (0.012)	0.037 (0.010)**	-0.007 (0.010)
Number of older siblings: 3	0.022 (0.014)	0.018 (0.018)	0.016 (0.015)	-0.001 (0.016)
Number of older siblings: 4	0.024 (0.020)	0.015 (0.024)	0.040 (0.022)	0.012 (0.027)
Number of older siblings: 5 or more	0.065 (0.024)**	-0.004 (0.023)	0.039 (0.025)	0.023 (0.027)
Pupil Value Added + School Value Added + School choice variables	Yes	Yes	Yes	Yes
Census characteristics	Yes	Yes	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 (1) of Table 5. Column (2) reports additional coefficients from the regression in Column (3) of Table 5. Column (3) reports additional coefficients from the regression in Column (1) of Table 6. Column (4) reports additional coefficients from the regression in Column (3) of Table 6. ** - 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. Census characteristics described in Appendix Table A1; regression coefficients not reported.

TableA7: Descriptive statistics of variables for the housing costs analysis - school level analysis

Variable	Mean/Fraction	Std.Dev.	N. of Obs.
<i>Panel A: Main Variables</i>			
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
<i>Panel B: School controls</i>			
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
<i>Panel D: Catchment area controls (Census + Housing markets)</i>			
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.