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Test scores, subjective assessment and stereotyping of ethnic minorities

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Abstract

We assess whether ethnic minority pupils are subject to low teacher expectations. We exploit the English testing system of "quasi-blind" externally marked tests and "non-blind" internal assessment to compare differences in these assessment methods between White and ethnic minority pupils. We find evidence that some ethnic groups are systematically "under-assessed" relative to their White peers, while some are "over-assessed". We propose a stereotype model in which a teacher's local experience of an ethnic group affects assessment of current pupils; this is supported by the data.

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Table 1: Summary statistics for the difference between Teacher Assessment (TA) and Key Stage Test level (KS); TA-KS

	TA-KS, English			TA-KS, Maths			TA-KS, Science		
KS	Mean	SD	% N	Mean	SD	% N	Mean	SD	% N
3	0.12	0.50	15.95	0.18	0.51	19.41	0.14	0.55	9.75
4	-0.03	0.49	50.52	0.01	0.43	45.27	-0.06	0.49	45.59
5	-0.29	0.48	27.29	-0.18	0.42	29.52	-0.32	0.50	42.22

	English	Maths	Science
TA-KS	%	%	%
-1	15.04	9.80	19.70
0	71.23	75.99	71.86
1	9.35	10.25	6.49

Note. The sample was taken from academic years 2001/2002 to 2004/2005, and includes only those with both TA and KS results. SD stands for Standard Deviation, TA for Teacher Assessment; KS for Key Stage Test. TA-KS is the difference between TA and KS, measured in levels. The top panel shows summary statistics for TA-KS at different levels of KS, by subject. The bottom panel shows the proportion of students with a difference between TA and KS of -1, 0, or 1, by subject.

Table 2: Teacher Assessment (TA) relative to the Key Stage Test (KS), given that the pupil achieved level 4 in the Key Stage Test, by subject

	English (%)			Maths (%)			Science (%)		
Variable	TA<KS	TA=KS	TA>KS	TA<KS	TA=KS	TA>KS	TA<KS	TA=KS	TA>KS
Ethnic Group									
White	12.4	77.5	10.2	7.9	82.5	9.6	13.6	78.2	8.3
Black Caribbean	17.2	75.2	7.5	10.2	81.3	8.5	17.3	76.0	6.7
Black African	18.3	74.3	7.4	10.6	81.0	8.4	16.9	75.7	7.4
Indian	13.8	76.3	10.0	8.4	80.5	11.1	13.8	76.4	9.9
Pakistani	20.2	73.6	6.2	11.9	80.3	7.8	19.2	74.2	6.6
Bangladeshi	18.1	75.2	6.7	11.2	81.0	7.8	16.5	75.8	7.7
Chinese	13.3	76.0	10.7	6.0	81.1	12.9	10.6	76.1	13.3
Special Educational Needs (SEN)									
No SEN	9.6	79.2	11.2	6.0	83.3	10.7	8.7	81.1	10.2
SEN, without statement	32.9	65.0	2.1	19.3	77.5	3.3	29.2	68.6	2.2
SEN, with statement	33.6	62.7	3.8	22.2	73.2	4.5	39.6	58.0	2.4
Free School Meals (FSM)									
No FSM	11.8	77.5	10.6	7.5	82.4	10.1	12.5	78.5	8.9
FSM	19.1	75.1	5.8	11.9	81.5	6.6	20.2	74.7	5.1
English as an additional language (EAL)									
Not EAL	12.5	77.4	10.1	7.9	82.5	9.6	13.7	78.1	8.2
EAL	18.1	74.4	7.5	10.6	80.6	8.8	17.2	75.0	7.8
Male	14.3	76.5	9.1	9.0	81.7	9.3	15.1	76.5	8.4
Female	11.6	77.8	10.6	7.4	82.8	9.7	12.9	79.1	8.0

Note. The sample was taken from academic years 2001/2002 to 2004/2005, and includes only those with both TA and KS results. Cells give the proportion of the group with TA<KS, TA=KS and TA>KS, given that students achieved level 4 in the Key Stage test in the subject. Level 4 is the expected level of attainment at KS2 (DCSF). TA stands for Teacher Assessment; KS for Key Stage Test.

Table 3: The probability that TA<KS in English. The dependent variable is binary, equal to one if TA<KS.

Variable	Specification 1 *b*	t stat	Specification 2 *b*	t stat	Specification 3 *b*	t stat	Specification 4 *b*	t stat	Raw mean % TA<KS
KS2 score	0.066	171.65	0.105	190.13	0.108	192.03	0.110	199.10	
Ethnic Group									
Black Caribbean	0.040	12.87	0.027	8.68	0.027	9.52	0.025	11.39	0.172
Black African	0.048	14.56	0.019	5.87	0.018	6.41	0.017	7.15	0.178
Black Other	0.035	8.53	0.016	3.99	0.014	3.53	0.012	3.36	0.173
Indian	0.017	4.81	-0.006	1.65	-0.018	5.35	-0.018	7.61	0.171
Pakistani	0.059	15.46	0.027	6.47	0.015	3.70	0.010	3.66	0.181
Bangladeshi	0.046	8.95	0.004	0.84	-0.001	0.21	0.002	0.71	0.178
Other Asian ethnicity	0.044	9.36	0.028	5.87	0.019	4.17	0.017	4.22	0.186
Chinese	0.007	1.45	-0.015	3.00	-0.017	3.49	-0.019	4.15	0.171
Mixed White and Black Caribbean	0.028	9.03	0.020	6.52	0.013	4.51	0.013	4.65	0.173
Mixed White and Black African	0.013	2.21	0.004	0.77	0.003	0.59	0.004	0.74	0.162
Mixed White and Asian	-0.011	2.85	-0.014	3.64	-0.018	4.71	-0.015	4.19	0.150
Mixed Other	0.013	3.99	0.003	1.02	0.000	0.01	-0.001	0.29	0.168
Other	0.044	14.77	0.020	6.82	0.018	6.34	0.017	6.63	0.179
Missing	0.013	4.67	0.008	2.99	0.007	2.68	0.007	3.02	0.157
Reference group: White									0.150
Other personal characteristics?	No		Yes		Yes		Yes		
School characteristics?	No		No		Yes		No		
LA fixed effects?	No		No		Yes		No		
School fixed effects?	No		No		No		Yes		
R^2	0.044		0.071		0.078		0.074		
Number of Observations	2255382		2255382		2227352		2255382		
Number of Schools	16550		16550		15719		16550		

Note. The sample was taken from academic years 2001/2002 to 2004/2005, and includes only those with both TA and KS results. OLS regressions were run with standard errors clustered by school. See Appendix Table 3 for full results. Specification 1 includes Key Stage Test level and a set of ethnicity dummies only. Specification 2 also controls for observable pupil characteristics such as whether they have free school meals (an indicator for poverty status). Specification 3 also includes school characteristics, such as faith school status, and LA fixed effects. Specification 4 includes school fixed effects in place of school characteristics and LA fixed effects. Full details of all specifications are given in Appendix Table 2.

Table 6: Hypothesis tests to help interpretation of differences between groups.

Test	Subject	Ethnic group	Controls	Sample	F stat	P value	Reject?
Equality of subject effects by ethnicity	English, Maths	All	Full set of pupil controls	Full sample, as in main regressions	189.2	0.00	Y
	English, Science	All	Full set of pupil controls	Full sample, as in main regressions	113.29	0.00	Y
	Maths, Science	All	Full set of pupil controls	Full sample, as in main regressions	120.2	0.00	Y
Equality of effects within ethnic group, across schools	English only	Black Caribbean	Full set of pupil controls	Pupils in all school years with at least 5 Black Caribbean pupils	3791.92	0.00	Y
		Black African	Full set of pupil controls	Pupils in all school years with at least 5 Black African pupils	4624.73	0.00	Y
		Indian	Full set of pupil controls	Pupils in all school years with at least 5 Indian pupils	11122.7	0.00	Y
		Pakistani	Full set of pupil controls	Pupils in all school years with at least 5 Pakistani pupils	7018.47	0.00	Y
Pupil fixed effects	All	All	Pupil fixed effects Interaction between subject*ethnic group and subject*gender	Full sample, as in main regressions	678.03	0.00	Y

Notes: 1) The first panel reports results for the test of equality of subject effects by ethnicity. Does ethnicity have the same effect on p(TA<KS) across subjects? Results were computed pairwise due to size limitations of the model. All ethnic groups were included in the model, with a full set of pupil controls (as in specification 2 in Appendix Table 2). The F statistic reports the value of the F test for whether coefficients for ethnicity are equal. In each pairwise combination the hypothesis that coefficients across subjects are equal is rejected.

2) The second panel reports results for tests of equality in P(TA<KS) within ethnic group, between schools. These tests were completed separately for each ethnic group, with a full set of pupil controls. We restrict the sample to white students and students of the ethnic group in question, in school years where there are at least 5 students of the ethnic group. In each case, we reject the null hypothesis that the effect of the respective group is the same across schools.

3) The third panel reports results for a test of equality between subject, within pupil. Looking at differences in P(TA<KS) between subject for each pupil removes any pupil specific effects on TA and KS such as classroom behaviour. We allow coefficients to vary by subject and ethnicity, and by subject and gender. We reject the null hypothesis that interaction terms for subject and ethnic group are zero.

Table 7: Statistical discrimination: The impact of local (school level) performance of your own group in the previous year on the probability that TA<KS.
The dependent variable is binary and equal to one if TA<KS

	English				Maths				Science			
	No *t*-1		*t*-1		No *t*-1		*t*-1		No *t*-1		*t*-1	
Variable	*b*	t stat	*b*	t stat	*b*	t stat	*b*	t stat	*b*	t stat	*b*	t stat
KS2 score	0.108	178.88	0.108	178.99	0.069	155.23	0.069	155.22	0.162	192.68	0.162	192.77
Ethnic Group												
Black Caribbean	0.033	10.94	0.029	9.75	0.015	6.29	0.012	5.04	0.035	11.03	0.031	9.71
Black African	0.022	6.86	0.019	6.18	0.003	1.28	0.002	0.65	0.018	5.44	0.013	3.92
Indian	-0.009	3.00	-0.003	0.90	-0.020	7.68	-0.018	6.61	-0.029	8.65	-0.028	8.30
Pakistani	0.015	4.55	0.013	3.83	0.003	1.16	0.002	0.59	0.007	1.82	0.000	0.09
Bangladeshi	0.007	1.60	0.008	1.77	-0.004	1.04	-0.004	1.17	-0.008	1.56	-0.012	2.33
Chinese	-0.032	3.87	-0.024	2.94	-0.059	9.55	-0.054	8.58	-0.084	9.83	-0.080	9.31
School mean by group (t-1)			*-0.031*	*20.02*			*-0.011*	*8.85*			*-0.026*	*12.60*
Pupil level characteristics	Yes				Yes				Yes			
School level fixed effects	Yes				Yes				Yes			
R^2	0.073		0.073		0.045		0.045		0.096		0.096	
Number of Observations	1545838		1545838		1545838		1545838		1545838		1545838	

Note. The sample was taken from academic years 2001/2002 to 2004/2005, and includes only those with both TA and KS results. The local (school level) mean is the mean KS2 score in the previous academic year, for your specific ethnic group. The column headed 't-1' gives coefficients for the regression in which the local mean score of the group in the previous year is included. The regression is otherwise the same as in specification 4 in tables 3, 4, and 5. The column headed 'No t-1' does not include the local mean score in the previous year, and therefore has an identical specification to that in tables 3, 4, and 5. The coefficients here vary slightly from tables 3, 4, and 5, as the sample for the regression is restricted to be the same as in regression including t-1.

Table 8: Statistical Discrimination: The impact of local (school level) performance of your own group in the previous year on the probability that TA<KS.
Is the impact the same where ethnic group is in the minority/majority in the school? The dependent variable is binary and equal to one if TA<KS, for English only.

	No *t*-1		*t*-1, full sample		*t*-1, white majority		*t*-1, white minority	
Variable	*b*	t stat	*b*	t stat	*b*	t stat	*b*	t stat
KS2 score	0.108	178.88	0.108	178.99	0.110	170.18	0.095	60.61
Ethnic Group								
Black Caribbean	0.033	10.94	0.029	9.75	0.029	5.90	0.029	7.19
Black African	0.022	6.86	0.019	6.18	0.018	3.33	0.020	4.95
Indian	-0.009	3.00	-0.003	0.90	-0.007	1.76	-0.006	1.20
Pakistani	0.015	4.55	0.013	3.83	0.017	3.40	0.009	1.89
Bangladeshi	0.007	1.60	0.008	1.77	0.008	1.04	0.006	0.99
Chinese	-0.032	3.87	-0.024	2.94	-0.026	2.60	-0.024	1.67
School mean by group (t-1)			*-0.031*	*20.02*	*-0.037*	*18.23*	*-0.017*	*6.96*
Pupil level characteristics	Yes		Yes		Yes		Yes	
School level fixed effects	Yes		Yes		Yes		Yes	
R^2	0.073		0.073		0.073		0.076	
Number of Observations	1545838		1545838		1387902		148426	

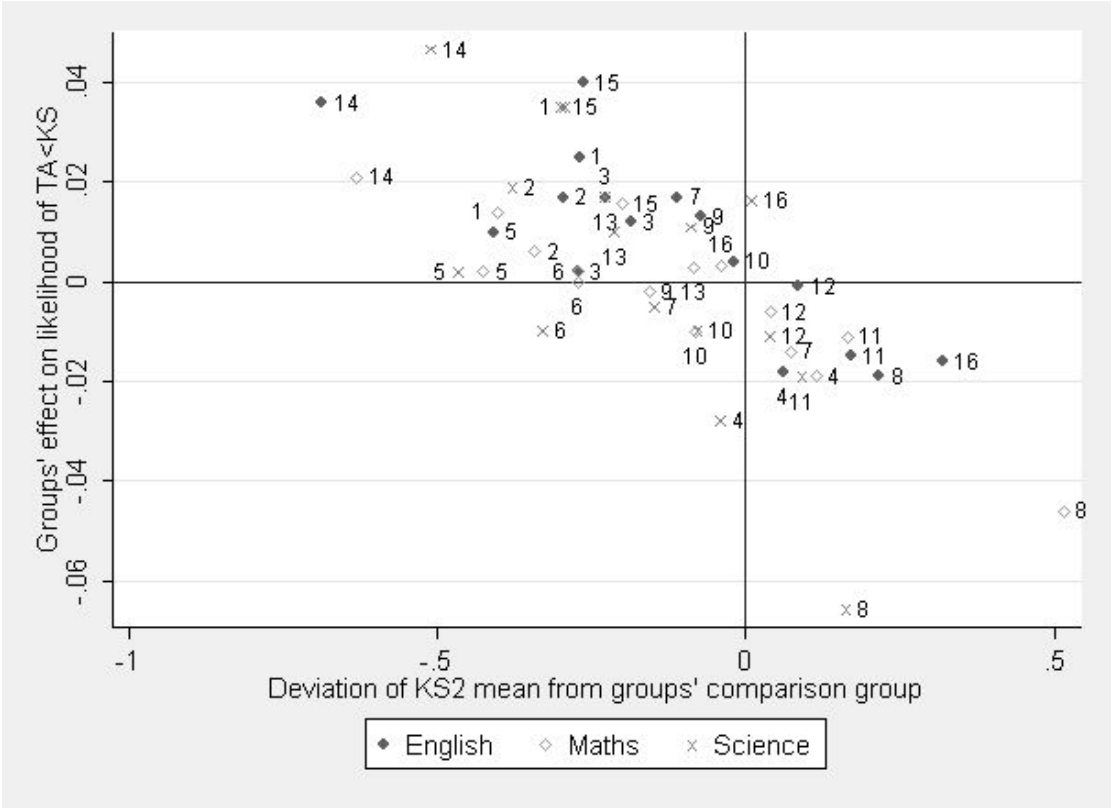
Note. The sample was taken from academic years 2001/2002 to 2004/2005, and includes only those with both TA and KS results. The local (school level) mean is the mean KS2 score in the previous academic year, for your specific ethnic group. Column 1 gives the coefficients for ethnicity variables in the regression where no past school mean is included. Column 2 gives the coefficients for ethnicity variables, including the ethnic group specific past school mean KS2 English score, on the full sample. The specification in column 3 is the same as in column 2, this time on the sample of school cohorts where white students are in the majority (more than half of the relevant student cohort). Column 4 is the same regression, this time on the sample of school cohorts where white students are in the minority (less than half of the relevant student cohort). In column 4 the majority is 'all other' ethnic groups.

Table 9: The correlation of attitudes towards school and ethnicity. Each dependent variable is binary.

	Independent Dummy Variables for Ethnicity										
	Black Caribbean		Black African		Indian		Pakistani		Bangladeshi		
Dependent Variable:	*b*	t stat	*b*	t stat	*b*	t stat	*b*	t stat	*b*	t stat	R^2
Believe school is a waste of time	-0.027	2.39	-0.046	3.26	-0.042	6.52	-0.045	5.51	-0.056	6.35	0.032
In trouble in more than 1/2 classes	-0.004	0.19	-0.019	0.80	-0.069	5.88	-0.066	4.26	-0.054	2.60	0.027
Parents report often quarrel	-0.062	2.53	-0.123	4.42	-0.141	8.71	-0.227	13.89	-0.329	23.48	0.013
Student has been suspended	0.078	3.52	-0.028	1.32	-0.067	8.59	-0.103	11.37	-0.136	13.14	0.052
Student has been expelled	0.011	1.04	-0.002	0.56	-0.004	2.81	-0.005	2.24	-0.007	4.60	0.006
Completes 4/5 nights of homework	0.026	1.18	0.235	8.24	0.203	10.59	0.152	8.01	0.171	7.64	0.043
Like school	0.035	1.37	0.145	5.04	0.127	6.99	0.162	8.49	0.185	7.57	0.009

Note. The sample was taken from the Longitudinal Survey of Young People in England (LSYPE), wave 1, when students are 13-14. All dependent variables are binary, and each row represents a diffe each regression is 12378. The columns show the coefficients for ethnic group dummies in relation to White students. Survey weights are applied to the regressions. Robust standard errors are also appl

Figure 1: The correlation of relative group performance in KS2 tests and the likelihood of having TA<KS.



Number	Group
Comparison group – White pupils	
1	Black Caribbean
2	Black African
3	Black Other
4	Indian
5	Pakistani
6	Bangladeshi
7	Other Asian ethnicity
8	Chinese
9	Mixed White and Black Caribbean
10	Mixed White and Black African
11	Mixed White and Asian
12	Mixed Other
13	Other
Comparison group – pupils without FSM	
14	Free School Meals (FSM)
Comparison group – pupils without EAL	
15	English as Additional Language (EAL)
Comparison group – male pupils	
16	Female

Note. Mean KS2 scores for each group in each subject were calculated using the full sample used in regressions. This sample uses data from 2001/2002 to 2004/2005, for all pupils with both TA and KS scores. The groups' effect on the likelihood of TA<KS was taken from regression coefficients in specification 4 (including school fixed effects) in tables 3, 4, 5. 'Relative' group performance was calculated as the mean of the group in question, minus the mean of the appropriate reference group, for example non-FSM pupils for FSM pupils.

Appendix Table 1: Summary statistics for important variables

Variable	Mean	KS2 SD	N
TA English	3.911	0.88	2255382
TA Maths	3.978	0.89	2255382
TA Science	4.119	0.80	2255382
KS English	3.883	1.14	2255382
KS Maths	3.896	1.13	2255382
KS Science	4.236	0.90	2255382
Binary Variables			
White	0.841	0.37	1896966
Black Caribbean	0.015	0.12	32902
Black African	0.016	0.13	36834
Black Other	0.005	0.07	10930
Indian	0.022	0.15	48732
Pakistani	0.026	0.16	59501
Bangladeshi	0.010	0.10	22328
Other Asian ethnicity	0.004	0.07	10116
Chinese	0.003	0.06	7009
Mixed White and Black Caribbean	0.008	0.09	17536
Mixed White and Black African	0.002	0.04	4287
Mixed White and Asian	0.004	0.06	9294
Mixed Other	0.007	0.09	16590
Other Ethnic Group	0.012	0.11	26255
No Special Educational Needs	0.776	0.42	1751106
Special Educational Needs, no statement	0.195	0.40	438731
Special Educational Needs, with statement	0.029	0.17	65463
No Free School Meals	0.830	0.38	1871184
Free School Meals	0.170	0.38	384030
English as first language	0.905	0.29	2040477
English as Additional Language	0.095	0.29	214016
Male	0.509	0.50	1147608
Female	0.491	0.50	1107774

Note. The sample was taken from academic years 2001/2002 to 2004/2005, and includes only those with both TA and KS results. SD stands for Standard Deviation. TA stands for Teacher Assessment, KS for Key Stage Test. The expected level of attainment at KS2 is level 4