



BIPE Project

Social and ethnic biases in primary education



# ETHNIC BIASES in ENGLISH STATE PRIMARY SCHOOLS

Exploring the impact of school ethnic composition on teachers' biased perceptions of students' school effort

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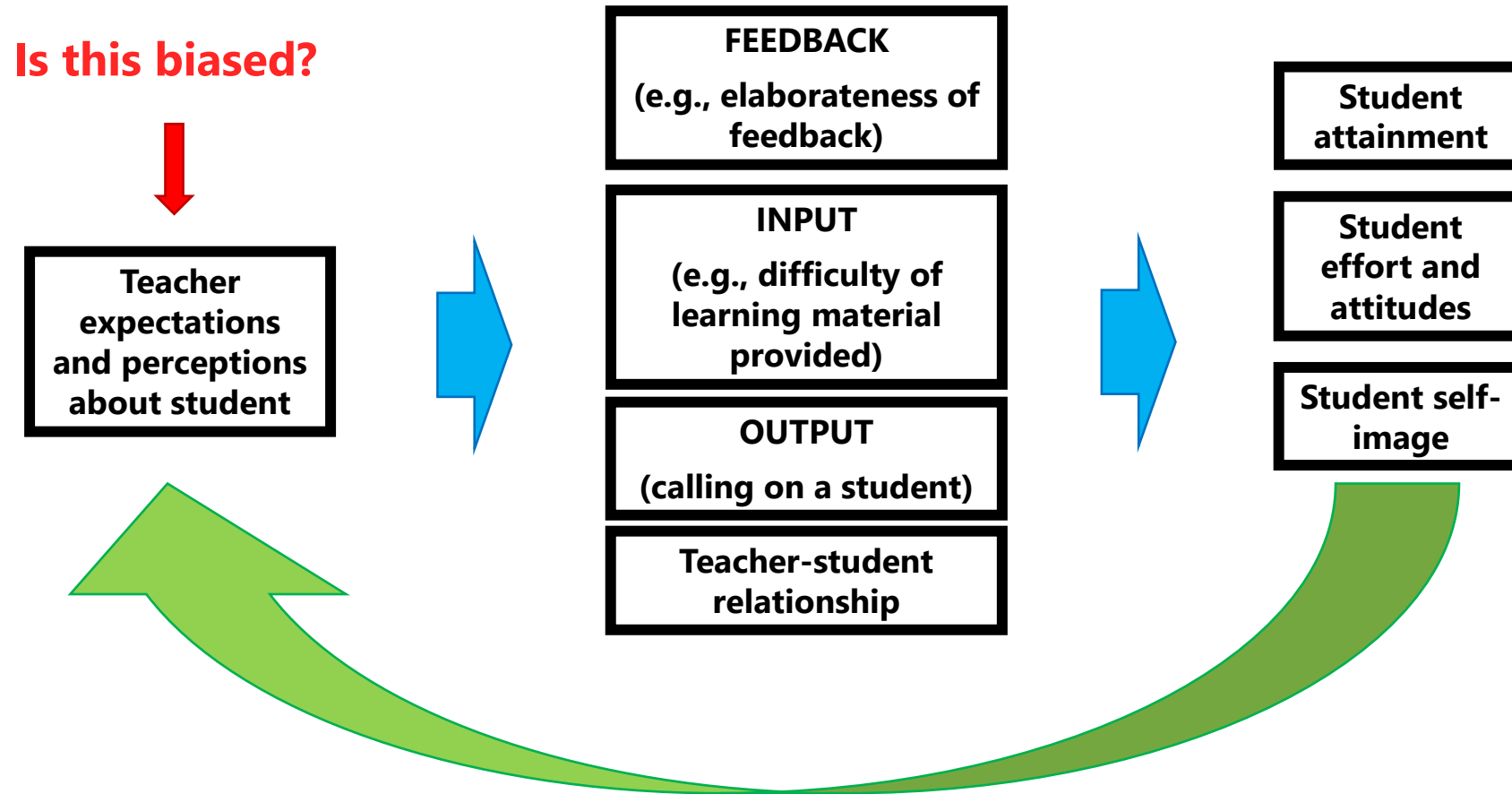
Katherin Barg

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# MOTIVATION

# Self-fulfilling prophecies and feedback loops

Theoretical framework of self-fulfilling prophecies and feedback loops



# **THEORETICAL CONSIDERATIONS**

# TEACHER BIAS & ETHNICITY

There is a fair amount of research on teacher bias & student ethnicity but:

- most focuses on inaccurate teacher assessment of students' performance & abilities
- most from other countries (US, Canada, other European countries)
- many reduce ethnicity to majority/minority, white vs other, migration background vs. native etc.

*See: Meissel et al. (2017); Turner, Rubie-Davies & Webber (2015); Tobisch & Dresel, (2017); Kaiser, Südkamp & Möller (2017); Glock & Krolak-Schwerdt (2014); Holder & Kessels (2017)*

**SO, this research fits in the understudied intersection of TEACHER ETHNIC BIASED PERCEPTIONS of STUDENTS' ACADEMIC ATTITUDES in England.**

Why are academic attitudes (and SCHOOL EFFORT in particular) important?

- Assessments of student motivation and engagement are used by teachers (alongside assessments of students' academic achievement) to grade, place students in within-class ability groups, or advise students & families on school transitions and school tracks placement


*See: Brookhart et al. (2016); Baeriswyl et al. (2011); Baumert et al. (2019); Pit-ten Cate et al. (2016); Vanlommel & Schildkamp (2019)*

- Learning motivation and interest affect student achievement

*See: Richardson et al (2012); Givvin et al (2011); Praetorius & Südkamp (2019); Harvey, Suizzo & Jackson (2016)*

- Unrecognised effort is linked to lower self-concept & school enjoyment

*See: Francis et al. (2017)*



# SCHOOL ETHNIC COMPOSITION

How does school ethnic composition relate to teacher bias?

➤ **Allport INTERCULTURAL CONTACT HYPOTHESIS**

high-quality contact with members of an outgroup can promote more positive out-group attitudes. The presence of a large proportion of students from the target group implies that the teacher has more contact and is more familiar with target group students.

*See: Allport (1954); Pettigrew & Tropp (2006)*

Why are we interested in the effect of the school ethnic composition?

- There is strong evidence for school SES composition effects on teacher bias  
*See: Brault, Janosz & Archambault (2014); Matsuoka (2014); Timmermans et al. (2015)*
- The empirical evidence on school ethnic composition effects on teacher bias is rather mixed (and focuses almost exclusively on teacher expectations and assessments or implicitly-held biases (ITAs))  
*See: Kumar, Karabenick & Burgoon (2015); Thys & van Houtte (2016); Yarnell & Bohrnstedt (2018); Kozlowski (2018); Agirdag, van Avermaet & van Houtte (2013); Glock & Böhmer (2018); Boone et al. (2018); McKown & Weinstein (2008)*
- The empirical evidence existing does not always investigate differential effects for students of different ethnicities

# **DATA, SAMPLE & METHODOLOGY**

# DATA & TIME PERIODS

	ENGLAND
<b>Data</b>	<u>Millennium Cohort Study (MCS)</u> & <u>MCS-linked National Pupil Database</u>
<b>Primary Sampling Unit (PSU)</b>	Electoral Wards
<b>Stratification</b>	(within UK countries) – ethnic, disadvantaged, advantaged
<b>Sample at wave 1</b>	18,552
<b>Birth Cohort</b>	2000-2001
<b>Period of observation in primary education</b>	2008/2012
<b>T1: early primary school</b>	MCS4: Y2, age 7
<b>T2: end of primary school</b>	MCS5: Y6, age 11



# SAMPLE CONSTRUCTION

	N
MCS wave 1 sample	18,552
MCS wave 1&2 sample (with 'new families')	19,243
Available under EUL	19,231
Productive at t2 (MCS5)	13,279
Residing in England at t2	8,670
<b>BASE SAMPLE</b>	<b>8,670</b>
Productive Teacher Survey at T2	6,224
Matching NPD record at T2	5,134
<b>TARGET SAMPLE</b>	<b>5,134</b>
Productive at t1 (MCS4)	5,134
Complete cases	4,792
<b>ANALYTICAL SAMPLE</b>	<b>4,792</b>

# VARIABLES

	time	VARIABLE USED
<b>Student own report of school effort</b>	<b>T2</b>	How often do you try your best at school? <i>[all of the time, most of the time, some of the time, never]</i>
<b>Teacher perception of (student's) school effort</b>	<b>T2</b>	How often does this child try their best at school? <i>[always, often, sometimes, never]</i>
<b>Child's gender</b>	<b>T2</b>	Male (ref.), Female
<b>Child's age</b>	<b>T2</b>	Age in years (2 decimals places)
<b>SES</b>	<b>T2</b>	Annual equivalised disposable income in £
<b>Prior ability (language skills)</b>	<b>T1</b>	BAS II Word Reading
<b>Prior ability (mathematical skills)</b>	<b>T1</b>	NFER Progress in Maths
<b>Prior ability (other cognitive skills)</b>	<b>T1</b>	BAS II Pattern Construction
<b>Child's ethnicity</b>	<b>T2</b>	(Parent-reported) ethnicity of the child, grouped as: <i>[White, Mixed, Indian, Pakistani, Bangladeshi, Black Caribbean, Black African, other ethnic group]</i>
<b>School ethnic composition (version 1)</b>	<b>T2</b>	Share of school body that is not categorised as White
<b>School ethnic composition (version 2)</b>	<b>T2</b>	Share of school body categorised as of the same ethnicity as the cohort member
<b>School size</b>	<b>T2</b>	N. of students enrolled in school
<b>School socio-economic composition</b>	<b>T2</b>	Share or student school body that is eligible for FSM (rounded to nearest 10)

# METHODOLOGY

## **STEP 1: ESTIMATE TEACHER BIAS**

Are teacher's perceptions of students' school effort in agreement with student own reports?

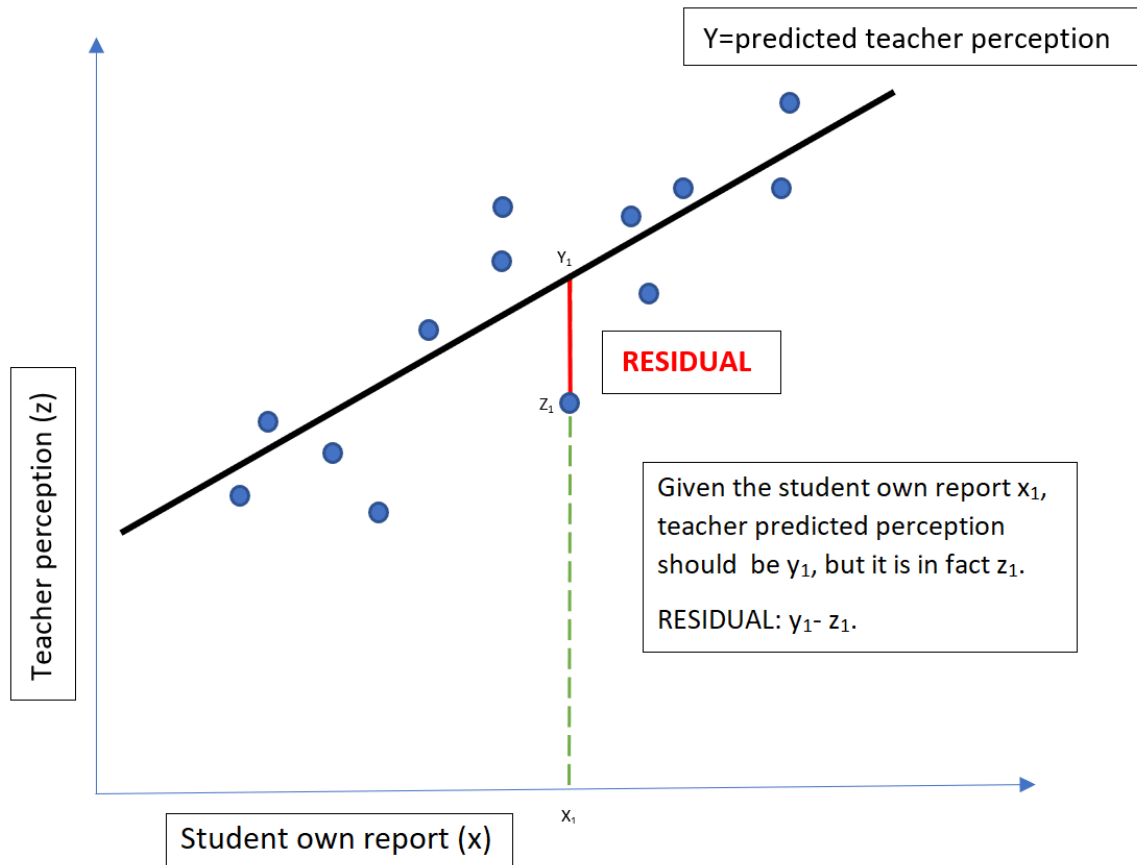
## **STEP 2: ANALYSIS I – student-level ethnic & socio-demographic predictors of TEACHER BIAS**

Do children from different ethnic groups face different teacher biases (even when controlling for socio-demographic factors and prior ability)?

## **STEP 3: ANALYSIS II – school-level ethnic & socio-demographic predictors of TEACHER BIAS**

- Does school ethnic composition affect teacher bias?
- Does the impact of school ethnic composition on teacher bias differ across ethnic groups?

# TEACHER BIAS: Residuals



## METHODOLOGY

1. Standardise teacher perception & student own report of school effort
2. OLS regression of teacher perceptions on student own report
3. Compute residuals
4. Standardise residuals



**POSITIVE** residuals = teacher overestimates student's effort

**NEGATIVE** residuals = teacher underestimates student's effort

# RESULTS

# DESCRIPTIVE STATISTICS

## Teacher perception & Student own report

		%
Teacher perception of SCHOOL EFFORT	<i>Always</i>	42.6
	<i>Usually</i>	42.5
	<i>Sometimes</i>	14.4
	<i>Never</i>	0.6
Student own report of SCHOOL EFFORT	<i>All of the time</i>	57.9
	<i>Most of the time</i>	38.0
	<i>Some of the time</i>	3.6
	<i>Never</i>	0.5

*weighted analytical sample N = 4,792*

## Student ethnicity

	%
White	82.3
Mixed	4.1
Indian	2.4
Pakistani	4.4
Bangladeshi	1.4
Black Caribbean	1.5
Black African	2.1
Other ethnic group	1.9

*weighted analytical sample N = 4,792*

### NOTE

Descriptive statistics of teacher perceptions & student own reports decomposed by ethnicity are reported in APPENDIX A

Descriptive statistics of student socio-demographic controls & prior ability are reported in APPENDIX B

Descriptive statistics of school-level information are reported in APPENDIX C



# DESCRIPTIVE STATISTICS

## Average ethnic composition of schools

		mean	SD
Average share of the school student body that is...	White	81.6	26.1
	Mixed	3.6	3.8
	Indian	2.8	6.9
	Pakistani	4.8	14.1
	Bangladeshi	1.6	7.2
	Black Caribbean	1.1	3.3
	Black African	3.4	7.4
	Other	3.1	5.7
	Unclassified	0.7	1.9

*weighted analytical sample N = 4,792*

# DESCRIPTIVE STATISTICS

## School ethnic composition INDICATOR 1

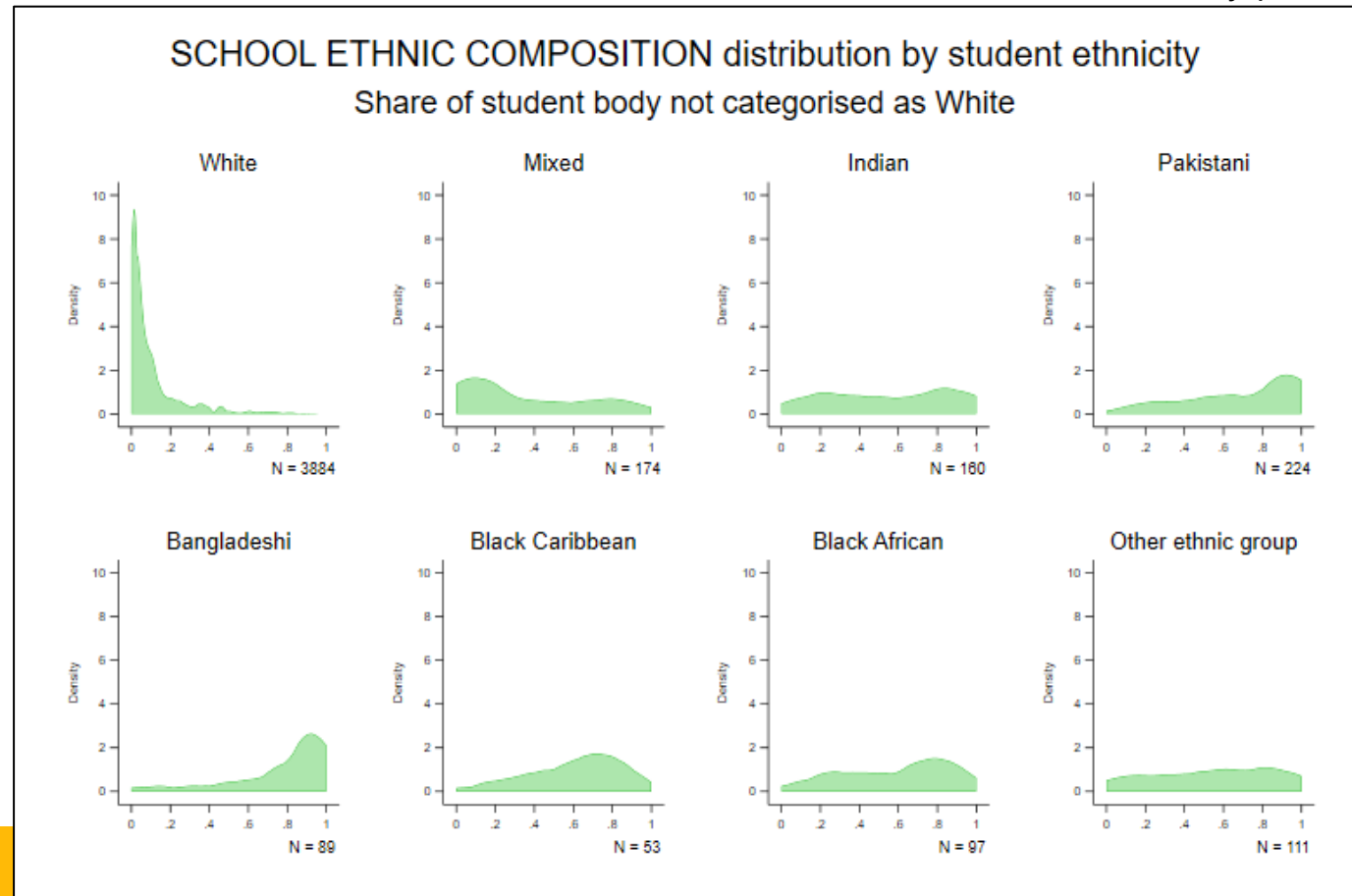
mean	SD
18.4	26.1

Share of school student body that is not categorised as White

Kernel density plots

		%	Cumulative %
Share of students attending schools ...	<i>Below 10%</i>	59.7	59.7
	<i>[10% - 20%)</i>	13.6	73.3
	<i>[20% - 30%)</i>	5.9	79.1
	<i>[30% - 40%)</i>	4.8	84.0
	<i>[40% - 50%)</i>	2.6	86.6
	<i>[50% - 60%)</i>	2.3	88.9
	<i>[60% - 70%)</i>	2.5	91.4
	<i>[70% - 80%)</i>	2.4	93.8
	<i>[80% - 90%)</i>	2.6	96.4
	<i>[90% - 100%]</i>	3.7	100

*weighted analytical sample N = 4,792*





# DESCRIPTIVE STATISTICS

## School ethnic composition INDICATOR 2

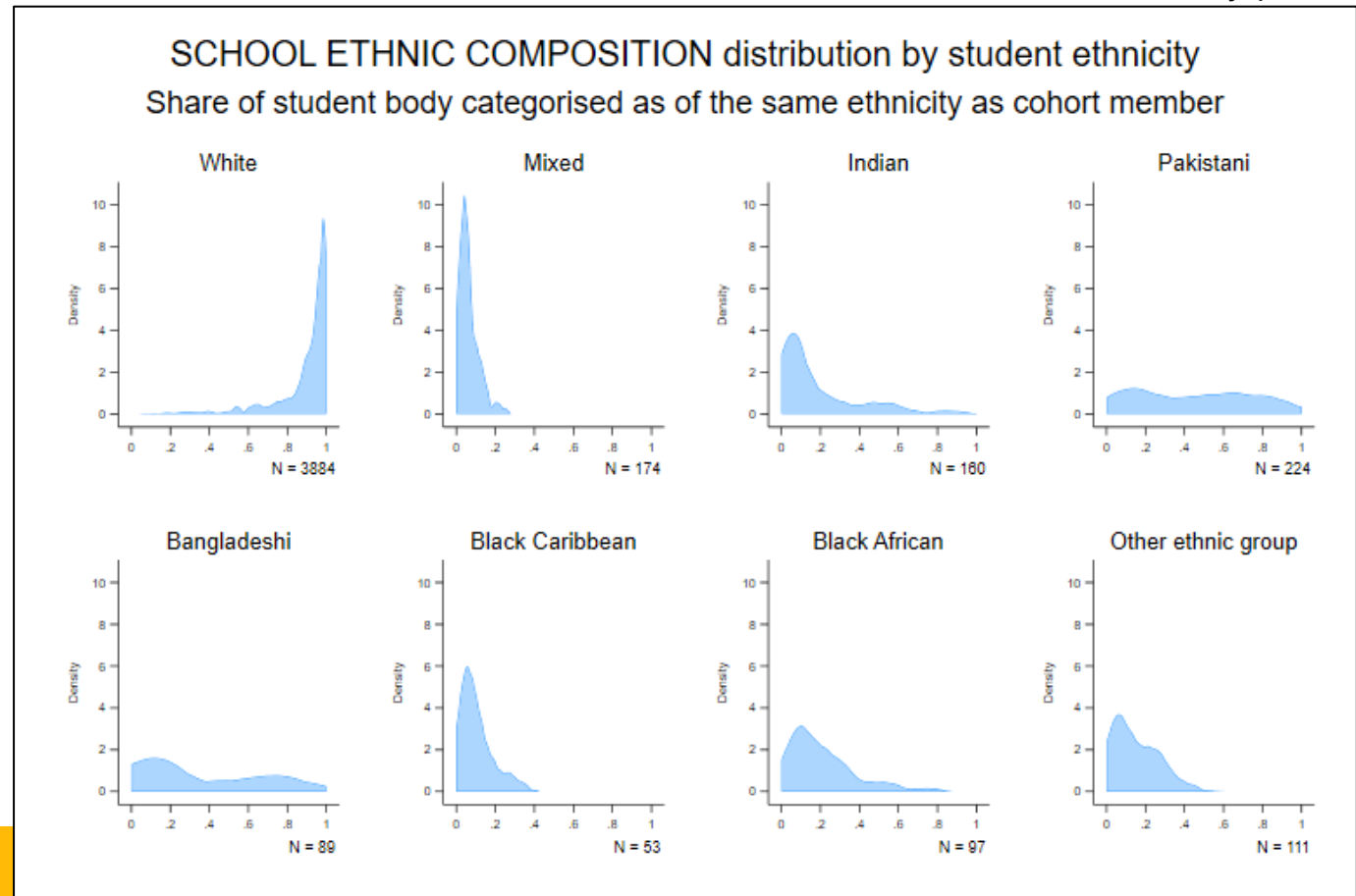
mean	SD
77.8	31.0

Share of school student body that is categorised as of the same ethnicity as cohort member

Kernel density plots

		%	Cumulative %
Share of students attending schools ...	<i>Below 10%</i>	8.3	8.3
	<i>[10% - 20%)</i>	3.6	12.0
	<i>[20% - 30%)</i>	2.6	14.5
	<i>[30% - 40%)</i>	1.6	16.1
	<i>[40% - 50%)</i>	1.4	17.5
	<i>[50% - 60%)</i>	2.6	20.1
	<i>[60% - 70%)</i>	4.1	24.2
	<i>[70% - 80%)</i>	5.5	29.7
	<i>[80% - 90%)</i>	12.2	41.9
	<i>[90% - 100%]</i>	58.2	100

*weighted analytical sample N = 4,792*



# ANALYSIS STEP 1

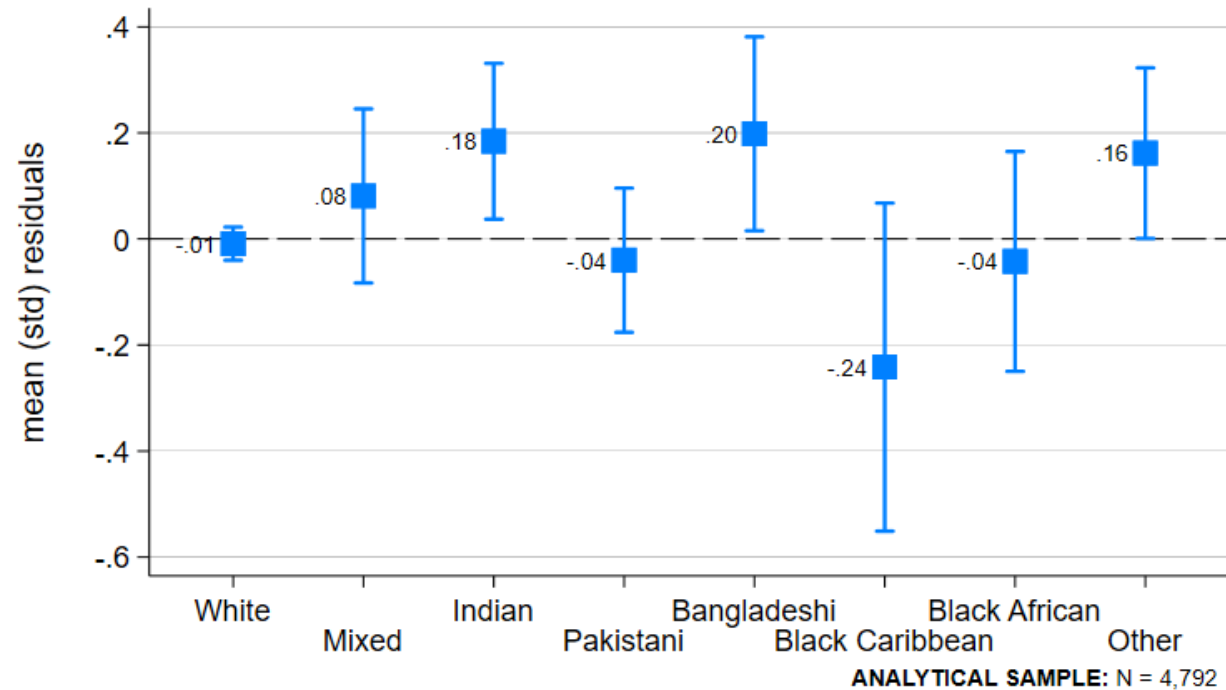
## ESTIMATING TEACHER BIAS

### Predicted (std) teacher perception of SCHOOL EFFORT

(std) Student own report of SCHOOL EFFORT	0.258 *** (0.019)
CONSTANT	~ ~
N° of Observations	4,792
R <sup>2</sup>	0.066

OLS regression model with standard errors clustered at the teacher level  
\* p < .05, \*\* p < .01, \*\*\* p < 0.001  
~ Coefficient & SE of the constant are suppressed for SDC.

Average TEACHER BIAS by student ethnicity  
SCHOOL EFFORT



# ANALYSIS STEP 2

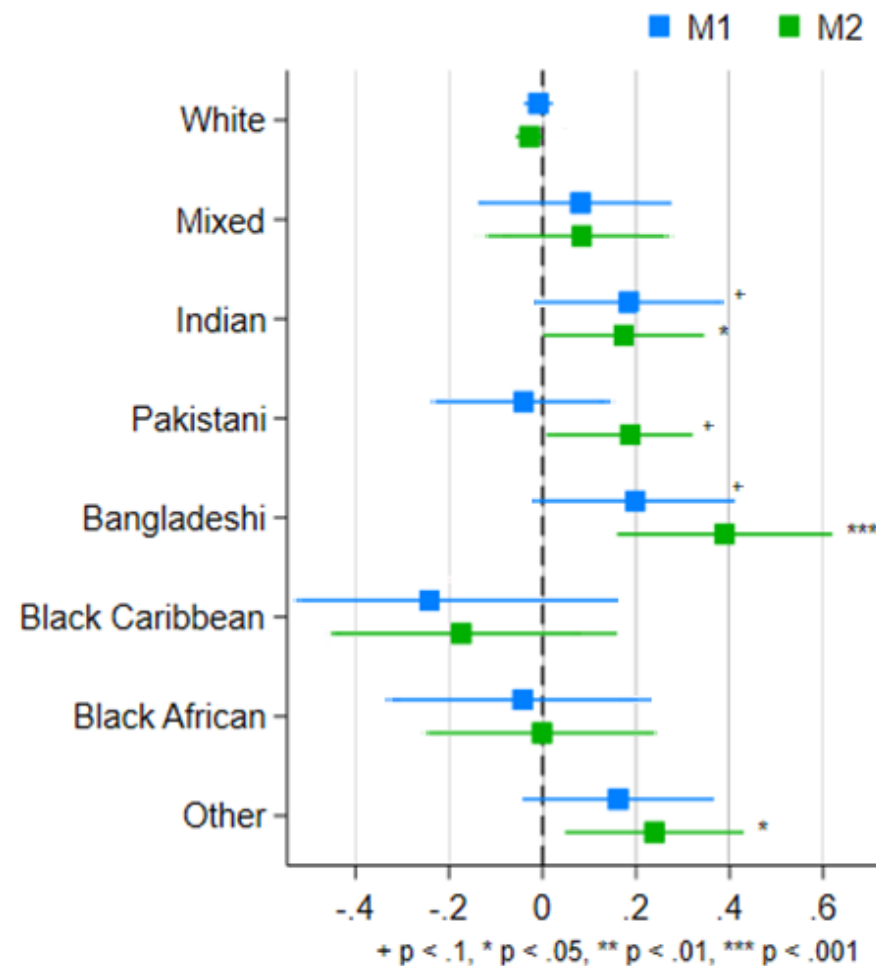
Do children from different ethnic groups face different teacher biases ?

## NOTE

Average linear predictions were computed for the OLS regressions reported in APPENDIX table D. The values here graphed are reported in APPENDIX table E.

Average linear prediction of TB by ethnicity

SCHOOL EFFORT



**M1** – raw model  
**M2** – with child-level controls (socio-demographic characteristics & prior ability)

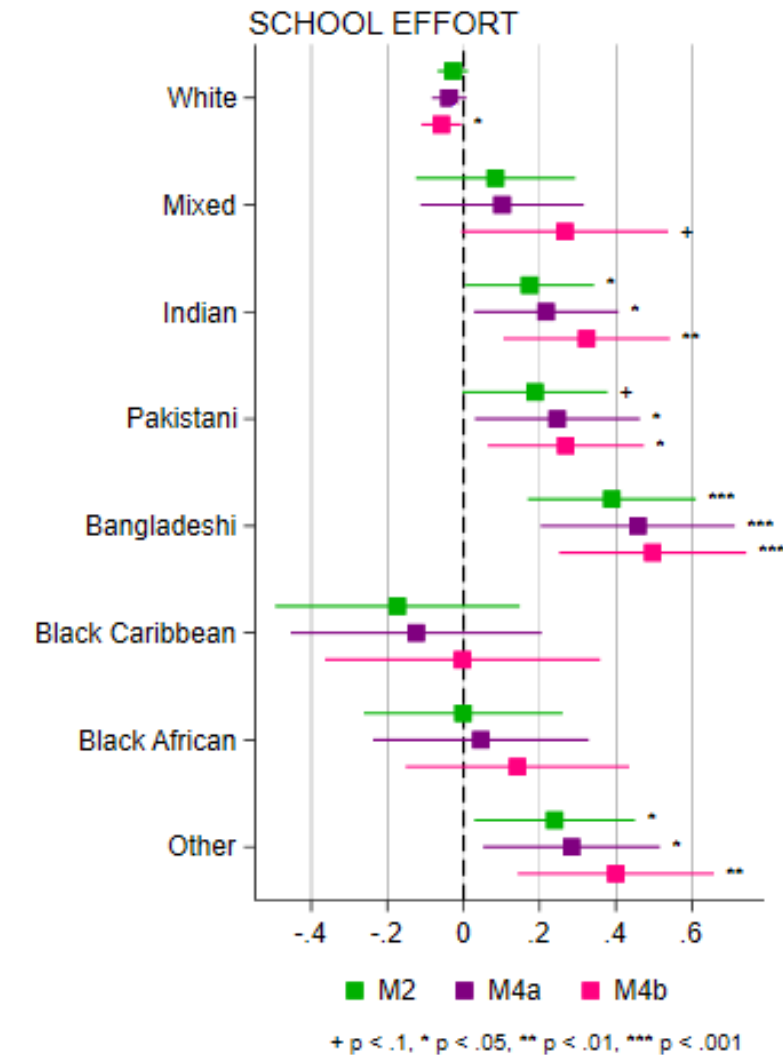
# ANALYSIS STEP 3a

**Does school ethnic composition affect teacher ethnic bias?**  
**(even when controlling for socio-demographic factors and prior ability & other school-level characteristics)**

	MODEL 3a	MODEL 3b	MODEL 4a	MODEL 4b
T2 - School ethnic composition (categorised not as White)	-0.123 (0.111)		-0.130 (0.116)	
T2 - School ethnic composition (same ethnicity as cohort member)		0.249* (0.123)		0.258* (0.125)
Child-level controls (ethnicity, socio-demographic characteristics & prior ability)	X	X	X	X
School-level controls (School SES composition & school size)			X	X
Constant	-2.908*** (0.626)	-3.205*** (0.621)	-2.873*** (0.638)	-3.164*** (0.638)
N° of Observations	4792	4792	4792	4792
R <sup>2</sup>	0.137	0.138	0.137	0.138

**NOTE**  
 Average linear predictions were computed for the OLS regressions reported in APPENDIX table F.  
 The values here graphed are reported in APPENDIX table G.

Average linear prediction of TB by ethnicity



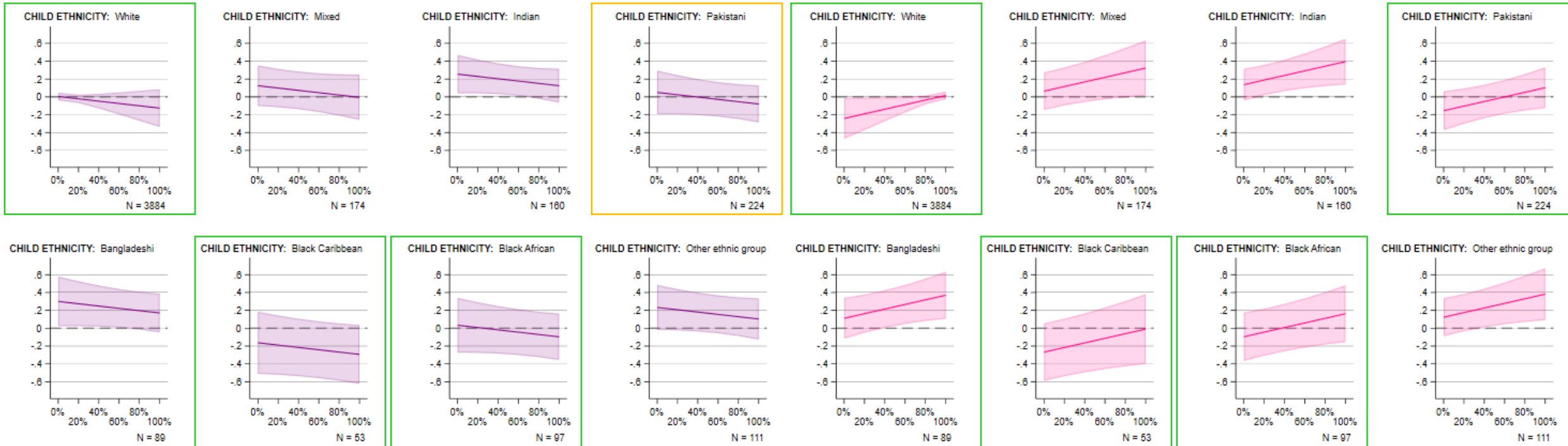
**M2** – with child-level controls (socio-demographic characteristics & prior ability)  
**M3a** – with school ethnic composition (v1)  
**M3b** – with school ethnic composition (v2)

# ANALYSIS STEP 3b

## Does the impact of school ethnic composition on differ across ethnic groups?

AVG LP of TEACHER BIAS across school ethnic composition, by ethnicity  
Share of student body not categorised as White

AVG LP of TEACHER BIAS across school ethnic composition, by ethnicity  
Share of student body categorised as of the same ethnicity as cohort member



# CONCLUSIONS

- **School ethnic segregation** (or at least marked differences in the school ethnic composition across cohort members' ethnicities) appear to be quite prevalent in state schools in England
- **Low degree of agreement** between cohort members' & teachers' assessments of SCHOOL EFFORT
- **Teacher biased perceptions of SCHOOL EFFORT are** (partially) **systematically associated with cohort members' ethnicity** (even when controlling for socio-demographic characteristics and prior ability): cohort members reported as *Indian, Pakistani, Bangladeshi,* and *Other* are overestimated in their school effort.
- We find **no significant school effects** when using as our measure of school ethnic composition **% OF MINORITY STUDENTS** - > in contrast with some existing empirical evidence like Glock & Böhrer (2018)
- We find **significant school effects** when using as our measure of school ethnic composition **% of SAME-ETHNICITY STUDENTS** -> in support of Alleport (1954) contact hypothesis
- How school effects affect cohort members of different ethnicities is a complicated matter that has to be investigated more deeply

# LIMITATIONS & POSSIBLE NEXT STEPS

## LIMITATIONS DUE TO SAMPLE & DATA CONSTRAINTS:

- The MCS includes ONLY children born in the UK
- The linked-NPD data allows us to include ONLY state schools in England
- We cannot control for urban/rural status of school or for GOR
- We don't have much teacher-level information (only age, gender, and qualification) and nothing that pertains teacher implicit or explicit beliefs/attitudes

## NEXT STEPS:

- Explore the issue of school segregation: how different are the school attended by cohort members of different ethnicities? How does it affect TB differently for cohort members of different ethnicities?
- Move beyond school effort: school enjoyment, classroom misbehaviour, academic self-concept, achievement, school engagement (broader definition)
- Investigate gender-specific patterns of TB for certain ethnicities (Black Caribbean boys?)
- Fine tune last model: teacher characteristics (age, gender, years of experience, **years of exposure**), other school characteristics



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**THANK YOU!**  
**Any question or thought?**

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**Project website: <https://bipeproject.blogs.bristol.ac.uk>**





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# APPENDIX

# APPENDIX A DESCRIPTIVE STATISTICS: Teacher perception & Student own report by ethnicity

		TOTAL	White	Mixed	Indian	Pakistani	Bangladeshi	Black Caribbean	Black African	Other ethnic group
Teacher perception of SCHOOL EFFORT	<i>Always</i>	<b>42.6</b>	41.9	49.7	49.4	42.6	46.4	39.2	42.1	48
	<i>Usually</i>	<b>42.5</b>	42.9	34.5	43.8	42.2	48	35.4	40.7	45.3
	<i>Sometimes</i>	<b>14.4</b>	14.7	≈15	≈5	≈15	< 5	≈20	≈20	< 5
	<i>Never</i>	<b>0.6</b>	0.5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Student own report of SCHOOL EFFORT	<i>All of the time</i>	<b>57.9</b>	57.4	55.5	62.7	64.8	56.8	58.5	58.6	62.8
	<i>Most of the time</i>	<b>38.0</b>	38.3	39.7	33.6	31.9	39.5	39.4	38.5	37.2
	<i>Some of the time</i>	<b>3.6</b>	3.7	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	<i>Never</i>	<b>0.5</b>	0.6	< 5	< 5	< 5	< 5	< 5	< 5	< 5

*weighted analytical sample N = 4,792*





# APPENDIX B

## DESCRIPTIVE STATISTICS: Student socio-demographic controls & prior ability

		mean ( or %)	SD
Gender	Male	50.7	-
	Female	49.3	-
Age at t2		11.15	0.34
Annual equivalized disposable income in £		369.00	195.00
BAS II Word Reading – t score		112.78	17.59
NFER PiM – t score		52.95	10.91
BAS II Pattern Construction – t score		98.27	15.57

*weighted analytical sample N = 4,792*

# APPENDIX C

## DESCRIPTIVE STATISTICS: School-level information

		mean (or %)	SD
School socio-economic composition (rounded to the nearest 10)	0	39.2	-
	10	29.1	-
	20	15.3	-
	30	9.0	-
	40	5.0	-
	50	1.7	-
	60	0.8	-
School size		296.13	191.33
School ethnic composition (alternative 1) Share of (student) school body that is not categorised as White		18.4	26.1
School ethnic composition (alternative 2) Share of (student) school body categorised as the same ethnicity as the student		77.8	31.0

*weighted analytical sample N = 4,792*



# APPENDIX D

## OLS regression models of TEACHER BIAS, M1 & M2

		M1	M2
ETHNICITY	<i>White</i>	0.000 (.)	0.000 (.)
	<i>Mixed</i>	0.090 (0.111)	0.112 (0.108)
	<i>Indian</i>	0.193+ (0.112)	0.202* (0.089)
	<i>Pakistani</i>	-0.031 (0.107)	0.216* (0.101)
	<i>Bangladeshi</i>	0.207+ (0.110)	0.417*** (0.116)
	<i>Black Caribbean</i>	-0.233 (0.199)	-0.145 (0.166)
	<i>Black African</i>	-0.034 (0.142)	0.027 (0.135)
	<i>Other ethnic group</i>	0.171 (0.104)	0.267** (0.110)
GENDER	Female ( <i>ref. male</i> )		0.505*** (0.034)
Age at time of TEACHER BIAS measurement (in months)			0.116** (0.053)
(log) annual equivalised disposable income			0.241*** (0.038)
BAS II Word Reading			0.118*** (0.021)
NFER Progress in Maths			0.044* (0.021)
BAS II Pattern Construction			0.055* (0.023)
CONSTANT		~	-2.957*** (0.476)
<b>N° of Observations</b>		<b>4792</b>	<b>4792</b>
<b>R<sup>2</sup></b>		<b>0.003</b>	<b>0.136</b>
<b>Testing for significance of MAIN EFFECT of ethnicity</b>		<b>F(7,3028)=1.56</b>	<b>F(7, 3028)=3.55**</b>

\* p < .05, \*\* p < .01, \*\*\* p < 0.001

~ Coefficient & SE of the constant are suppressed in M0.

# APPENDIX E

## Average Linear Predictions of TEACHER BIAS by ethnicity groups, M1 & M2

		M1	M2
ETHNICITY	<i>White</i>	-0.009 (0.022)	-0.028 (0.020)
	<i>Mixed</i>	0.081 (0.109)	0.084 (0.107)
	<i>Indian</i>	0.184+ (0.110)	0.174* (0.086)
	<i>Pakistani</i>	-0.040 (0.105)	0.187+ (0.097)
	<i>Bangladeshi</i>	0.198+ (0.108)	0.389*** (0.113)
	<i>Black Caribbean</i>	-0.242 (0.198)	-0.174 (0.164)
	<i>Black African</i>	-0.042 (0.141)	-0.001 (0.133)
	<i>Other ethnic group</i>	0.162 (0.102)	0.239* (0.108)
<b>N° of Observations</b>		<b>4792</b>	<b>4792</b>

These are the average linear predictions computed from the models in APPENDIX D.

\* p < .05, \*\* p < .01, \*\*\* p < 0.001

# APPENDIX F

## OLS regression models of TEACHER BIAS, M4a & M4b

		M4a		M4b	
ETHNICITY	<i>White</i>	0.000	(.)	0.000	(.)
	<i>Mixed</i>	0.139	(0.113)	0.324*	(0.152)
	<i>Indian</i>	0.255*	(0.105)	0.381**	(0.125)
	<i>Pakistani</i>	0.284*	(0.119)	0.327**	(0.116)
	<i>Bangladeshi</i>	0.495***	(0.139)	0.555***	(0.137)
	<i>Black Caribbean</i>	-0.087	(0.173)	0.055	(0.195)
	<i>Black African</i>	0.083	(0.151)	0.200	(0.160)
	<i>Other ethnic group</i>	0.321*	(0.126)	0.458**	(0.145)
GENDER	Female ( <i>ref. male</i> )	0.505***	(0.034)	0.505***	(0.034)
Age at time of TEACHER BIAS measurement (in months)		0.112*	(0.053)	0.114*	(0.052)
(log) annual equivalised disposable income		0.235***	(0.040)	0.238***	(0.040)
BAS II Word Reading		0.119***	(0.021)	0.118***	(0.021)
NFER Progress in Maths		0.043*	(0.021)	0.042*	(0.020)
BAS II Pattern Construction		0.056*	(0.023)	0.058*	(0.023)
T2 – School ethnic composition (% not White)		-0.130	(0.116)		
T2 – School ethnic composition (% same ethnicity as child)				0.258*	(0.125)
T2 – School SES composition (% FSM rounded to nearest 10)		-0.000	(0.002)	-0.000	(0.002)
T2 – School size (continuous)		0.000	(0.000)	0.000	(0.000)
CONSTANT		-2.873***	(0.638)	-3.164***	(0.638)
<b>N° of Observations</b>		4,792		4,792	
<b>R<sup>2</sup></b>		0.137		0.138	
<b>Testing for significance of MAIN EFFECT of ethnicity</b>		F(7,3028)=2.89**		F(7,3028)=3.50**	

\* p < .05, \*\* p < .01, \*\*\* p < 0.001

# APPENDIX G Average Linear Predictions of TEACHER BIAS by ethnicity groups, M4a & M4b

		M4a	M4b
ETHNICITY	<i>White</i>	-0.038 (0.023)	-0.058* (0.027)
	<i>Mixed</i>	0.102 (0.109)	0.266+ (0.139)
	<i>Indian</i>	0.217* (0.097)	0.323** (0.111)
	<i>Pakistani</i>	0.246* (0.111)	0.269* (0.104)
	<i>Bangladeshi</i>	0.458*** (0.130)	0.497*** (0.125)
	<i>Black Caribbean</i>	-0.125 (0.168)	-0.003 (0.184)
	<i>Black African</i>	0.045 (0.144)	0.142 (0.150)
	<i>Other ethnic group</i>	0.284* (0.119)	0.400** (0.131)
<b>N° of Observations</b>		<b>4792</b>	<b>4792</b>

These are the average linear predictions computed from the models in APPENDIX F.

\* p < .05, \*\* p < .01, \*\*\* p < 0.001