

# Understanding Private School Performance in Rural Pakistan

Nick Eubank

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## Explosion of Rural Private Schools

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- ▶ India: in 2005, >20% of rural students in private school.

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Private schools radically outperform government schools.

- ▶ (Alderman, Kim, and Orazem, 2003; Alderman, Orazem, and Paterno, 2001; Andrabi et al., 2011; Desai et al., 2009; Jimenez and Lockheed, 1995; Jimenez, Lockheed, and Paqueo, 1991; Pratham, 2005; Tooley and Dixon, 2003)

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But why?

## Explanation 1: Better Teaching

Better Inputs?

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Better Inputs?

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But perhaps better induced efforts

- ▶ Clearly problem in government: (Chaudhury et al., 2006; Muralidharan and Kremer, 2008)
- ▶ Consistent with US research: Banerjee et al., 2007; Hanushek, 1997; Hanushek, 2003

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- ▶ But lots of problems...
  - ▶ Risk of losing vouchers induces efforts
  - ▶ Selective admission

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If true, then private school superiority is illusory.

- ▶ Problem in light of push for vouchers.  
(Chakrabarti and Peterson, 2008; Kelkar, 2006; Panagariya, 2008)

# Contribution

Examines compatibility with novel finding:  
Private school dominance declines by 50% with village caste fractionalization.

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Private school dominance declines by 50% with village caste fractionalization.

- ▶ Consistent with private school dominance arising from selective “sorting”

# Outline

Methodology

Fractionalization and Performance

School Quality

Selective Sorting

Discussion

## Learning and Educational Attainment in Punjab Schools (LEAPS)

- ▶ 2003-2007 panel data with data from teachers, students, households, and owners.
- ▶ One four year panel (12,110 children)
- ▶ One two year panel (11,852 children)
- ▶ 112 Villages
- ▶ Three Districts
- ▶ Includes: Child Test Scores, Teacher Test Scores, Parental Educational, HH Wealth
- ▶ Test scores are normalized using IRT – mean 0, standard deviation 1.









# Measuring Learning

Lagged-Value-Added Model:

$$Y_{i,t} = \alpha_t X_{i,t} + \alpha_{t-1} X_{i,t-1} + \cdots + \alpha_1 X_{i,1} + \epsilon_{i,t} \quad (1)$$

# Measuring Learning

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$$Y_{i,t} = X_{i,t} \alpha + Y_{i,t-1} \beta + \epsilon_{i,t} \quad (2)$$

- ▶ Flexible persistence parameter
- ▶ All past scores included to control of measurement error.
- ▶ Controls for differences in initial levels, but not differences in rates.

# Measuring Learning

Village Level:

1. Run Lagged-Value Added regressions with village-school type dummies for each village  $j$ .

$$Y_{i,t} = X_{i,t}\alpha + Y_{i,t-1}\beta + \mathbb{I}_{i,j,type,t}\gamma_{j,type} + \epsilon_{i,t}$$

2. Extract dummies and calculate village public-private gap.
3. Analyze at level of village.

$$Gap_j = Z_j\delta + \eta_j$$

# Measuring Learning

Teacher Level:

1. Run Lagged-Value Added regressions with teacher fixed effects dummies for each teacher  $k$ .

$$Y_{i,t} = X_{i,t}\alpha + Y_{i,t-1}\beta + \mathbb{I}_{i,k,t}\zeta_k + \epsilon_{i,t}$$

2. Extract fixed effect coefficients as estimates of teacher contributions
3. Analyze at level of teacher (weighted by number of students).

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**Fractionalization and Performance**

School Quality

Selective Sorting

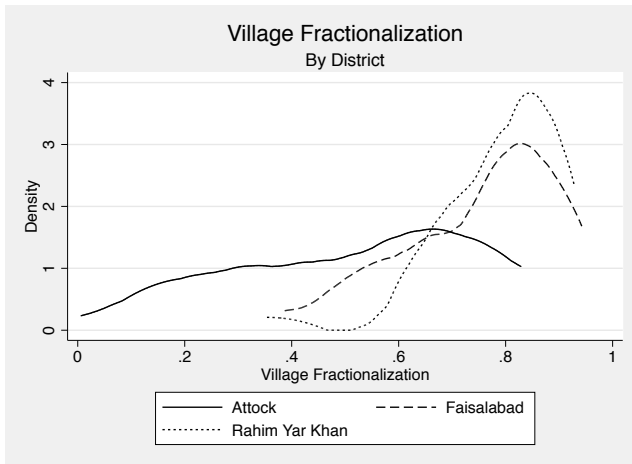
Discussion

# Caste in Punjab

- ▶ Very similar to caste in India
  - ▶ Biraderi implies “an inherent, inbuilt hierarchy that governs social interactions” (Gazdar and Mohmand, 2007, p. 29).
- ▶ Not synonymous with economic status:
  - ▶ “the poorest Jatt is still better off than the richest kammi.” (Gazdar and Mohmand, 2007, p. 13)



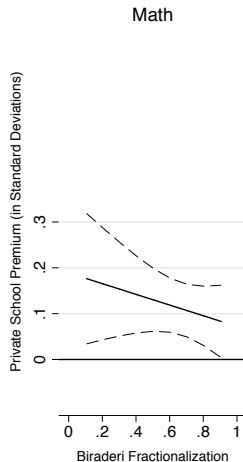
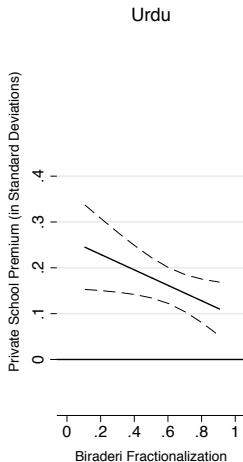
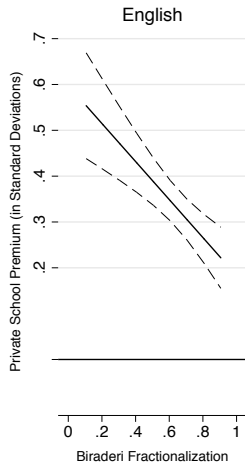
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# Caste Fractionalization and Value Added Scores

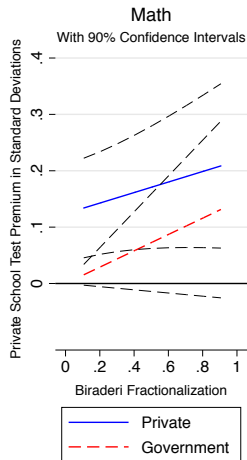
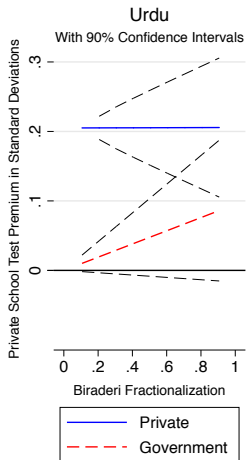
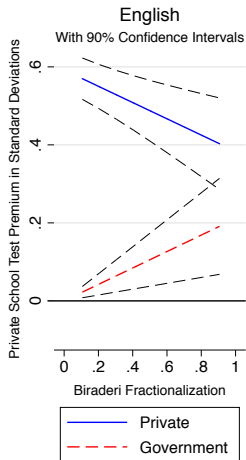
With 90 Percent Confidence Intervals



Controls include village fixed effects, gender, age, age squared, child wealth and parental education

# Caste Fractionalization and Value Added Scores

## With 90 Percent Confidence Intervals



Controls include village fixed effects, gender, age, age squared, child wealth and parental education

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# No Difference in Inputs

Table 4: Private Teacher Characteristics and Village Fractionalization

	(1)	(2)	(3)	(4)	(5)	(6)
	Days Absent	Female	From Village	Teacher English Exam Score	More than Grade School Education	Basic School Facility Index
Biraderi Fractionalization	-0.91 (-1.32)	-0.052 (-0.60)	0.31* (1.71)	0.19 (1.06)	0.20* (1.68)	-0.023 (-0.07)
Median Village Expenditures	0.000054 (0.64)	0.0000057 (0.46)	0.0000030 (0.12)	0.000016 (0.50)	0.000013 (0.68)	0.000049 (1.13)
Log Number of Households	-0.29 (-1.47)	-0.030* (-1.67)	-0.036 (-0.74)	0.045 (0.86)	0.0072 (0.29)	-0.13 (-1.43)
District Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1494	1494	1494	768	1494	493

All results clustered at the village level.

All regressions weighted by number of students.

Robust t-statistics presented in parenthesis.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

# No Difference in Inputs

Table 5: Government Teacher Characteristics and Village Fractionalization

	(1)	(2)	(3)	(4)	(5)	(6)
	Days Absent	Female	From Village	Teacher English Exam Score	More than Grade School Education	Basic School Facility Index
Biraderi Fractionalization	-0.33 (-0.34)	0.099 (0.72)	0.26 (1.20)	0.093 (0.36)	-0.10 (-0.84)	0.32 (0.63)
Median Village Expenditures	-0.00018 (-0.99)	0.000026 (0.99)	-0.0000068 (-0.23)	0.000052* (1.75)	0.000021 (1.23)	0.000033 (0.53)
Log Number of Households	-0.33 (-1.41)	-0.040* (-1.80)	-0.040 (-0.59)	0.034 (0.71)	0.000076 (0.00)	-0.094 (-0.85)
District Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	988	988	988	477	988	291

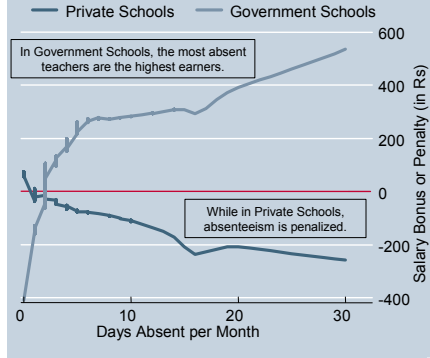
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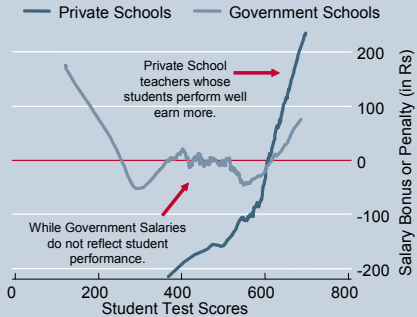
## Teacher Absenteeism and Compensation





## Teacher Compensation

And Student Test Scores



# No Difference in Incentives

Table 6: Village Fractionalization and Teacher Compensation

	Private Teachers		Government Teachers	
	(1) Log Salary	(2) Log Salary	(3) Log Salary	(4) Log Salary
Days Absent Last Month	0.041** (2.00)	-0.0068 (-0.85)	0.0017 (0.40)	0.0041*** (2.79)
Biraderi Fractionalization	0.24 (1.18)	0.21 (0.78)	-0.085 (-1.47)	-0.050 (-0.74)
Days Absent * Fractionalization	-0.063** (-2.05)		0.0050 (0.77)	
Gender	-0.32*** (-3.78)	-0.27** (-2.17)	-0.012 (-0.72)	0.0095 (0.54)
Age of teacher	0.0053 (1.21)	0.023** (2.54)	0.021*** (12.18)	0.018*** (14.48)
Average Value Added Score		0.22 (0.48)		-0.033 (-0.48)
Value-Added * Fractionalization		-0.47 (-0.67)		-0.020 (-0.22)
Constant	7.07*** (29.09)	8.02*** (20.15)	7.51*** (47.83)	7.60*** (61.24)

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Table 7: Child Test Scores and Fractionalization

	English		Urdu		Math	
	(1)	(2)	(3)	(4)	(5)	(6)
Private School	0.31*** (10.98)	0.29*** (10.42)	0.14*** (5.74)	0.14*** (5.65)	0.11*** (3.17)	0.087** (2.58)
Biraderi Fractionalization	0.13* (1.70)	0.096 (1.33)	0.085 (1.26)	0.069 (1.08)	0.13 (1.34)	0.13 (1.46)

# A Sorting Story

Homogenous Villages: Children sort on academic potential.

Fractionalized Villages: Children also sort by social status.

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Homogenous Villages: Children sort on academic potential.

Fractionalized Villages: Children also sort by social status.

1. Parents pick winners

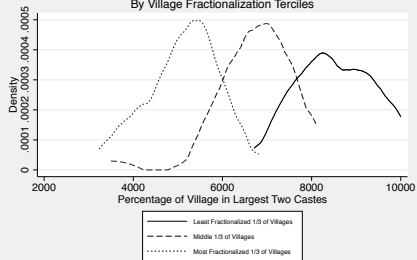
Table 9: School Choice and Child Intelligence

	(1)	(2)
Mom Reports Child Above Average Intelligence	0.058** (2.82)	0.041* (1.99)
Mom Has Some Schooling	0.080 (1.51)	-0.032 (-0.27)
Mom Has Some Schooling	0.084** (3.23)	0.084 (0.71)
Log Month Expenditure	0.043 (1.78)	-0.038 (-1.05)
Age	-0.021*** (-3.76)	-0.017** (-3.26)
Age Squared	0.00025 (1.78)	0.00017 (1.64)
Female	0.029 (1.27)	-0.0012 (-0.04)
Constant	-0.24 (-1.13)	0.35 (1.85)
Village Fixed Effects	Yes	No
Household Fixed Effects	No	Yes
Observations	3426	3426

*t* statistics in parentheses

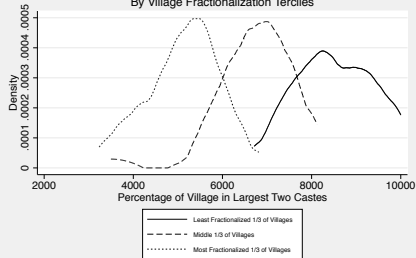
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### Village Caste Concentration By Village Fractionalization Terciles

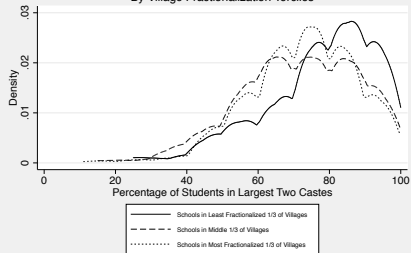




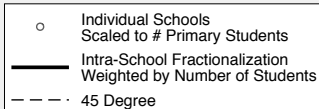
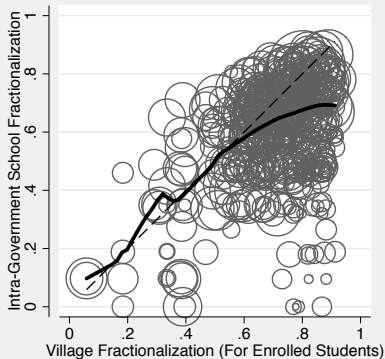
Village Caste Concentration  
By Village Fractionalization Terciles



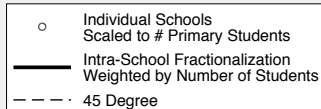
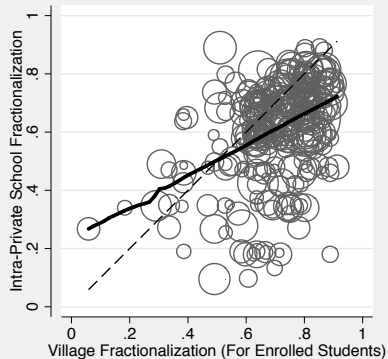
School Caste Concentration  
By Village Fractionalization Terciles



## School Segregation Government Schools



## School Segregation Private Schools



Fractionalization is probability two randomly chosen students will be from different castes.

# Social Status and School Type

	(1) Pct of Students High Status	(2) Pct of Students High Status
Private School	-0.11** (-2.30)	-0.13** (-2.13)
Biraderi Fractionalization	-0.047* (-1.85)	-0.19*** (-14.78)
Fractionalization * Private	0.18** (2.34)	0.21** (2.15)
Median Village Expenditure	0.0000014 (0.87)	
Village: Pct Adults Literate	0.00022 (1.22)	
Log Village Size	0.00074 (0.16)	
Village: Pct High Status	1.01*** (62.12)	
Constant	-0.0039 (-0.10)	1.00*** (83.16)
District Fixed Effects	Yes	No
Village Fixed Effects	No	Yes
Observations	782	782

*t* statistics in parentheses

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

# Fractionalization and Prices

	(1) Weighted by School	(2) Weighted by School	(3) Weighted by Primary Students
Biraderi	504.7**	527.9**	608.6**
Fractionalization	(2.33)	(2.50)	(2.37)
Village: Median		61.6	20.8
Expenditures		(1.25)	(0.44)
Expenditure Gini		-49.9	45.5
		(-0.24)	(0.20)
District Fixed Effects	Yes	Yes	Yes
Observations	287	287	285

*t* statistics in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Inconsistencies

Table 13: School Choice and Child Intelligence

	All		High Status		Low Status	
	(1)	(2)	(3)	(4)	(5)	(6)
Mom: Child Above Avg Intelligence	0.056 (0.66)	0.063 (1.01)	0.15 (1.53)	0.085 (1.22)	0.075 (0.41)	0.28 (1.25)
Biraderi Fractionalization	-0.022 (-0.55)	0.19 (1.00)	0.90*** (22.83)	0.18 (0.76)		0.45** (2.64)
Child Above Avg * Fractionalization	0.0029 (0.02)	-0.031 (-0.35)	-0.14 (-0.96)	-0.067 (-0.64)	-0.067 (-0.26)	-0.35 (-1.19)

# Sorting Paradox

Why pay more for the same education?

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Why pay more for the same education?

**Neighborhood Effects:** Students performance is affected by peers

**Networking:** About forming positive associations.

- ▶ In homogenous villages, most important association is intelligence.
- ▶ In fractionalized villages, caste matters too.



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Places a lower bound on role of sorting.