Case Experiments: "Bringing Education to Afghan Girls: A Randomized Controlled Trial of Village-Based Schools" by D. Burde and L. Linden

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1. Motivation

- Low primary school participation rates in Afghanistan, especially for girls
  - 37% of primary school-age children attended school
  - 17% gender gap in enrollment
- Creation of schools have been prioritized by Government and donor countries as a strategy to address this problem
  - 29% of families live within 5 Km of a primary school
  - Factors limiting access to schools for girls (schools are often far and lack of separate sanitation facilities, female teachers, and gender-segregated classroom)
- Low demand for education and conservative beliefs are important barriers
- This paper studies a simple intervention to promote access to primary schools using an randomized controlled trial

2. PACE-A program in the Ghor Province

- Ghor province was largely unaffected by war, but it does face the same security challenges (tribal conflict, lawlessness and poor state capacity)
- Enrollment rates similar to other areas in Afghanistan:
  - 28% of children aged 6 to 13 are enrolled in school
  - 17% of gender gap enrollment (35% for boys versus 18% for girls)
- Two types of schools: traditional government versus village-based schools
- Village-based school program is run by Catholic Relief Services under the Partnership for Advancing Community Education in Afghanistan (PACE-A)

Type of schools

- Traditional government schools:
  - Large-scale public schools designed to serve children from multiple villages
  - 95% of students enrolled in this type of schools
  - Organized into individual grades with a headmaster responsible for overseeing a tram of teachers who have received formal education training
- Village-based schools:
  - Designed to serve children living in close to proximity to the school
  - Supported by international aid agencies
  - Schools are managed by local staff employed by international development organizations
  - Quality issues: Local teachers with less 12 years, classes are not divided by age, and small number of students

3. Research design

- Sample: 31 villages chosen to receive schools over a 2-year period (13 treatment versus 18 control villages)
- Household surveys (fall 2007 and spring 2008):
  - Basic demographic household information
  - Enrollment status computed for children aged 6 to 11 living in the household
  - Math and language skills were collected by a short test administered by the surveyor
- Self-reported data on school participation
- Scheduling idiosyncrasies: start of classes until early July

Econometric models

- Basic econometric approach:

$$Y_i = \beta_0 + \beta_1 T_k + \beta_2 X_{ij} + \epsilon_{ijk} \tag{1}$$

- Small number of clusters (11 groups of villages randomized with 31 villages in total):
  - Small sample t-distribution with 10 degrees of freedom and clustering standard errors at the village-group level
  - Wild-cluster bootstrap
  - Randomization inference

4. Internal validity

TABLE 1—SAMPLE SIZE AND COVERAGE RATES BY RESEARCH GROUP

	Fall 2007 Survey				Spring 2008 Survey			
	Treatment group (1)	Control group (2)	Estimated difference (3)	Total (4)	Treatment group (5)	Control group (6)	Estimated difference (7)	Total (8)
Panel A. Households surveyed								
Identified	680	663	17	1,343	637	616	21	1,253
Surveyed	635	628	7	1,263	603	582	21	1,185
Percent of households surveyed	0.934	0.947	−0.013 (0.025)	0.94	0.947	0.945	0.002 (0.014)	0.946
Panel B. Households with eligible children								
Households with children	414	391	23	805	399	395	4	794
Percentage with children	0.65	0.618	0.033 (0.037)	0.634	0.662	0.679	−0.017 (0.026)	0.67
Panel C. Children tested								
Identified	782	708	74	1,490	756	721	35	1,477
Tested	721	653	68	1,374	722	679	43	1,401
Percent of children tested	0.922	0.922	< 0.001 (0.020)	0.922	0.955	0.942	0.013 (0.012)	0.949

Notes: This table contains the tabulation of the sample used for the study, divided by survey round and research group. The differences are estimated using equation (1) without controls and with standard errors clustered at the village-group level. Statistical significance at the 1, 5, and 10 percent levels is indicated by ***, **, and *, respectively, and evaluated relative to the small sample *t*-distribution to account for the small number of clusters.

TABLE 2—DEMOGRAPHIC CHARACTERISTICS BY RESEARCH GROUP

	All children			Tested children			Control correlations	
	Treatment average (1)	Control average (2)	Estimated difference (3)	Treatment average (4)	Control average (5)	Estimated difference (6)	Formal enrollment (7)	Total score (8)
Panel A. Child-level variables								
Household head's child	0.935	0.911	0.024	0.939	0.917	0.022	0.038	−0.083
			(0.015)			(0.017)	(0.061)	(0.110)
Girl	0.474	0.455	0.02	0.495	0.475	0.02	−2.09**	−0.687***
			(0.020)			(0.021)	(0.079)	(0.100)
Age	8.321	8.312	0.009	8.323	8.303	0.02	0.046**	0.288***
			(0.040)			(0.051)	(0.017)	(0.019)
Panel B. Household-level variables								
Years family in village	30.302	27.594	2.709	30.239	27.852	2.387	−0.001	−0.005**
			(1.605)			(1.626)	(0.002)	(0.002)
Farsi	0.208	0.209	−0.001	0.209	0.202	0.007	−0.032	0.087
			(0.054)			(0.057)	(0.077)	(0.106)
Tajik	0.243	0.208	0.035	0.245	0.214	0.031	0.02	0.08
			(0.049)			(0.052)	(0.064)	(0.066)
Farmers	0.717	0.727	−0.01	0.709	0.721	−0.013	−0.061	−0.033
			(0.034)			(0.033)	(0.074)	(0.122)
Age of household head	40.142	39.97	0.172	40.268	39.839	0.428	−0.004	−0.004
			(1.101)			(1.045)	(0.002)	(0.002)
Years of education of household head	3.315	3.076	0.239	3.296	3.085	0.211	0.002	0.039***
			(0.442)			(0.446)	(0.007)	(0.006)
Number of people in household	8.399	7.818	0.581	8.462	7.779	0.682*	0.001	−0.008
			(0.340)			(0.329)	(0.004)	(0.011)
Jeribs of land	1.345	1.274	0.071	1.345	1.239	0.106	0.024*	0.059***
			(0.107)			(0.116)	(0.011)	(0.012)
Number of sheep	7.552	5.631	1.921	7.408	5.755	1.653	0.009	0.014*
			(1.504)			(1.486)	(0.004)	(0.006)
Distance to nearest formal school (nonvillage-based school)	2.91	3.163	−0.253	2.923	3.161	−0.238	−0.049	−0.074*
			(0.349)			(0.355)	(0.033)	(0.035)

TABLE 3—ATTRITION PATTERNS BY RESEARCH GROUP

	Nonattritors			Attritors less nonattritors		
	Treatment average	Control average	Estimated difference	Treatment difference	Control difference	Difference-in-differences
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Attrition rates	0.174	0.162	0.011			
	(0.014)	(0.014)	(0.033)			
Panel B. Child characteristics						
Household head's child	0.935	0.919	0.016	−0.001	−0.049	0.048
			(0.020)	(0.023)	(0.029)	(0.042)
Girl	0.481	0.459	0.023	−0.04	−0.024	−0.016
			(0.022)	(0.047)	(0.051)	(0.055)
Age	8.229	8.275	−0.046	0.528	0.229	0.299
			(0.066)	(0.155)	(0.167)	(0.220)
Panel C. Household characteristics						
Years family in village	31.224	28.028	3.197*	−5.302	−2.671	−2.63
			(1.635)	(1.452)	(1.593)	(2.191)
Farsi	0.209	0.204	0.005	−0.003	0.031	−0.034
			(0.055)	(0.038)	(0.041)	(0.051)
Tajik	0.252	0.216	0.036	−0.054	−0.051	−0.003
			(0.054)	(0.040)	(0.041)	(0.098)
Farmers	0.723	0.722	0.001	−0.032	0.035	-0.067
			(0.033)	(0.043)	(0.045)	(0.089)
Age of household head	40.382	39.791	0.591	−1.382	1.105	−2.487
			(1.060)	(1.055)	(1.162)	(1.668)
Years of education of household head	3.379	3.084	0.295	−0.372	−0.054	−0.318
			(0.451)	(0.333)	(0.358)	(0.569)
Number of people in household	8.497	7.862	0.635	−0.563	−0.27	−0.293
			(0.377)	(0.275)	(0.261)	(0.554)
Jeribs of land	1.3	1.264	0.036	0.259	0.062	0.197
			(0.116)	(0.147)	(0.166)	(0.255)
Number of sheep	7.599	5.909	1.69	−0.268	−1.709	1.441
			(1.584)	(0.763)	(0.710)	(0.837)
Distance to nearest formal	2.955	3.137	−0.182	−0.258	0.161	−0.418

5. Outcomes

TABLE 4—TREATMENT EFFECTS BY GENDER

	Formal enrollment		Fall 2007 test		Spring 2008 test	
	No controls	Controls	No controls	Controls	No controls	Controls
	(1)	(2)	(3)	(4)	(6)	(7)
Panel A. Girls						
Treatment	0.521***	0.515***	0.691***	0.654***	0.735***	0.661***
	(0.091)	(0.082)	(0.130)	(0.123)	(0.093)	(0.090)
Observations	693	693	667	667	689	687
R^2	0.34	0.37	0.17	0.36	0.17	0.38
Demographic controls	No	Yes	No	Yes	No	Yes
Panel B. Boys						
Treatment	0.371***	0.347***	0.424***	0.400***	0.380**	0.413***
Observations	797	797	707	707	712	709
R^2	0.16	0.25	0.04	0.4	0.04	0.41
Demographic controls	No	Yes	No	Yes	No	Yes

Notes: This table contains estimates of the effect of the village-based schools by gender. Panel A presents the effects for girls, while panel B presents the results for boys. All standard errors are clustered at the village-group level. Statistical significance at the 1, 5, and 10 percent levels is indicated by ***, **, and *, respectively, and evaluated relative to the small sample *t*-distribution to account for the small number of clusters.

TABLE 5—TREATMENT EFFECTS BY GENDER AND AGE

	Formal enrollment		Fall 2007 test	
	Girls	Boys	Girls	Boys
	(1)	(2)	(3)	(4)
Treatment	0.376***	0.409**	0.285**	0.493***
	(0.093)	(0.134)	(0.101)	(0.149)
Treatment × age	0.059**	−0.027	0.157***	−0.041
	(0.023)	(0.035)	(0.035)	(0.033)
Age	0.005	0.078**	0.159***	0.388***
	(0.015)	(0.025)	(0.022)	(0.015)
Observations	693	797	667	707
R^2	0.38	0.25	0.37	0.41
Demographic controls	Yes	Yes	Yes	Yes

Notes: This table contains estimates of the effect of the village-based schools by gender and age. The first two columns present the effects for girls while the last two present the result for boys. All standard errors are clustered at the village-group level. Statistical significance at the 1, 5, and 10 percent levels is indicated by ***, **, and *, respectively, and evaluated relative to the small sample *t*-distribution to account for the small number of clusters.

6. Concluding remarks

- Significant effect on girls' school participation and reduction in gender gap disparities in educational outcomes:
  - Increase in enrollment for girls of 52 percentage points
  - Increase in girls' test score by 0.65 standard deviation
- Important effects for boys
- Evidence consistent with models in which families face different costs of sending their sons and daughters to schools
- Village-based schools are a viable strategy for getting girls into school