EXAMINING THE CONNECTIONS BETWEEN SCHOOLING AND QUALITY, EARLY MARRIAGE, AND EARLY PREGNANCY AMONG ADOLESCENTS IN RURAL HONDURAS

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The importance of quality education

- Efforts to improve the quality of education in developing countries (Hewlett & Gates; ESRC/DFID)
- "Global learning crisis" (UNESCO, Brookings, Center Global Development)

Critical questions we want to address

- Do different types of schooling have significant effects on demographic outcomes including early marriage and pregnancy?
- To what extent are marriage and childbirth predictors of school drop out (building upon earlier examinations in sub-Saharan Africa, Lloyd & Mensch 2008)?

How we examine these questions

- Building upon earlier research about the innovative secondary (grades 7-12) education program, *Sistema de Aprendizaje Tutorial* (SAT, Tutorial Learning System)
  - Women's empowerment (Murphy-Graham, 2008; 2010; 2012)
  - Civic participation (Honeyman, 2010)
  - Trust in interpersonal relationships (Murphy-Graham and Lample, 2012)

What makes SAT innovative?

- Interdisciplinary curriculum focused on "capability areas"
  - Science, technology, mathematics, language and communication, community service
  - Experiential/applied focus
- System of tutor recruitment, training, professional development/support
- Use of semi-scripted curriculum and student workbooks
- Partnership between Secretary of Education and NGO (in Honduras, Asociación Bayan)

Impact Evaluation of SAT program, 2007-2010, 2016 (our findings today)

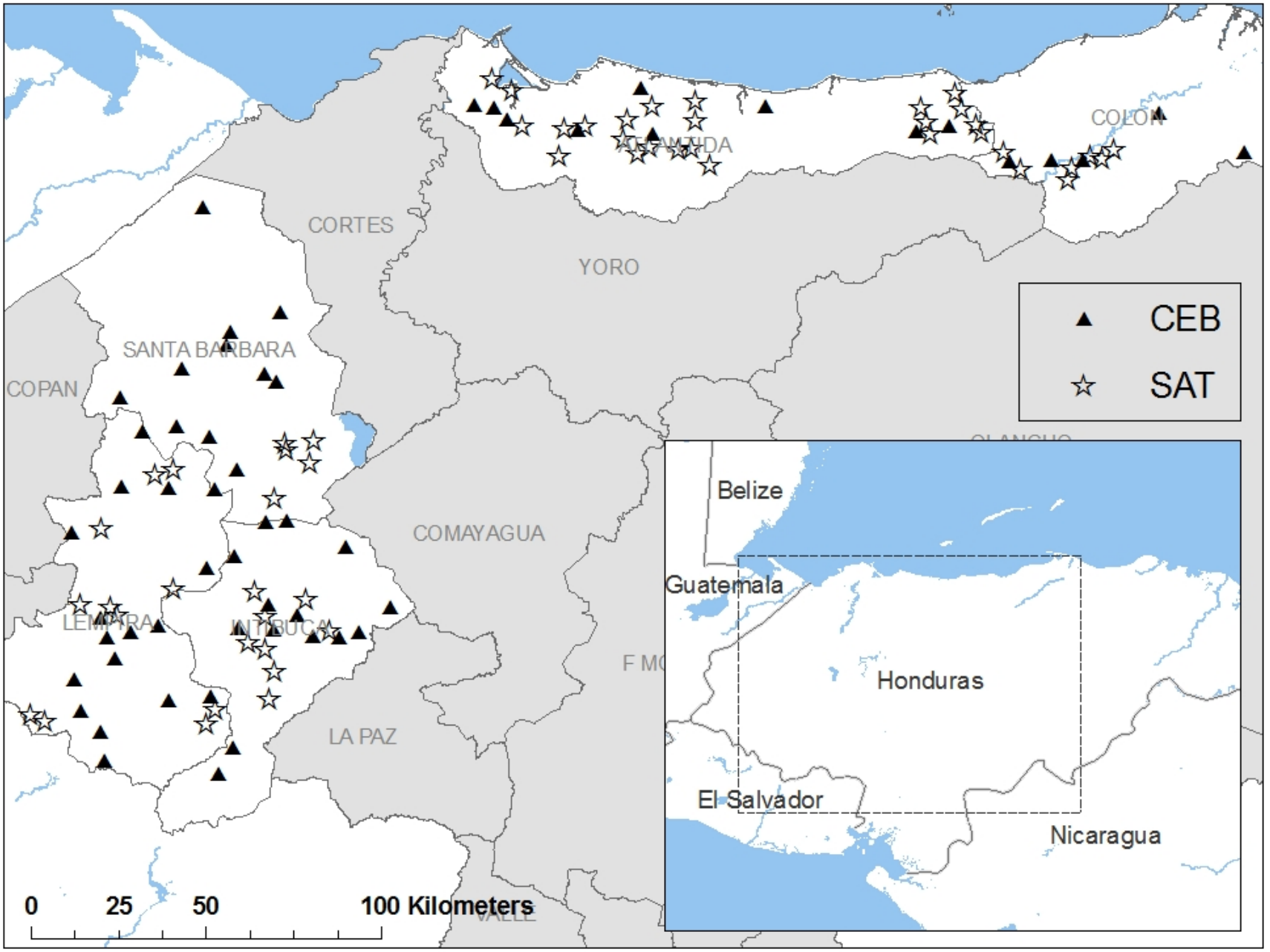
Comparison of two systems of rural education:

- *Sistema de Aprendizaje Tutorial* (S.A.T.)
  - Guided, participatory textbooks; work facilitated by tutor
  - Tutor has secondary degree; in-service training from Bayan
  - Single tutor per cohort
  - Tutor testing, monitoring, accountability
- *Centro de Educación Básica* (C.E.B.)
  - Standard textbooks and lectures; less student participation in lessons
  - Teacher usually has university degree; mixed in-service training
  - Multiple teachers per cohort
  - No teacher testing, mixed monitoring, little accountability

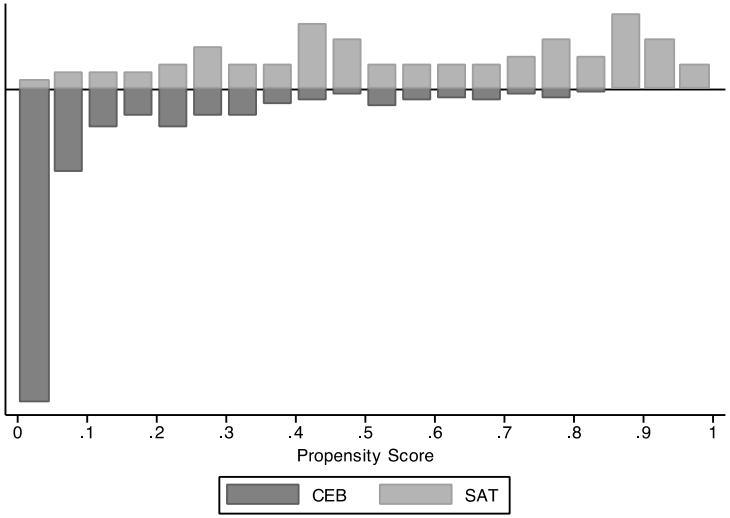
Collaborators: Patrick McEwan, Economics Department Wellesley College, David Torres Irribarra, Pontifica Universidad Católica Chile

Impact evaluation: methodology

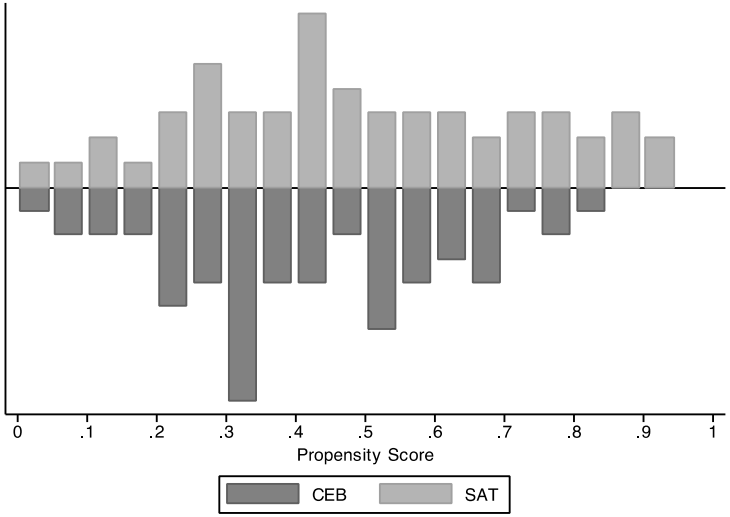
- Quasi experiment:
  - Matched sample of SAT "feeder" primary schools and CEBs
  - Baseline survey/assessment of 6th grade graduates in 2008 (prior to treatment)
  - Follow-up of 2008 cohort, regardless of enrollment in 2009, 2010
  - In-depth qualitative research in 8 communities (4 SAT, 4 CEB)


CORTES
YORO
COLON
SANTA BARBARA
COPAN
COMAYAGUA
LEMPIRA
INTIBUCA
LA PAZ
CEB
SAT
Belize
Guatemala
Honduras
El Salvador
Nicaragua
0
25
50
100 Kilometers

Selection of propensity score matched pairs



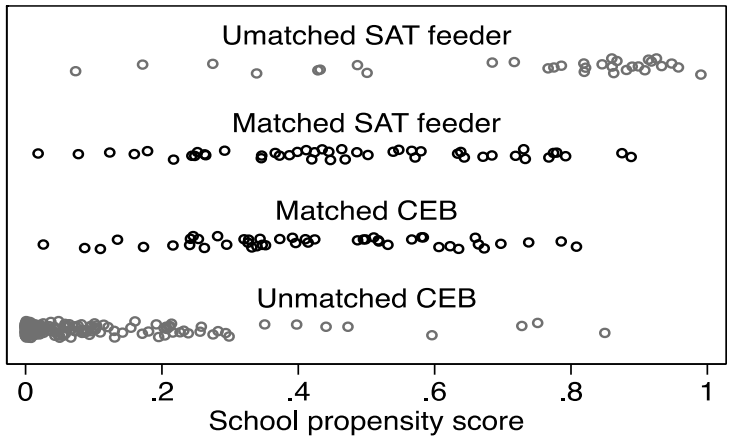
- Population in 5 departments
  - 79 S.A.T. feeder schools
  - 225 C.E.B.s

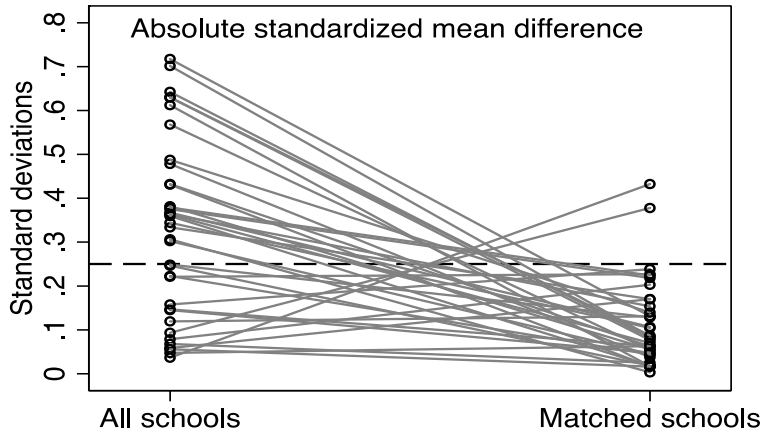


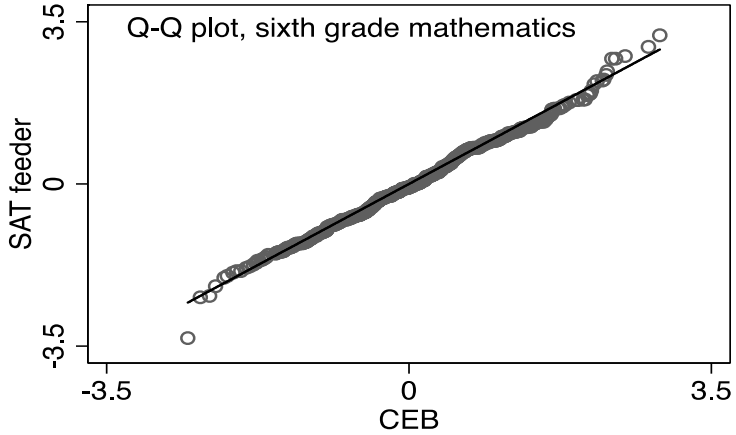
- Baseline sample
  - 47 S.A.T. feeder schools
  - 47 C.E.Bs

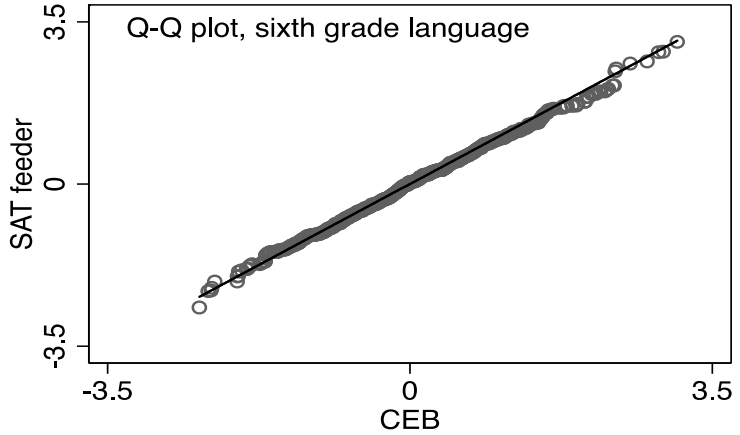
Balance in matched school sample and baseline student sample

- Small (.09-.1 s.d.), statistically insignificant differences in language and math scores, favoring CEB villages









Summary of main findings in 2010

- One-third of eligible students do not enroll in any school; correlated with baseline achievement and wealth proxies.
- Offer of SAT, relative to CEB
  - 0.21 s.d. increase in composite test scores by second year (45% increase in the rate of learning)
  - Estimated cost 18% lower in SAT
- Inputs/processes
  - More instructional materials and days, different pedagogy
  - SAT teachers have more and more-structured in-service training, higher teaching self-efficacy

Increased interest in SAT as model for quality secondary school in rural areas

- Brookings Millions Learning Case Study

"As global problems continue to grow more complex and indiscriminate about geography, this kind of transformative learning model will be ever more relevant in mobilizing rural youth in the creation of more sustainable communities."

Findings from impact evaluation motivate current focus on quality

- ESRC/DFID Raising Learning Outcomes (RLO)
- *What system-wide features of the SAT program explain the quality outcomes?*
- *What are the effects of quality education as youth transition to adulthood?*
  - Early marriage and fertility (building upon Murphy-Graham and Leal, 2013).

Data collection in 2016

- Returned to same 47 pairs of CEB and SAT villages
- Extensive survey of youth (now average age 20) (education, work, demographic outcomes, civic participation, friends, gender attitudes).
- Assessments in Spanish, vocabulary and mathematics
- Qualitative interviews in 8 communities
- In-depth observation of tutor training, classroom observation

Response rates 2016

	N	%
In-person survey	1041	73%
Short, phone version survey	257	18%
TOTAL COMPLETED	**1298**	**91%**

Non-response in 2016

	N	%
Non-viable (death, prison)	12	.8%
Declined to participate	15	1.1%
No contact information	64	4.5%
No contact (en route to USA or Europe)	37	2.6%
Total non-response	128	9%

2016 round of data collection

- Allows us to examine *why* the SAT model improves learning outcomes
  - Focus on science/mathematics teaching
- Today, one slice of our overall study findings, a "deep dive" into what we learn from this mixed-methods longitudinal research project about the impact of quality education on demographic outcomes.

Child marriage in Latin America

Global development Women's rights and gender equality

Mexico's lost generation of young girls robbed of innocence and education

Study reveals rising number of Mexican girls in relationships and marriages with older men and casts fresh light on causes of child marriage in Latin America

The Guardian May 2, 2017

Honduran context: Previous DHS (2011-2012)

- 50% of 20-24 year old Honduran women entered into a union before 20
- 41.8% of 20-24 year old Honduran women had their first child before 20

More detailed DHS summary: Honduras

% of 20-24 year old women in unions before age:	Total Honduras 2011-2012	Rural Honduras 2011-2012
15	7.6%	10.6%
18	33.6%	40.5%
20	50.0%	58.6%

% 20-24 year old women in unions before age:	Rural Honduras DHS 2005-2006	Rural Honduras DHS 2011-2012
15	13.7%	10.6%
18	45.8%	40.5%
20	62.3%	50.0%

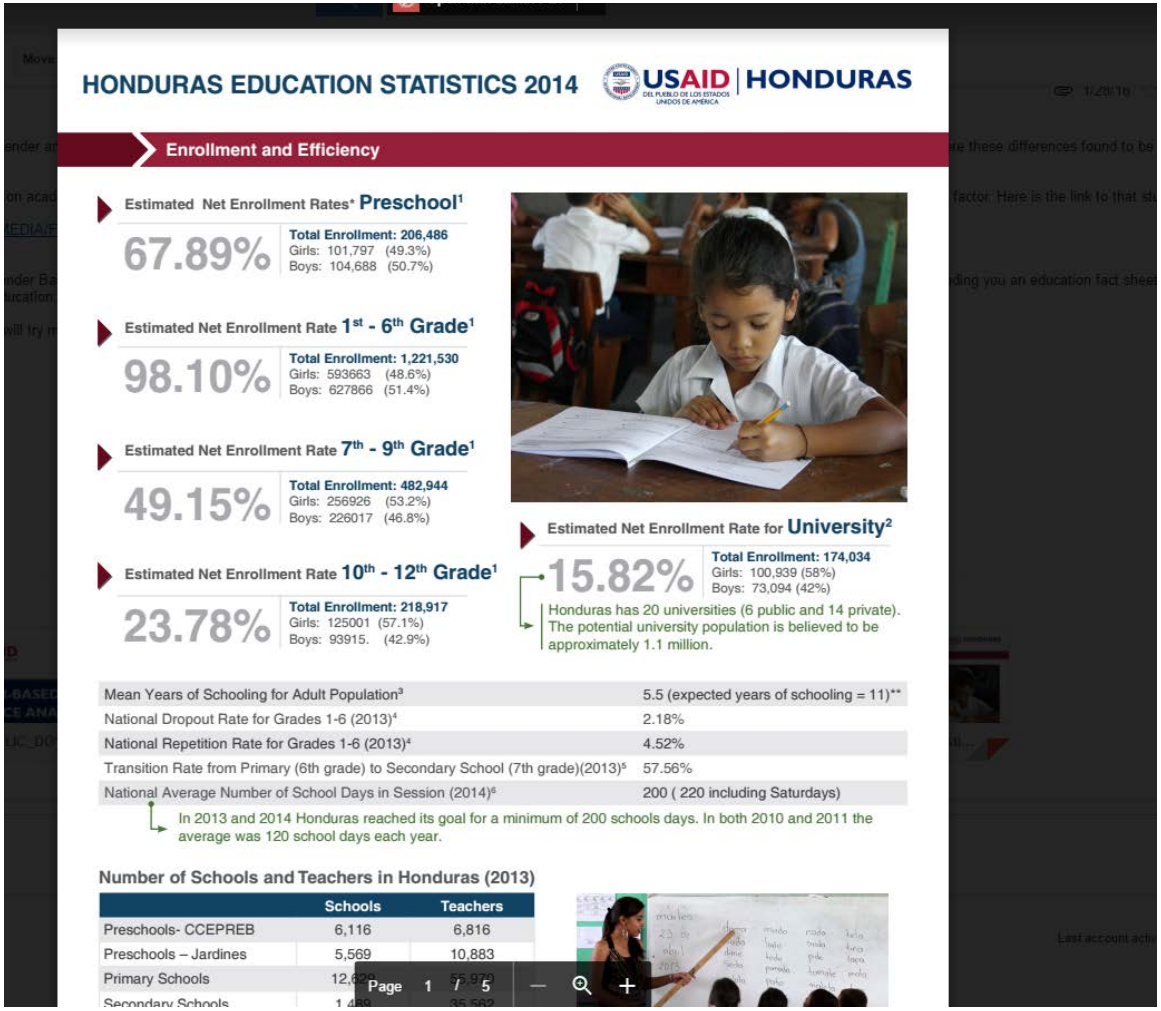
More detailed DHS summary: Honduras

% 20-24 year old women that had first child by age:	Total Honduras DHS 2011-2012	Rural Honduras DHS 2011-2012
15	2.5%	3.4%
18	22.2%	27.0%
20	41.8%	48.1%

% 20-24 year old women that had first child by age:	Rural Honduras DHS 2005-2006	Rural Honduras DHS 2011-2012
15	3.8%	3.4%
18	32.2%	27.0%
20	54.5%	48.1%

We want to know, what happens to schooling, how does it intersect with these events?

Schooling in Honduras: Overview



HONDURAS EDUCATION STATISTICS 2014

USAID | HONDURAS

Enrollment and Efficiency

Estimated Net Enrollment Rates* Preschool[1]

67.89%

Total Enrollment: 206,486
Girls: 101,797 (49.3%)
Boys: 104,688 (50.7%)

Estimated Net Enrollment Rate 1st - 6th Grade[1]

98.10%

Total Enrollment: 1,221,530
Girls: 593663 (48.6%)
Boys: 627866 (51.4%)

Estimated Net Enrollment Rate 7th - 9th Grade[1]

49.15%

Total Enrollment: 482,944
Girls: 256926 (53.2%)
Boys: 226017 (46.8%)

Estimated Net Enrollment Rate 10th - 12th Grade[1]

23.78%

Total Enrollment: 218,917
Girls: 125001 (57.1%)
Boys: 93915. (42.9%)

Estimated Net Enrollment Rate for University[2]

15.82%

Total Enrollment: 174,034
Girls: 100,939 (58%)
Boys: 73,094 (42%)

Honduras has 20 universities (6 public and 14 private). The potential university population is believed to be approximately 1.1 million.

Mean Years of Schooling for Adult Population[3]	5.5 (expected years of schooling = 11)**
National Dropout Rate for Grades 1-6 (2013)[4]	2.18%
National Repetition Rate for Grades 1-6 (2013)[4]	4.52%
Transition Rate from Primary (6th grade) to Secondary School (7th grade)(2013)[5]	57.56%
National Average Number of School Days in Session (2014)[6]	200 (220 including Saturdays)

In 2013 and 2014 Honduras reached its goal for a minimum of 200 schools days. In both 2010 and 2011 the average was 120 school days each year.

Number of Schools and Teachers in Honduras (2013)

	Schools	Teachers
Preschools- CCEPREB	6,116	6,816
Preschools – Jardines	5,569	10,883
Primary Schools	12,6	
Secondary Schools	1,4	

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DHS 2011-2012 Education

Age group (Girls)	Mean years of schooling
15-19	7.7
20-24	8.4

Our data: variables of primary interest

- Relationship status: union (formal marriage or consensual union ("unión libre"), single, divorced, widowed, separated
  - Early union defined as formal marriage or consensual union before age 20
- Childbearing: full history of all pregnancies
  - Early childbearing defined as any childbearing before age 20
- Schooling: full history of educational enrollment for each year 2008-2016
  - This includes enrollment status, level of educational attainment, and school system in which they were enrolled

Data: covariates

- Age
- How respondent spends the majority of their time (e.g., working, studying, housework)
- Region within Honduras
- Household wealth: calculated based on presence of refrigerator, radio, sewing machine, television, VCR or DVD player, computer, bicycle, motorcycle, car, stove
- Lived with both parents in 2008
- Lived in same location from 2008-2016

Analytic approach

- Conducted descriptive and analytic statistics in Stata 14.2.

Overview of our sample 2016

- 684 rural female Hondurans in sample
- Mean age in 2016: 20.1 (SD: 1.2)
- Current relationship status: 56.4% single, 35.7% in consensual union, 4.8% in formal marriage, 3.1% divorced, widowed, or separated
- 46.4% had had children (mean number of kids for whole sample was 0.58)
- Only 28.7% of girls were continuously enrolled 2008-2014 (through end of high school)

Understanding school dropout, pregnancy, and unions across adolescence for rural female youth

Year (average age)	% who were not enrolled or dropped out by end of school year	% who had their first child in that year	% who entered into a union in that year
2008 (12)	0.7%	0%	0.4%
2009 (13)	35.8%	0.7%	1.6%
2010 (14)	40.4%	2.0%	5.0%
2011 (15)	43.7%	4.4%	5.8%
2012 (16)	65.3%	9.2%	7.9%
2013 (17)	67.4%	8.9%	9.4%
2014 (18)	68.4%	8.0%	7.7%
2015 (19)	87.2%	10.1%	6.4%
2016 (20)	n/a	2.8%	3.1%

Understand school dropout, pregnancy, and unions across adolescence for rural female youth

Year (average age)	**% who were not enrolled or dropped out by end of school year**	% who had their first child in that year	% who entered into a union in that year
2008 (12)	**0.7%**	0%	0.4%
2009 (13)	**35.8%**	0.7%	1.6%
2010 (14)	**40.4%**	2.0%	5.0%
2011 (15)	**43.7%**	4.4%	5.8%
2012 (16)	**65.3%**	9.2%	7.9%
2013 (17)	**67.4%**	8.9%	9.4%
2014 (18)	**68.4%**	8.0%	7.7%
2015 (19)	**87.2%**	10.1%	6.4%
2016 (20)	**n/a**	2.8%	3.1%

Understanding enrollment status

Year (average age)	Enrolled in school and finished the grade successfully	Enrolled in school and finished the grade but failed to advance	Enrolled in school but did not finish the grade	Not enrolled	Total not enrolled, dropped out, or otherwise failed to advance by the end of the year
2008 (12)	99.3%	0.2%	0.5%	0%	0.7%
2009 (13)	64.2%	0.3%	4.6%	30.9%	35.8%
2010 (14)	59.6%	0.7%	2.9%	36.9%	40.4%
2011 (15)	56.3%	0.3%	2.0%	41.3%	43.7%
2012 (16)	34.7%	0.6%	4.5%	60.1%	65.3%
2013 (17)	32.6%	0.6%	1.6%	65.2%	67.4%
2014 (18)	31.6%	0.3%	1.1%	67.0%	68.4%
2015 (19)	12.8%	0.1%	0.9%	86.1%	87.2%

Dropout/failure to advance by school system (for girls)

Year (averge age)	SAT villages	CEB villages	Total sample
2008 (12)	0.8%	0.7%	0.7%
2009 (13)	40.7%	31.4%	35.8%
2010 (14)	45.4%	35.8%	40.4%
2011 (15)	46.9%	40.7%	43.7%
2012 (16)	61.1%	69.0%	65.3%
2013 (17)	64.3%	70.2%	67.4%
2014 (18)	66.4%	70.1%	68.4%
2015 (19)	90.3%	84.3%	87.2%

Enrollment/"main" reason for non-enrollment

Year (grade)	Was enrolled in school	Not enrolled: no longer wanted to be student	Not enrolled: economic reasons	Not enrolled: became pregnant	Not enrolled: became married	Not enrolled: other (e.g., work opportunity, taking care of siblings)
2008 (6)	99.5%	0.1%	0%	0.1%	0%	0.1%
2009 (7)	67.5%	12.3%	12.3%	0.9%	0.9%	6.2%
2010 (8)	63.2%	14.0%	13.1%	1.1%	2.8%	5.7%
2011 (9)	59.9%	16.3%	13.9%	1.1%	3.4%	5.5%
2012 (10)	39.3%	21.0%	19.7%	4.4%	4.4%	11.2%
2013 (11)	37.3%	20.6%	23.1%	3.6%	6.0%	9.4%
2014 (12)	36.1%	21.1%	22.4%	2.8%	6.7%	10.8%
2015	15.5%	23.6%	34.1%	4.1%	7.5%	15.3%
2016	14.2%	24.2%	34.6%	1.8%	8.2%	17.1%

Re-enrollment post-pregnancy/union uncommon

- 8.3% of those who had entered into a union (n=324) attained more education after their first union
- 6.3% of those who had had a pregnancy (n=316) attained more education after their first pregnancy.

Understanding school dropout, pregnancy, and unions across adolescence for rural female youth

Year (average age)	% who were not enrolled or dropped out by end of school year	**% who had their first child in that year**	**% who entered into a union in that year**
2008 (12)	0.7%	**0%**	**0.4%**
2009 (13)	35.8%	**0.7%**	**1.6%**
2010 (14)	40.4%	**2.0%**	**5.0%**
2011 (15)	43.7%	**4.4%**	**5.8%**
2012 (16)	65.3%	**9.2%**	**7.9%**
2013 (17)	67.4%	**8.9%**	**9.4%**
2014 (18)	68.4%	**8.0%**	**7.7%**
2015 (19)	87.2%	**10.1%**	**6.4%**
2016 (20)	n/a	**2.8%**	**3.1%**

Age at first union

Age	Percent who entered a union (union libre or formal marriage)	Cumulative proportion in a union at each age
12	0%	0%
13	0.6%	0.6%
14	3.2%	3.9%
15	**6.9%**	10.7%
16	**8.8%**	19.4%
17	**7.8%**	27.2%
18	**9.5%**	36.7%
19	6.4%	43.1%
20	3.1%	46.2%

Cumulative proportion may not align perfectly with percents in first column due to rounding.

Early childbearing and early union

	Had at least one child before age 20	Had no children before age 20
Entered into a union before age 20	31.8%	11.3%
Had never entered into a union before age 20	7.5%	49.4%

Most pregnancies occur within unions, but this varies by age

Age	Percent of pregnancies that occurred after entering into a union (n=307 pregnancies)	Percent of pregnancies that occurred while not in a union (n=85 pregnancies)
12 (n=0 pregnancies)	n/a	n/a
13 (n=5 pregnancies)	0%	100%
14 (n=7 pregnancies)	71.4%	18.6%
15 (n=25 pregnancies)	72.0%	28.0%
16 (n=60 pregnancies)	76.7%	23.3%
17 (n=76 pregnancies)	75.0%	25.0%
18 (n=83 pregnancies)	84.3%	15.7%
19 (n=65 pregnancies)	78.5%	21.5%
20 (n=45 pregnancies)	84.4%	15.6%
Over 20 (n=28 pregnancies)	85.7%	14.3%
TOTAL (n=392 pregnancies)	78.3%	21.7%

Dropout, childbearing, and unions

- What, if anything, predicts dropout, childbearing and unions?
- Given how few youth stay in school, can we learn about effects of "quality" (SAT) on these outcome measures?

Predictors of staying in school through end of 12th grade

	Odds ratio	p-value	95%CI
Demographics			
Age	0.57	<0.0005	0.46-0.71
Completed 2016 survey on telephone	0.97	0.93	0.56-1.69
Region in 2008 (reference group: north)			
West	0.83	0.47	0.49-1.38
Education			
School system available in village (reference: CEB)			
SAT	1.13	0.59	0.72-1.78
2008 test scores			
Math z-score	1.29	0.08	0.97-1.73
Spanish z-score	1.33	0.05	1.00-1.77
Household characteristics			
Lived with both parents in 2008	1.32	0.28	0.80-2.18
Household wealth in 2008	1.24	<0.0005	1.12-1.38

Predictors of union before age 18

	Odds ratio	p-value	95%CI
Demographics			
Age	1.05	0.55	0.89-1.24
Completed 2016 survey on telephone	1.14	0.60	0.69-1.89
Region in 2008 (reference group: north)			
West	0.72	0.18	0.44-1.17
Education			
School system in 2009 (reference: no school)			
SAT	0.79	0.40	0.45-1.38
CEB	0.67	0.12	0.41-1.11
other	0.81	0.61	0.36-1.83
2008 test scores			
Math z-score	0.96	0.74	0.74-1.24
Spanish z-score	1.07	0.59	0.82-1.39
Household characteristics			
Lived with both parents in 2008	0.96	0.87	0.62-1.50
Household wealth in 2008	0.90	0.05	0.81-1.00

Predictors of childbearing before age 18

	Odds ratio	p-value	95%CI
Demographics			
Age	0.90	0.26	0.75-1.08
Completed 2016 survey on telephone	0.87	0.63	0.50-1.52
Region (reference group: north)			
West	0.74	0.24	0.44-1.22
Education			
School system in 2009 (reference: no school)			
SAT	0.58	0.09	0.31-1.08
CEB	0.69	0.18	0.41-1.18
other	1.10	0.83	0.49-2.47
2008 test scores			
Math z-score	0.85	0.25	0.64-1.12
Spanish z-score	1.21	0.18	0.91-1.60
Household characteristics			
Lived with both parents in 2008	0.72	0.15	0.45-1.13
Household wealth in 2008	0.91	0.10	0.82-1.02

Complementarity of qualitative data

Insights regarding quality education for girls and demographic outcomes:

What can education do? What can't it do?

Summary of findings from in-depth interviews with 14 girls who were in unions in 2016.

Quality education can…

- Foster (some) women's empowerment
  - Leadership
  - Involvement in community/service to community
- Teach practical skills that are useful and relevant in daily lives, (**retention of learning**)
  - Animal raising, agriculture
  - Basics of accounting, teaching children to read
- Foster quality relationships with others/friendships
  - Strengthen social fabric of community
- Encourage/nudge towards more **egalitarian unions**
  - Consultation, intimacy, partnership, negotiation re family planning

But can quality education overcome…?

The larger forces in society that intersect with girls' lives:

- Poverty
- No jobs
- Lack of credit
- No opportunities for women other than housewife, desirability of motherhood even at early age

Education might change/improve lives, but in ways difficult to measure, particularly given the significant dropout.

Concluding thoughts for discussion

- Early unions more common than early pregnancy as reason for dropout.
- Very low rates of secondary completion (and this is where option exists)
  - Economic reasons and non-interest are more often the reasons why women left school than pregnancy or a union
    - *Demographic implications: Prevent dropout at all cost?*
- No associations between quality of school system and early childbearing and early unions.
  - This may be because all school systems have achieved a baseline level of adequacy (no abuse), or because dropout is so prevalent that few girls are exposed to a meaningful amount of school.
  - Our study has limited statistical power
  - Judicious opportunism (Johnson Hanks, 2005), opportunistic agency (Murphy-Graham and Leal, 2013) might drive dropout and demographic outcomes.

Implications for research and practice

- Our current project, design-based research study that is creating an intervention that will be integrated into SAT that focuses on reducing early union and pregnancy, and tries to improve **gender equality** in relationships.

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- Contact information: emurphy@berkeley.edu and akcohen@berkeley.edu

Enrollment status for males

Year	Enrolled in school and finished the grade successfully	Enrolled in school and finished the grade but failed to advance	Enrolled in school but did not finish the grade	Not enrolled	% that did not enroll, dropped out, or failed to advance by the end of the year
2008	98.5%	0.2%	0.1%	0%	0.3%
2009	57.3%	0.8%	6.1%	35.8%	42.7%
2010	53.7%	0.8%	4.8%	40.8%	46.3%
2011	50.6%	0.2%	2.4%	44.9%	49.4%
2012	30.1%	0.2%	5.1%	64.5%	69.9%
2013	28.1%	0.2%	2.4%	69.3%	71.9%
2014	26.0%	0%	1.4%	72.6%	74.0%
2015	10.9%	0%	1.2%	87.9%	89.1%