Impact of English instruction on labor market outcomes

The case of Mexico

Oscar Galvez-Soriano

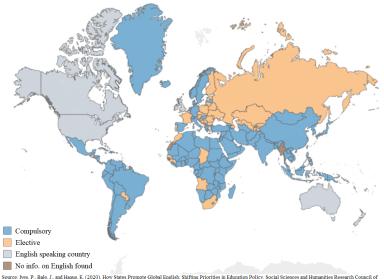
University of Houston Department of Economics

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Motivation

Motivation: Global English education policy





Motivation

The value of English language skills in non-English speaking countries

- Globalization: trade and culture (internet, news, social media, etc.)
- Mobility and labor market outcomes

I will study the expansion of English instruction in Mexico

Related literature

Most related to this literature:

- Returns to English language skills
 - In English-speaking countries: Bleakley and Chin (2004);
 Chiswick and Miller (2015)
 - In non English-speaking countries: Lang and Siniver (2009);
 Azam, Chin and Prakash (2013)
- English instruction in schools
 - Policy change in the medium of instruction: Angrist, Chin and Godoy (2008); Eriksson (2014)
 - Exposure in a former British colony: Chakraborty and Bakshi (2016)

I study English instruction as a subject in Mexican public primary schools



Main contributions of this paper

Research question

• What is the effect of exposure to English instruction on labor market outcomes in a non-English speaking country?

Empirical strategy

- Variation in exposure driven by a policy change in Mexico
- Rich data connecting individuals first observed in primary school to their labor market outcomes
- Use school by cohort variation for very narrow cohort span

Key findings

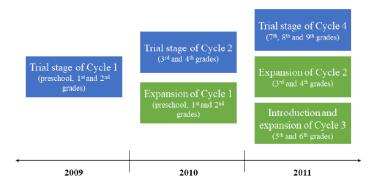
- No average effect on wages, but positive effect among high-achieving individuals
- Shifts between and within industries



Policy background

National English Program in Basic Education (NEPBE) launched in 2009 in Mexico

- Introduced English instruction in public primary schools
- Funded by the central government
- Implemented gradually



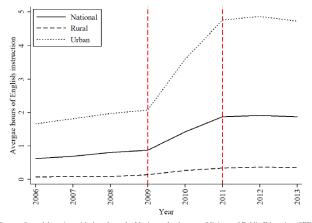
Note: NEPBE was launched in 2009 as a trial stage with the called Cycle 1. In 2010 the program continued the trial stage with the Cycle 2 and expanded Cycle 1. Finally, in 2011 the program introduced for the first time and expanded Cycle 3, benefiting fifth and sixth graders.



Motivation 00000000



Policy background: English instruction over time



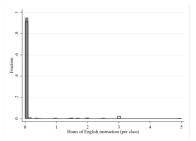
Source: Own elaboration with data from the Mexican school census, Ministry of Public Education (SEP).

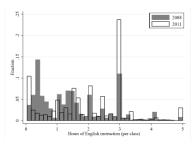
Note: Hours of English instruction are measured as the weekly hours average over the universe of Mexican elementary schools. Similarly, the number of English teachers refers to the average number of English teachers across elementary schools. The vertical dotted line in 2009 highlights the implementation year of the NEPBE's trial stage, while the dotted line in 2011 highlights the expansion of the program.





Policy background: Distribution of hours of English instruction (2008 vs 2011)





(a) Hours of English instruction

(b) Hours of English instruction (w/o zeros)

Note: Frequency of the indicated variables are plotted. Histograms at the right do not show zeros, which capture most of the distribution. Hours of English instruction are calculated by dividing the average weekly hours in a school by the total number of classes.



→ Proportion of schools



Human capital framework

How might English instruction in primary school affect labor market outcomes?

- English language skills
 - Expand the set of jobs individuals can get
 - Possible complementarity with cognitive skills
- Other skills
 - Reduces time on other subjects or school activities
 - Possible complementarities with other subjects

- Challenging to estimate the effect of exposure to English instruction on labor market outcomes
- Key concern: schools that offered English instruction are systematically different from those that did not
 - Likely to have positive selection bias, e.g., schools offering English instruction located in richer neighborhoods
- I address this by using a school FE approach
 - Intuition: compare students from the same school, some with more English instruction and some with less
 - Data of the universe of primary school students, able to connect to their labor market outcomes



Measure of exposure to English instruction • Hrs

Birth	Primary school							
Bi	1st 2nd 3rd 4th 5th 6t							
1997								
1998								
1999								
2000						2011		
2001				2010	2011	2012		
2002		2009	2010	2011	2012	2013		

- Using the Mexican school census, I calculate weekly hours of English instruction (per class), for each school-year
- For each school-cohort, I average the hours of English instruction from 1st to 6th grade
 - I assume students enter school at age 6 and had normal progression until 6th grade



I estimate the following equation to get the effect of exposure to English instruction on labor market outcomes:

$$y_{isc} = \alpha + \beta \cdot ExpEng_{sc} + X_{isc}\gamma + \zeta_c + \nu_s + \tau_t + \varepsilon_{isc}$$

where y_{isc} is the labor market outcome of individual i, who attended school s and belongs to cohort c

➤ Descriptive



I construct a unique data set connecting restricted-use

administrative data of students and their labor market outcomes for birth cohorts 1997-2002

- ENLACE (2006-2013): universe of primary school students
 - I know what school they attended
 - Reading and mathematics test scores
- Mexican school census (2003-2013)
 - School characteristics: weekly hours of English instruction
- Social Security data (2018-2021)
 - I use individual ID to match students to their labor market outcomes
 - Formal sector
 - Individuals between 16-24 years old



Data: Labor market outcomes

I investigate the effect of exposure to English instruction on four main labor market outcomes:

- Works in formal sector
 - Dummy for being in social security data among the universe of students
- ② Wages (average monthly wage) → IMSS
- Geographical mobility
 - Distance from home to working county
 - Moving from home state
- Industries (NAICS)

 Codes

 Output

 Description:

 Output

 D
 - Dummies for agriculture, construction, manufacturing and services industries



Estimation results: Sample selection

Table 2: Exposure to English instruction and labor market outcomes (Social Security data)

	(1)	(2)	(3)	(4)
	Formal	ln(wage)	ln(distance)	Move
	sector			state
Panel A: Full samp	ole			
Hrs English	-0.013***	-0.015***	-0.035***	-0.004***
	(0.001)	(0.002)	(0.008)	(0.001)
Observations	16,938,183	4,055,434	4,055,434	4,055,434
Adjusted \mathbb{R}^2	0.105	0.270	0.477	0.555

- Concern about selection into social security data
- Possibly because individuals are still enrolled in school
- Use counties where it is less likely that they are enrolled



> Test scores



Proposed solution: Construction of low-enrollment sample

- Using the 2020 Mexican Population Census, I construct a county-enrollment rate variable
 - Enrollment rates in first year of college (2002 cohort)
- 2 I keep the data with 38 percent (or less) of individuals enrolled in school
- The low-enrollment sample represents 6.4% of the full sample







Labor market outcomes with low-enrollment sample

 ${\bf Table~2:~Exposure~to~English~instruction~and~labor~market~outcomes~(Social~Security~data)}$

	(1)	(2)	(3)	(4)
	Formal	ln(wage)	ln(distance)	Move
	sector			state
Panel B: Low enroll	$ment\ sample$			
Hrs English	-0.012	-0.005	-0.058	0.015**
	(0.008)	(0.011)	(0.044)	(0.007)
Observations	1,554,827	259,666	259,666	259,666
Adjusted R^2	0.123	0.312	0.677	0.727
Mean of dep. var.	0.17	8.68	3.69	0.45

Table 2: Exposure to English instruction and labor market outcomes (Social Security data)

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Labor market outcomes with low-enrollment sample

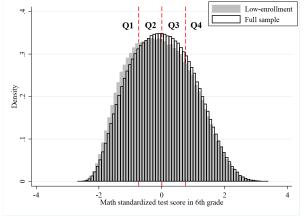
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	(1)	(2)	(3)	(4)
	Formal	ln(wage)	ln(distance)	Move
	sector			state
Panel B: Low enroll	$ment\ sample$			
Hrs English	-0.012	-0.005	-0.058	0.015**
	(0.008)	(0.011)	(0.044)	(0.007)
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Mean of dep. var.	0.17	8.68	3.69	0.45

Labor market outcomes by cognitive abilities

Now let us allow the effect to vary by cognitive abilities

• I am able to explore this because I observe test scores in primary school



Labor market outcomes by cognitive abilities

Table 3: Exposure to English instruction and labor market outcomes by abilities
(Social Security data)

(Social Security data)					
	(1)	(2)	(3)	(4)	
	Formal	ln(wage)	ln(distance)	Move	
	sector			state	
Panel A: Low enr	$ollment \ sam$	ple			
Hrs English	-0.007	-0.013	-0.079	0.021**	
	(0.009)	(0.012)	(0.049)	(0.010)	
$Eng \times Q2$	-0.003	-0.003	-0.018	-0.011	
	(0.006)	(0.009)	(0.047)	(0.008)	
$Eng \times Q3$	-0.005	0.031***	0.012	-0.017	
	(0.006)	(0.009)	(0.036)	(0.011)	
$Eng \times Q4$	-0.013**	0.012	0.106***	0.001	
	(0.006)	(0.012)	(0.040)	(0.012)	
Observations	1,554,827	259,666	259,666	259,666	
Adjusted \mathbb{R}^2	0.123	0.312	0.677	0.727	

Note: The quartile Q4 contains the top part of the abilities' distribution with individuals obtaining the highest Math test scores.



English instruction and economic industries

Table 4: Exposure to English instruction and economic industries (Social Security data)

	(1)	(2)	(3)	(4)
	Agri-	Con-	Manu-	Serv-
	culture	struction	facturing	ices
Panel B: Low enrolls	ment samp	le		
Hrs English	-0.012**	-0.025**	0.040**	-0.003
	(0.006)	(0.010)	(0.017)	(0.016)
Observations	259,666	259,666	259,666	259,666
Adjusted R^2	0.402	0.388	0.342	0.292
Mean of dep. var.	0.11	0.16	0.39	0.34

We observe shifts across industries (consistent with more mobility). Implications and potential causes:

- Different career path
- More employment opportunities?
- Individuals perceive a broader choice set?







Exploring mechanisms

- Mechanism 1: English abilities
 - I cannot test directly this mechanism because my data set does not have a measure of English abilities
 - Evidence I will show:
 - Galvez-Soriano (2023) shows that exposure to English instruction in primary school increases the probability of speaking English
 - Workers are systematically moving to economic industries requiring English abilities
- Mechanism 2: Other cognitive abilities
 - Language (Spanish)
 - Mathematics



Effect of exposure to English instruction on student achievement:

$$test_score_{isc} = \theta + \phi \cdot ExpEng_{sc} + X_{isc}\gamma + \zeta_c + \nu_s + \varepsilon_{isc}$$

where $test_score_{isc}$ is the 6th grade test score of student i, who attended school s and belongs to cohort c



Mechanism 2: Cognitive abilities * Full sample

Table 7: Exposure to English instruction and student achievement

	(1)	(2)			
	Language 6th	Math 6th			
Low enrollment samp	ple				
Hrs English	0.0476	0.0094			
	(0.0470)	(0.0344)			
Observations	259,666	259,666			
Adjusted \mathbb{R}^2	0.351	0.381			

- Exposure to English instruction does not affect other cognitive abilities
- English skills?
- Industries requiring English skills



Data

- I use the 2014 Subjective Well-being Survey (BIARE)
- Representative at national and state level
- Asks if the respondent speaks English
- Only 3% reported they speak English

Empirical strategy

Take advantage of state policy changes in English instruction

$$y_{isc} = \theta + \psi \cdot HadPolicy_{sc} + \delta_s + \kappa_c + X_{isc}\Psi + \varepsilon_{isc}$$

where $HadPolicy_{sc}$ takes the value of one if individual i lives in a treated state and he/she belongs to one of the affected cohorts (zero otherwise)





Data

- I use the 2014 Subjective Well-being Survey (BIARE)
- Representative at national and state level
- Asks if the respondent speaks English
- Only 3% reported they speak English

Empirical strategy

Take advantage of state policy changes in English instruction

$$y_{isc} = \theta + \psi \cdot HadPolicy_{sc} + \delta_s + \kappa_c + \mathbf{X}_{isc} \mathbf{\Psi} + \varepsilon_{isc}$$

where $HadPolicy_{sc}$ takes the value of one if individual i lives in a treated state and he/she belongs to one of the affected cohorts (zero otherwise) \longrightarrow PTA



Table: Intention to Treat effect of offering English instruction at school (SDD estimate)

	(1)	(2)
	$_{ m Hrs}$	Speak
	Eng	Eng
Panel A: Full samp	ole	
Had Policy	0.308***	0.015**
	(0.046)	(0.008)
Observations	13,131	13,131
Adjusted \mathbb{R}^2	0.596	0.075

Mechanism 1b: Workers moving to jobs requiring English skills

- Same social security data I use in the labor market analysis
- Use BIARE to I construct an index of economic industries by English skills
 - According to the NAICS at four-digit code
- For each manufacturing and services, I form dummy variables indicating if job requires English
 - Dummy for high-English manufacturing jobs indicating industries with more than 8% of English speakers
 - Dummy for low-English manufacturing jobs indicating industries with less than 8% of English speakers
 - Similarly for services



Mechanism 1b: Workers moving to jobs requiring English skills

Table 6: Exposure to English instruction and economic industries (Social Security data)

	(1)	(2)		(3)	(4)
_	Manufacturing			Serv	vices
	High Low		_	High	Low
	English	English		English	English
Panel B: Low enroll	ment sampl	e			
Hrs English	0.060***	-0.026**		0.046***	-0.039***
	(0.013)	(0.012)		(0.014)	(0.011)
Observations	259,666	259,666		259,666	259,666
Adjusted \mathbb{R}^2	0.175	0.189		0.145	0.116

→ Manu Ind

→ Svcs Ind

→ Abilities



Robustness Checks

- Concern about TWFE estimator in the presence of heterogeneous treatment effects ** TWFE
- Concern about differential cohort trends across labor markets
 State by cohort
- Different exposure variable ** Exposure
- Different enrollment thresholds Threshold Test scores
- No-changes in private school enrollment Private enrollment
- No-effects on other resources >> Teachers



Discussion

• Exposure to English instruction in Mexican primary schools

Results

- Has, on average, no significant effect on wages
- But positive returns among high-achieving kids
- Across industries: shifts workers out of agriculture and construction
- Within industries: shifts workers to jobs requiring English abilities
- Consistent with English skills mediating these effects of English instruction
 - Evidence from previous state English programs (Galvez-Soriano, 2022)
 - No effect on other cognitive skills



Thank you!

For more about me and my research, please scan here:



Measuring hours of English instruction



Benito Juarez Elementary School

Weekly hours of English instruction	18
Number of classes	6
Hours of English instruction (per class)	3





→ Distribution

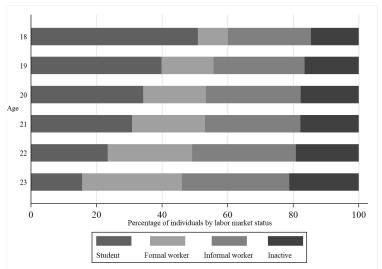


Descriptive statistics (matched data sets)

Table 1: Descriptive statistics

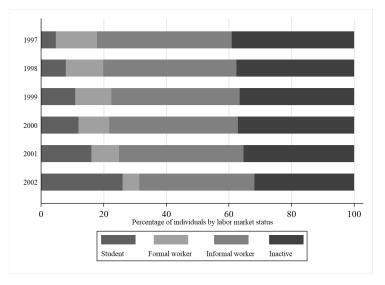
20010 27 20001	TP CT C D COUCLES	100		
Variable	Mean	SD	Min	Max
Individual characteristics				
Female	0.39	0.49	0	1
Age	20.88	1.51	16	24
Language test score	-0.06	0.97	-2.84	3.53
Math test score	-0.04	0.97	-2.69	3.40
School characteristics				
Hours of English instruction	0.23	0.60	0	9.41
English teachers	0.02	0.05	0	1
Number of students (6th grade)	28.87	9.49	1	119
Number of teachers with college	0.87	0.20	0	2.15
Number of teachers with masters	0.05	0.07	0	0.91
Rural (%)	0.27	0.44	0	1
Labor market characteristics				
Wage (monthly pesos)	6,586	3,383	2,510	67,215
Permanent job	0.81	0.39	0	1
Number of jobs (in a year)	1.48	0.83	1	17
Number of permanent jobs	1.20	0.83	0	14
Company size (workers)	1,922	5,456	1	92,972
Distance home-work (km)	107	265	0	2,029
Observations	4,055,434			

Potential problem: many 16-24 year olds are enrolled in school (2020 Mexican census) • Back





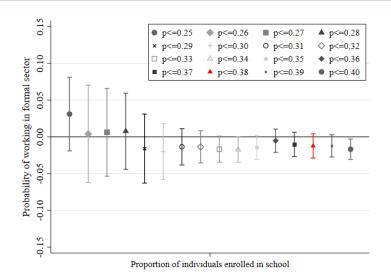
Statuses with low-enrollment sample







How I chose the 38 percent enrollment rate?



High-English intensive manufacturing industries

Table A.6: Economic Manufacturing Industries

4-digit	Industry name	5-digit	Industry name
code		code	
3110	Animal food manufacturing	31131	Sugar and confectionery product manufacturing
		31141	Fruit and vegetable preserving manufacturing
		31151	Dairy product manufacturing
		31161	Animal slaughtering and processing
3120	Beverage and tobacco industries	31211	Beverage manufacturing
3150	Apparel manufacturing	31511	Apparel knitting mills
		31521	Cut and sew apparel manufacturing
3160	Leather and hide tanning and	31611	Leather and hide tanning and finishing
	finishing	31621	Footwear manufacturing
3220	Paper industry	32211	Pulp, paper, and paperboard mills
3250	Chemical industry	32511	Basic chemical manufacturing
		32521	Resin, synthetic rubber, and artificial and synthetic fibers
		32541	Pharmaceutical and medicine manufacturing
		32551	Paint, coating, and adhesive manufacturing
		32591	Other chemical product and preparation manufacturing
3270	Nonmetallic mineral products	32711	Clay product and refractory manufacturing
		32731	Cement and concrete product manufacturing
3320	Metal products manufacturing	33241	Boiler, tank, and shipping container manufacturing
		33251	Hardware manufacturing
		33281	Coating, engraving, heat treating, and allied activities
3340	Manufacturing of computer	33461	Manufacturing and reproducing magnetic and optical media
3350	Electric appliances and electric	33511	Electric lighting equipment manufacturing
	power generation	33521	Household appliance manufacturing
		33531	Electrical equipment manufacturing
3360	Transportation equipment	33611	Motor vehicle manufacturing
		33641	Aerospace product and parts manufacturing
		33651	Railroad rolling stock manufacturing
		33661	Ship and boat building
3370	Household furniture	33710	Nonupholstered wood household furniture manufacturing





Services that require English abilities

Table A.7: Economic Services Industries

4-digit	Industry name	5-digit	Industry name
code		code	
4310	Wholesale trade of groceries, food,	43111	Grocery merchant wholesalers
	beverages and tobacco	43112	Tobacco and alcoholic beverage merchant wholesalers
4350	Wholesale trade of industrial machinery	43522	Wholesale trade of manufacturing machinery and equipment
	and equipment	43541	Computer and software merchant wholesalers
4620	Retail trade in self-service shops and	46211	Retail trade in self-service shops
	department stores	46221	Retail trade in department stores
4641	Retail trade of health care items	46412	Optical goods and other health care stores
4651	Retail trade of perfumery and jewelry	46511	Cosmetics, beauty supplies, and perfume stores
4661	Retail trade of household furniture	46611	Furniture stores
4682	Automotive parts and accessories	46821	Automotive parts, accessories, and tire stores
4841	Freight truck transportation	48410	General freight trucking
4931	Warehousing services	49310	Warehousing and storage
5170	Telecommunications	51731	Wired and wireless telecommunications carriers
5324	Commercial and industrial machinery	53242	Office machinery and equipment rental and leasing
5610	Administrative and support services	56160	Investigation and security services
		56170	Services to buildings and dwellings
7100	Artistic, cultural and sporting services	71121	Spectator sports
		71311	Amusement parks and arcades
7211	Traveler accommodation	72111	Hotels and motels
7223	Special food services	72231	Food and beverage preparation services
7224	Drinking places (alcoholic beverages)	72241	Nightclubs, bars and similar drinking places
8114	Personal and household goods repair	81140	Personal and household goods repair and maintenance
8131	Religious organizations	81311	Religious organizations
9314	Justice, public order, and safety	93141	Justice, public order, and safety activities

▶ Back



Industries	NAICS code	Industry Title
Agriculture	11	Agriculture, Forestry, Fishing and Hunting
	21	Mining
Construction	22	Utilities
	23	Construction
Manufacturing	31-33	Manufacturing
	42	Wholesale Trade
	44-45	Retail Trade
	48-49	Transportation and Warehousing
	51	Information
	52	Finance and Insurance
	53	Real Estate Rental and Leasing
	54	Professional, Scientific, and Technical Services
Services	55	Management of Companies and Enterprises
	56	Administrative and Support and Waste Management
	61	Educational Services
	62	Health Care and Social Assistance
	71	Arts, Entertainment, and Recreation
	72	Accommodation and Food Services
	81	Other Services (except Public Administration)
	92	Public Administration



Data: Student achievement

- I look at test scores as one of the mechanisms
- ② I standardize test scores, ts_{isct} , of each student i in school s at time t using the following formula:

$$test_score_{isc} = \frac{ts_{isct} - \mu_t}{\sigma_t}$$

where $test_score_{isc}$ is the standardized test score, while μ_t and σ_t are the mean and standard deviation of test scores, respectively, pooling all Mexican students by grade and by each observed year





Estimation results: exposure to Eng and test scores

Table 7: Exposure to English instruction and student achievement

	(1)	(2)	(3)	(4)		
	Language 6th	Language 6th	Math 6th	Math 6th		
Panel A: Full sample in ENLACE database						
Hrs English	0.0335***	0.0099*	0.0155***	-0.0081		
	(0.0033)	(0.0054)	(0.0036)	(0.0062)		
Observations	16,938,183	16,938,183	16,938,183	16,938,183		
Adjusted \mathbb{R}^2	0.426	0.472	0.429	0.482		
Panel B: Full sample	le in Social Secu	rity data				
Hrs English	0.0284***	-0.0015	0.0105***	-0.0225***		
	(0.0033)	(0.0075)	(0.0037)	(0.0086)		
Observations	4,055,434	4,055,434	4,055,434	4,055,434		
Adjusted \mathbb{R}^2	0.404	0.453	0.413	0.470		

➤ Robustness checks

➤ Test scores

→ Wages



Table 2: Exposure to English instruction and labor market outcomes (Social Security data)

	(1)	(2)	(3)	(4)
	Formal	ln(wage)	ln(distance)	Move
	sector			state
Panel C: Low enrolls	nent sample	e (Men)		
Hrs English (β^M)	-0.016	-0.002	-0.130**	0.004
	(0.011)	(0.016)	(0.057)	(0.012)
Observations	750,812	166,165	166,165	166,165
Adjusted R^2	0.149	0.315	0.680	0.729
Panel D: Low enrolls	ment sample	e (Women)		
Hrs English (β^W)	-0.010	-0.022	0.063*	0.033**
	(0.010)	(0.015)	(0.034)	(0.012)
Observations	804,015	93,501	93,501	93,501
Adjusted R^2	0.107	0.363	0.700	0.756
$\beta^M = \beta^W$ [p-value]	[0.012]	[0.448]	[0.190]	[0.090]
State of work FE	NO	YES	YES	YES





Table 3: Exposure to English instruction and labor market outcomes by abilities

(Social Security data)				
	(1)	(2)	(3)	(4)
	Formal	ln(wage)	ln(distance)	Move
	sector			state
Panel B: Low en	rollment sam	ple (Men)		
Hrs English	-0.014	-0.010	-0.145**	0.008
	(0.012)	(0.018)	(0.064)	(0.014)
$Eng \times Q2$	0.007	-0.001	-0.023	-0.005
	(0.009)	(0.011)	(0.060)	(0.010)
$Eng \times Q3$	-0.006	0.040***	0.008	-0.014
	(0.011)	(0.014)	(0.049)	(0.012)
$Eng \times Q4$	-0.013	0.010	0.104*	-0.001
	(0.011)	(0.017)	(0.058)	(0.014)
Observations	750,812	166,165	166,165	166,165
Adjusted R^2	0.149	0.315	0.680	0.729
Panel C: Low en	rollment sam	ple (Wome	en)	
Hrs English	-0.007	-0.030*	0.029	0.042**
	(0.010)	(0.016)	(0.084)	(0.017)
$Eng \times Q2$	-0.006	-0.007	-0.002	-0.024**
	(0.007)	(0.012)	(0.065)	(0.012)
$Eng \times Q3$	-0.000	0.017*	0.017	-0.020
	(0.006)	(0.010)	(0.087)	(0.017)
$Eng \times Q4$	-0.008	0.017	0.109	0.004
	(0.007)	(0.017)	(0.080)	(0.019)
Observations	804,015	93,501	93,501	93,501
Adjusted R^2	0.107	0.363	0.701	0.756

Table 4: Exposure to English instruction and economic industries (Social Security data)

	(1)	(2)	(3)	(4)		
	Agri-	Con-	Manu-	Serv-		
	culture	struction	facturing	ices		
Panel C: Low enrollment sample (Men)						
Hrs English (β^M)	-0.005	-0.026*	0.040**	-0.010		
	(0.008)	(0.014)	(0.020)	(0.020)		
Observations	166,165	166,165	166,165	166,165		
Adjusted R^2	0.424	0.424	0.352	0.273		
Panel D: Low enroll	ment samp	le (Women)				
Hrs English (β^W)	-0.024***	-0.006	0.043**	-0.012		
	(0.008)	(0.006)	(0.021)	(0.024)		
Observations	93,501	93,501	93,501	93,501		
Adjusted R^2	0.446	0.139	0.383	0.383		
$\beta^M = \beta^W$ [p-value]	[0.055]	[0.000]	[0.003]	[0.974]		
Shares	0.04	0.08	0.35	0.53		





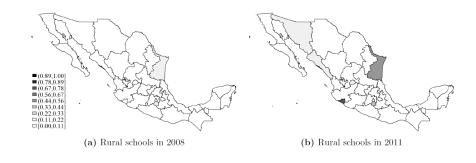
Table 6: Exposure to English instruction and economic industries (Social Security data)

	(1)	(2)	(3)	(4)
	Manufa	cturing	Ser	vices
	High	Low	High	Low
	English	English	English	English
Panel C: Low enrolls	ment sampl	le (Men)		
Hrs English (β^M)	0.075***	-0.035**	0.033**	-0.035**
	(0.016)	(0.016)	(0.015)	(0.014)
Observations	166,165	166,165	166,165	166,165
Adjusted R^2	0.175	0.202	0.163	0.111
Panel D: Low enrolls	ment samp	le (Women)		
Hrs English (β^W)	0.038*	-0.011	0.047^*	-0.039*
	(0.020)	(0.018)	(0.027)	(0.023)
Observations	93,501	93,501	93,501	93,501
Adjusted R^2	0.226	0.229	0.191	0.173
$\beta^M = \beta^W$ [p-value]	[0.058]	[0.070]	[0.454]	[0.594]
Shares	0.17	0.17	0.29	0.24

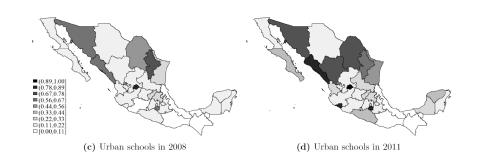




Proportion of **rural** schools with English instruction (2008 vs 2011)



Proportion of **urban** schools with English instruction (2008 vs 2011)





English instruction and industries by abilities

Table 5: Exposure to English instruction and economic industries by abilities

(Social Security data)

	(BOCIAL L	security data	ı)	
	(1)	(2)	(3)	(4)
	Agri-	Con-	Manu-	Serv-
	$\operatorname{culture}$	struction	facture	ices
Panel A: Low	enrollment	t $sample$		
Hrs English	-0.005	-0.035***	0.049***	-0.008
	(0.007)	(0.010)	(0.018)	(0.018)
$Eng \times Q2$	-0.014***	0.006	-0.010	0.017
	(0.004)	(0.005)	(0.011)	(0.011)
$Eng \times Q3$	-0.011*	0.020***	-0.008	-0.001
	(0.006)	(0.006)	(0.012)	(0.012)
$Eng \times Q4$	-0.005	0.022***	-0.022*	0.004
	(0.006)	(0.007)	(0.013)	(0.010)
Observations	259,666	259,666	259,666	259,666
Adjusted \mathbb{R}^2	0.402	0.388	0.342	0.292







Industries requiring English skills by abilities

Table A.2: Exposure to English instruction and economic industries by abilities (Social Security data)

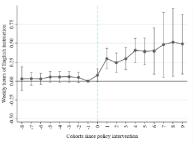
	(1)	(2)	(3)	(4)		
	Manufa	cturing	S	ervices		
	High	Low	High	Low		
	English	English	Englis	h English		
Panel A: Low enrollment sample						
Hrs English	0.065***	-0.020	0.040**	-0.037***		
	(0.014)	(0.015)	(0.015)	(0.012)		
$Eng \times Q2$	0.001	-0.012	0.021*	-0.005		
	(0.009)	(0.010)	(0.011)	(0.008)		
$Eng \times Q3$	-0.007	0.000	0.001	-0.003		
	(0.011)	(0.011)	(0.010)	(0.007)		
$Eng \times Q4$	-0.012	-0.014	0.004	0.000		
	(0.011)	(0.014)	(0.009)	(0.008)		
Observations	259,666	259,666	259,66	6 259,666		
Adjusted \mathbb{R}^2	0.175	0.189	0.145	0.116		



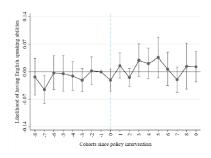


Mechanism 1a: English abilities (Galvez-Soriano, 2023)

$$y_{isc} = \theta + \sum_{c} \psi_{c} \cdot I_{(treatment_{sc} = c - c_{s}^{*})} + \delta_{s} + \kappa_{c} + X_{isc} \Psi + \varepsilon_{isc}$$



(a) Hours of English



(b) Speak English





TWFE correction (Callaway, Goodman-Bacon and Sant'Anna (2021))

Table 8: Solutions for TWFE with heterogeneous treatment effects (Social Security data)

	(1)	(2)	(3)	(4)			
	Formal	ln(wage)	ln(distance)	Move			
	sector			state			
Panel A: Binary treatment							
Eng	-0.009	0.000	-0.020	0.014*			
	(0.006)	(0.011)	(0.042)	(0.008)			
Observations	1,554,827	259,666	259,666	259,666			
Adjusted \mathbb{R}^2	0.125	0.292	0.675	0.726			
Panel B: Bind	iry treatmen	nt w/o alwa	ys treated				
Eng	-0.011*	0.002	-0.016	0.016*			
	(0.006)	(0.011)	(0.043)	(0.009)			
Observations	1,531,834	254,287	254,287	254,287			
Adjusted \mathbb{R}^2	0.125	0.292	0.675	0.726			





Differential cohorts trends across labor markets?

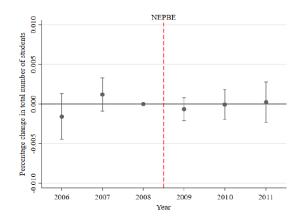
Table 10: Exposure to English instruction and labor market outcomes (with state-by-cohort FE, Social Security data)

1						
	(1)	(2)	(3)	(4)		
	Formal	ln(wage)	ln(distance)	Move		
	sector			state		
Panel B: Low enrollment sample						
Hrs English	-0.007	0.008	-0.045	0.012		
	(0.010)	(0.013)	(0.051)	(0.010)		
Observations	1,554,827	259,666	259,666	259,666		
Adjusted \mathbb{R}^2	0.124	0.313	0.677	0.728		

→ Back



No-changes in private school enrollment







Different exposure variable

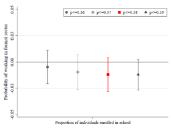
Table 9: English instruction and labor market outcomes (Alternative exposure variable)

	(1)	(2)	(3)	(4)		
	Formal	$\ln(\text{wage})$	ln(distance)	Move		
	sector			state		
Panel B: Low enrollment sample						
Eng Teachers	-0.202*	-0.127	-0.772	0.072*		
	(0.120)	(0.196)	(0.751)	(0.040)		
Observations	1,554,827	259,666	259,666	259,666		
Adjusted R^2	0.123	0.312	0.677	0.727		

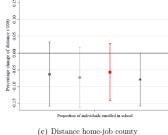


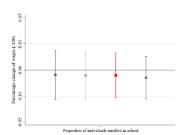


Solution to sample selection > Back

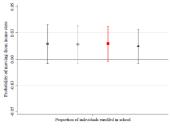








(b) Ln(monthly wage)

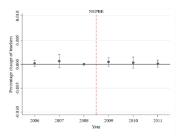


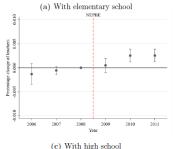
(d) Moves from home county

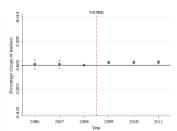


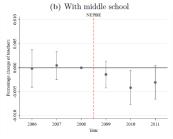


More teachers? • Back











- Increase in mobility is driven by women > Labor mkt
 - Women move away from rural areas "Industries"
- Positive effect on wages is driven by men High achieving
 - High achieving men substitute proportionally more agricultural than construction jobs for manufacturing ones
 Abilities



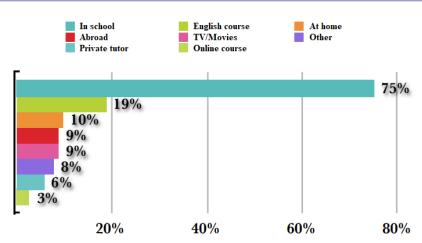
The social security data has a monthly frequency, and each month could have more than one observation for the same worker because some workers have more than one job

- I take the average of the wages reported over one year, by worker, by economic sector and by employer
- When a worker has multiple jobs, I drop the jobs with the lowest wages if those are non-permanent jobs
- If there are individuals with permanent and non-permanent jobs, I only use permanent jobs
- For individuals who have more than one job with the same wage I choose the job in which they have worked most part of the year

I assume that an employee works 30 days, on average



Where did you learn English? • Back



Note: This question was answered only by individuals who reported having English abilities. The answers are independent, i.e. do not sum 100 percent.

Source: CIDAC (2008). Encuesta CIDAC sobre Capital Humano en México. México.

