

Impact of English instruction on labor market outcomes

The case of Mexico

Oscar Galvez-Soriano,¹ Alejandrina Salcedo-Cisneros,²
Francisco Cabrera-Hernandez³

¹University of Houston

²Banco de México

³CIDE

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Related literature

Most related to:

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

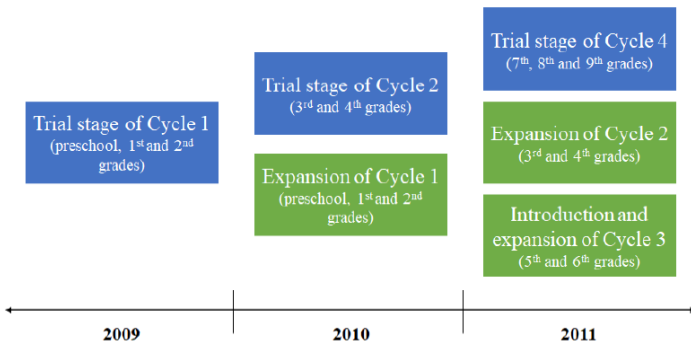
I study English instruction as a subject in Mexican public primary schools

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

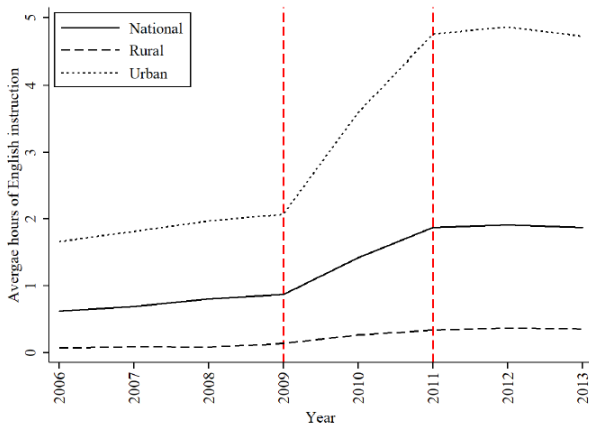
Policy background: English program stages



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.

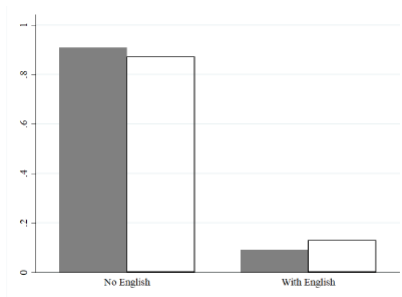
►► Exposure

Policy background: English instruction over time

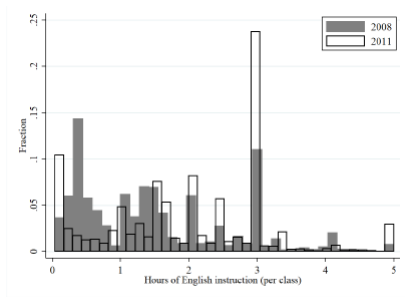


Source: Own elaboration with data from the Mexican school census, Ministry of Public Education (SEP).
Note: Hours of English instruction are measured as the weekly hours average over the universe of Mexican elementary schools. Similarly, the number of English teachers refers to the average number of 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) Proportion of schools with English



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

▶▶ Hours of Eng

►► 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 (multinational firms, tourism, professional jobs)
 - Potential heterogeneity in effect by cognitive skills
- Other skills
 - Reduces time on other subjects or school activities
 - Possible complementarities with other subjects

Empirical strategy

- 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

►► Stages

| Birth cohort | Primary school | | | | | |
|--------------|----------------|------|------|------|------|------|
| | 1st | 2nd | 3rd | 4th | 5th | 6th |
| 1997 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
| 1998 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| 1999 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| 2000 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
| 2001 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
| 2002 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |

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Allowing for heterogeneity in effect by cognitive skills

Now, I allow the effect of exposure to vary by cognitive skills:

$$y_{isct} = \alpha + \beta \cdot ExpEng_{sc} + \sum_{j=2}^4 \psi_j \cdot (ExpEng_{sc} \times Q_j) \\ + \sum_{j=2}^4 \pi_j \cdot Q_j + \mathbf{X}_{isct} \boldsymbol{\gamma} + \zeta_c + \nu_s + \tau_t + \varepsilon_{isct}$$

where Q_j are the dummy variables for cognitive skills quartiles with $j = \{2, 3, 4\}$; Q_1 is the reference category

Data

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:

- 1 Works in formal sector
 - Dummy for being in Social Security data among the universe of students
- 2 Wages (average monthly wage) » IMSS
- 3 Geographical mobility
 - Distance from home to working municipality
 - Moving from home state
- 4 Industries (NAICS) » codes
 - Dummies for agriculture, construction, manufacturing and services industries

Initial estimation results

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

| | (1) | (2) | (3) | (4) |
|-----------------------------|----------------------|----------------------|----------------------|----------------------|
| | Formal sector | ln(wage) | ln(distance) | Move state |
| <i>Panel A: Full sample</i> | | | | |
| Hrs English | -0.013*** (0.001) | -0.015*** (0.002) | -0.035*** (0.008) | -0.004*** (0.001) |
| Observations | 16,938,183 | 4,055,434 | 4,055,434 | 4,055,434 |
| Adjusted R^2 | 0.105 | 0.270 | 0.477 | 0.555 |

- Concern about selection into social security data
 - Consistent with exposure to English instruction increasing school enrollment [▶ Census](#)
- Use municipalities where it is less likely that they are enrolled

[▶ Statuses](#)
[▶ Test scores](#)

Proposed solution: Construction of low-enrollment sample

- 1 Using the 2020 Mexican Population Census, I construct a municipality-enrollment rate variable for 18 years old (2002 birth cohort)
- 2 I limit my sample to the municipalities with the lowest enrollment rates
- 3 The low-enrollment sample represents 6.4% of the full sample

►► Statuses

►► How?

Labor market outcomes with low-enrollment sample

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

| | (1) | (2) | (3) | (4) |
|---------------------------------------|-------------------|-------------------|-------------------|--------------------|
| | Formal sector | ln(wage) | ln(distance) | Move state |
| <i>Panel B: Low enrollment sample</i> | | | | |
| Hrs English | -0.012 (0.008) | -0.005 (0.011) | -0.058 (0.044) | 0.015** (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 |

Labor market outcomes with low-enrollment sample

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Summary of results so far

- Looking at individuals 16-24 year old, I find that more exposure to English instruction makes them less likely to work in formal labor
- I use a low-enrollment sample that deals with selection into formal sector
 - No average effect on wages
 - Increase in mobility
 - Shifts across industries
- Do effects vary by cognitive abilities?

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

$$y_{isct} = \alpha + \beta \cdot ExpEng_{sc} + \sum_{j=2}^4 \psi_j \cdot (ExpEng_{sc} \times Q_j) \\ + \sum_{j=2}^4 \pi_j \cdot Q_j + \mathbf{X}_{isct} \boldsymbol{\gamma} + \zeta_c + \nu_s + \tau_t + \varepsilon_{isct}$$

» Distribution

Labor market outcomes by cognitive abilities

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

| | (1) | (2) | (3) | (4) |
|---------------------------------------|---------------------|---------------------|---------------------|--------------------|
| | Formal sector | ln(wage) | ln(distance) | Move state |
| <i>Panel A: Low enrollment sample</i> | | | | |
| Hrs English | -0.007 (0.009) | -0.013 (0.012) | -0.079 (0.049) | 0.021** (0.010) |
| Eng×Q2 | -0.003 (0.006) | -0.003 (0.009) | -0.018 (0.047) | -0.011 (0.008) |
| Eng×Q3 | -0.005 (0.006) | 0.031*** (0.009) | 0.012 (0.036) | -0.017 (0.011) |
| Eng×Q4 | -0.013** (0.006) | 0.012 (0.012) | 0.106*** (0.040) | 0.001 (0.012) |
| Observations | 1,554,827 | 259,666 | 259,666 | 259,666 |
| Adjusted 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.

Labor market outcomes by cognitive abilities

Table 3: Exposure to English instruction and labor market outcomes by abilities
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| | (1) | (2) | (3) | (4) |
|---------------------------------------|---------------------|---------------------|---------------------|--------------------|
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| Hrs English | -0.007 (0.009) | -0.013 (0.012) | -0.079 (0.049) | 0.021** (0.010) |
| Eng×Q2 | -0.003 (0.006) | -0.003 (0.009) | -0.018 (0.047) | -0.011 (0.008) |
| Eng×Q3 | -0.005 (0.006) | 0.031*** (0.009) | 0.012 (0.036) | -0.017 (0.011) |
| Eng×Q4 | -0.013** (0.006) | 0.012 (0.012) | 0.106*** (0.040) | 0.001 (0.012) |
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Labor market outcomes by cognitive abilities

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

| | | (1) | (2) | (3) | (4) |
|---------------------------------------|----------------|---------------------|---------------------|---------------------|--------------------|
| | | Formal sector | ln(wage) | ln(distance) | Move state |
| <i>Panel A: Low enrollment sample</i> | | | | | |
| High-achieving individuals | Hrs English | -0.007 (0.009) | -0.013 (0.012) | -0.079 (0.049) | 0.021** (0.010) |
| | Eng×Q2 | -0.003 (0.006) | -0.003 (0.009) | -0.018 (0.047) | -0.011 (0.008) |
| | Eng×Q3 | -0.005 (0.006) | 0.031*** (0.009) | 0.012 (0.036) | -0.017 (0.011) |
| | Eng×Q4 | -0.013** (0.006) | 0.012 (0.012) | 0.106*** (0.040) | 0.001 (0.012) |
| | Observations | 1,554,827 | 259,666 | 259,666 | 259,666 |
| | Adjusted 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 industries by abilities

Table 5: Exposure to English instruction and economic industries by abilities
(Social Security data)

| | | (1) | (2) | (3) | (4) |
|---------------------------------------|----------------|----------------------|----------------------|---------------------|-------------------|
| | | Agri- culture | Con- struction | Manu- facture | Serv- ices |
| <i>Panel A: Low enrollment sample</i> | | | | | |
| Low-achieving | Hrs English | -0.005 (0.007) | -0.035*** (0.010) | 0.049*** (0.018) | -0.008 (0.018) |
| | Eng×Q2 | -0.014*** (0.004) | 0.006 (0.005) | -0.010 (0.011) | 0.017 (0.011) |
| High-achieving | Eng×Q3 | -0.011* (0.006) | 0.020*** (0.006) | -0.008 (0.012) | -0.001 (0.012) |
| | Eng×Q4 | -0.005 (0.006) | 0.022*** (0.007) | -0.022* (0.013) | 0.004 (0.010) |
| | Observations | 259,666 | 259,666 | 259,666 | 259,666 |
| | Adjusted R^2 | 0.402 | 0.388 | 0.342 | 0.292 |

Summary of results by abilities

- Exposure to English instruction increases wages of high-ability workers
- Exposure to English instruction increases mobility of low-ability workers
- All ability groups show shifts across industries

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:
 - a Galvez-Soriano (2023) shows that exposure to English instruction in primary school increases the probability of speaking English
 - b Workers are systematically moving to economic industries requiring English abilities
- Mechanism 2: Other cognitive abilities
 - Language (Spanish)
 - Mathematics

Mechanism 2: Other cognitive abilities

Effect of exposure to English instruction on student achievement:

$$test_score_{isc} = \theta + \phi \cdot ExpEng_{sc} + \mathbf{X}_{isc}\boldsymbol{\gamma} + \zeta_c + \nu_s + \varepsilon_{isc}$$

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

» Data

Mechanism 2: Other cognitive abilities

[▶ Full sample](#)

Table 7: Exposure to English instruction
and student achievement

| | (1) | (2) |
|------------------------------|--------------------|--------------------|
| | Language 6th | Math 6th |
| <i>Low enrollment sample</i> | | |
| Hrs English | 0.0476 (0.0470) | 0.0094 (0.0344) |
| Observations | 259,666 | 259,666 |
| Adjusted R^2 | 0.351 | 0.381 |

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:
 - a Galvez-Soriano (2023) shows that exposure to English instruction in primary school increases the probability of speaking English
 - b Workers are systematically moving to economic industries requiring English abilities
- ~~Mechanism 2: Other cognitive abilities~~
 - ~~Language (Spanish)~~
 - ~~Mathematics~~

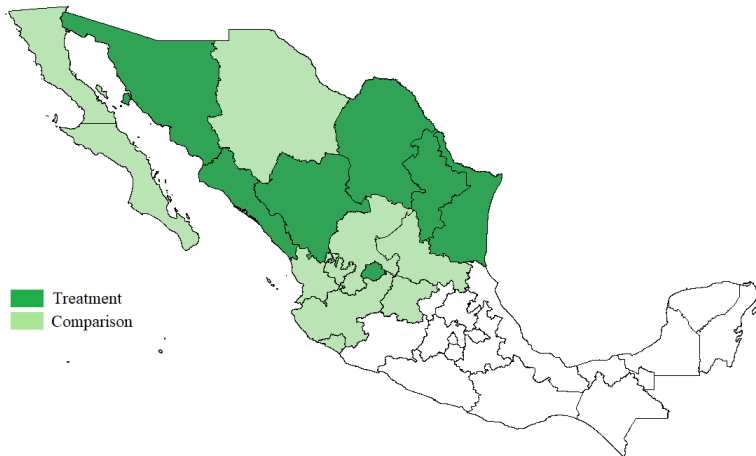
- I use the 2014 Subjective Well-being Survey (BIARE)
- Representative at national and state level
- Asks if the respondent speaks English
- Only 3% reported they speak English

Take advantage of state policy changes in English instruction

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

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)

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



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()

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

Table: Intention to Treat effect of offering
English instruction at school

| | (1) | (2) |
|-----------------------------|---------------------|--------------------|
| | Hrs | Speak |
| | Eng | Eng |
| <i>Panel A: Full sample</i> | | |
| Had Policy | 0.308*** (0.046) | 0.015** (0.008) |
| Observations | 13,131 | 13,131 |
| Adjusted 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 the following dummies reflecting English-intensive jobs
 - Dummy for individuals having a job in top-quartile of English speakers distribution
 - Dummy for individuals having a job in bottom-three-quartiles of English speakers distribution

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 | | Services | |
| | High English | Low English | High English | Low English |
| <i>Panel B: Low enrollment sample</i> | | | | |
| Hrs English | 0.060*** (0.013) | -0.026** (0.012) | 0.046*** (0.014) | -0.039*** (0.011) |
| Observations | 259,666 | 259,666 | 259,666 | 259,666 |
| Adjusted R^2 | 0.175 | 0.189 | 0.145 | 0.116 |

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

Conclusion

[» Next steps](#)

- I exploit a policy change and construct a novel database to estimate the causal effect of English instruction
- Exposure to English instruction affects outcomes of workers across the cognitive skills distribution
 - On average: no effect on wages, increase in mobility and shifts across industries
 - High-skill workers: rise in wages, industry shifts
 - Low-skill workers: increase in mobility, industry shifts
- Consistent with English skills mediating these effects
- In Mexico, having second language skills (English) expands individual's labor market opportunities

Thank you!

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



Next steps

[▶ Back](#)

- These findings are for individuals who stay in Mexico
 - Currently, I am examining effect on migration to US
- In a companion paper, using a different data set (BIARE), I estimate the effect of having English skills on labor market outcomes
 - Preliminary evidence is consistent with my findings here:
English skills do not raise wages, on average, but do affect labor choices

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 |

►► Eng over time

▶▶ Exposure

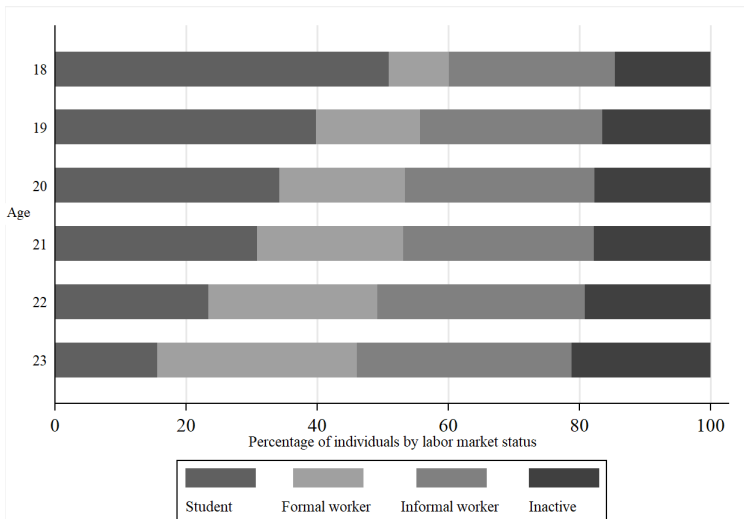
►► Distribution

Descriptive statistics (matched data sets)

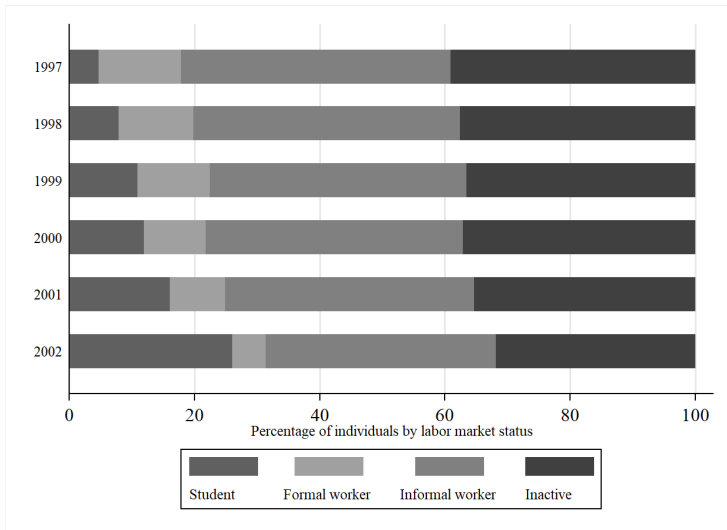
Table 1: Descriptive statistics

| Variable | Mean | SD | Min | Max |
|-------------------------------------|-----------|-------|-------|--------|
| <i>Individual characteristics</i> | | | | |
| 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 |
| <i>School characteristics</i> | | | | |
| 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 |
| <i>Labor market characteristics</i> | | | | |
| 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



| 4-digit code | Industry name | 5-digit code | Industry name |
|--------------|---|--------------|--|
| 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 finishing | 31611 | Leather and hide tanning and 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 power generation | 33511 | Electric lighting equipment manufacturing |
| | | 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 |

| 4-digit code | Industry name | 5-digit code | Industry name |
|--------------|---|--------------|--|
| 4310 | Wholesale trade of groceries, food, beverages and tobacco | 43111 | Grocery merchant wholesalers |
| | | 43112 | Tobacco and alcoholic beverage merchant wholesalers |
| 4350 | Wholesale trade of industrial machinery and equipment | 43522 | Wholesale trade of manufacturing machinery and equipment |
| | | 43541 | Computer and software merchant wholesalers |
| 4620 | Retail trade in self-service shops and department stores | 46211 | Retail trade in self-service shops |
| | | 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 |

NAICS codes in my classification

| Industries | NAICS code | Industry Title |
|---------------|------------|--|
| Agriculture | 11 | Agriculture, Forestry, Fishing and Hunting |
| Construction | 21 | Mining |
| | 22 | Utilities |
| | 23 | Construction |
| Manufacturing | 31-33 | Manufacturing |
| Services | 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 |
| | 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

- 1 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

» Back

Gender heterogeneous effects

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

| | (1) | (2) | (3) | (4) |
|---|-------------------|-------------------|---------------------|--------------------|
| | Formal sector | ln(wage) | ln(distance) | Move state |
| <i>Panel C: Low enrollment sample (Men)</i> | | | | |
| Hrs English (β^M) | -0.016 (0.011) | -0.002 (0.016) | -0.130** (0.057) | 0.004 (0.012) |
| Observations | 750,812 | 166,165 | 166,165 | 166,165 |
| Adjusted R^2 | 0.149 | 0.315 | 0.680 | 0.729 |
| <i>Panel D: Low enrollment sample (Women)</i> | | | | |
| Hrs English (β^W) | -0.010 (0.010) | -0.022 (0.015) | 0.063* (0.034) | 0.033** (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 |

| | | | |
|-----|-----|-----|-----|
| (1) | (0) | (0) | (1) |
|-----|-----|-----|-----|

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

Gender heterogeneous effects

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

| | (1) Agri- culture | (2) Con- struction | (3) Manu- facturing | (4) Serv- ices |
|---|-------------------------|--------------------------|---------------------------|----------------------|
| <i>Panel C: Low enrollment sample (Men)</i> | | | | |
| Hrs English (β^M) | -0.005 (0.008) | -0.026* (0.014) | 0.040** (0.020) | -0.010 (0.020) |
| Observations | 166,165 | 166,165 | 166,165 | 166,165 |
| Adjusted R^2 | 0.424 | 0.424 | 0.352 | 0.273 |
| <i>Panel D: Low enrollment sample (Women)</i> | | | | |
| Hrs English (β^W) | -0.024*** (0.008) | -0.006 (0.006) | 0.043** (0.021) | -0.012 (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 |

Gender heterogeneous effects

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

| | (1) | (2) | (3) | (4) |
|---|---------------------|---------------------|--------------------|---------------------|
| | Manufacturing | | Services | |
| | High English | Low English | High English | Low English |
| <i>Panel C: Low enrollment sample (Men)</i> | | | | |
| Hrs English (β^M) | 0.075*** (0.016) | -0.035** (0.016) | 0.033** (0.015) | -0.035** (0.014) |
| Observations | 166,165 | 166,165 | 166,165 | 166,165 |
| Adjusted R^2 | 0.175 | 0.202 | 0.163 | 0.111 |
| <i>Panel D: Low enrollment sample (Women)</i> | | | | |
| Hrs English (β^W) | 0.038* (0.020) | -0.011 (0.018) | 0.047* (0.027) | -0.039* (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)



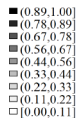
(a) Rural schools in 2008



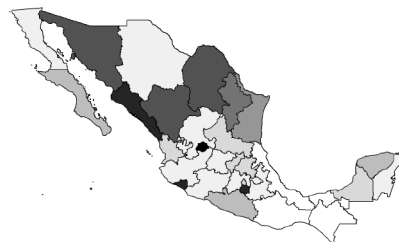
(b) Rural schools in 2011

►► Back

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



(c) Urban schools in 2008



(d) Urban schools in 2011

►► Back

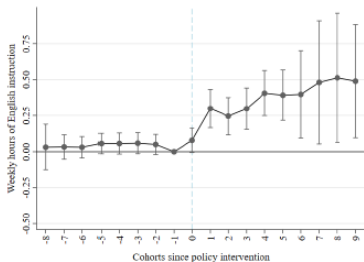
Industries requiring English skills by abilities

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

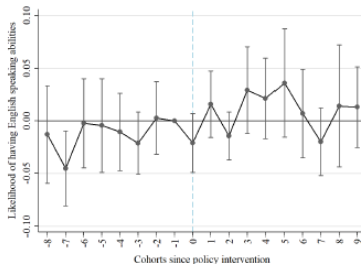
| | | (1) | (2) | (3) | (4) |
|----------------|---------------------------------------|---------------------|-------------------|---------------------|----------------------|
| | | Manufacturing | | Services | |
| | | High English | Low English | High English | Low English |
| Low-achieving | <i>Panel A: Low enrollment sample</i> | | | | |
| | Hrs English | 0.065*** (0.014) | -0.020 (0.015) | 0.040*** (0.015) | -0.037*** (0.012) |
| | Eng×Q2 | 0.001 (0.009) | -0.012 (0.010) | 0.021* (0.011) | -0.005 (0.008) |
| | Eng×Q3 | -0.007 (0.011) | 0.000 (0.011) | 0.001 (0.010) | -0.003 (0.007) |
| | Eng×Q4 | -0.012 (0.011) | -0.014 (0.014) | 0.004 (0.009) | 0.000 (0.008) |
| High-achieving | Observations | 259,666 | 259,666 | 259,666 | 259,666 |
| | Adjusted R^2 | 0.175 | 0.189 | 0.145 | 0.116 |

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

$$y_{isc} = \theta + \sum_c \psi_c \cdot I_{(treatment_{sc}=c-c_s^*)} + \delta_s + \kappa_c + \mathbf{X}_{isc}\Psi + \varepsilon_{isc}$$



(a) Hours of English



(b) Speak English

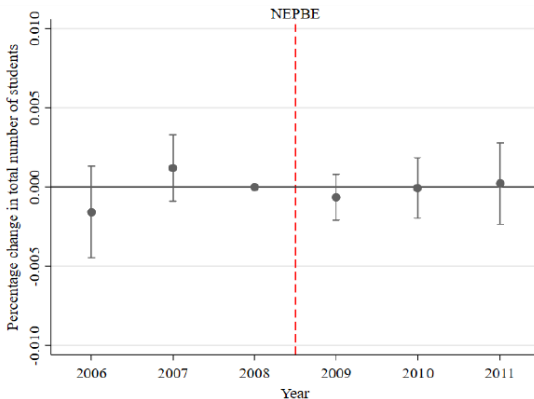
Differential cohorts trends across labor markets?

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

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

[» Back](#)
[» Women](#)

No-changes in private school enrollment

[» Back](#)

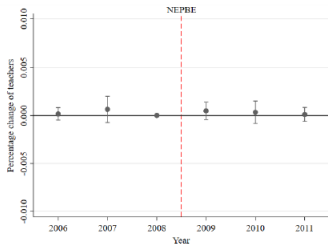
Different exposure variable

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

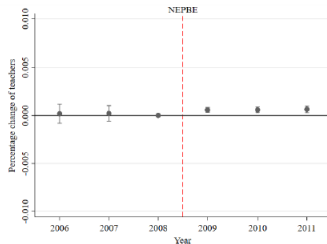
| | (1) | (2) | (3) | (4) |
|---------------------------------------|--------------------|-------------------|-------------------|-------------------|
| | Formal sector | ln(wage) | ln(distance) | Move state |
| <i>Panel B: Low enrollment sample</i> | | | | |
| Eng Teachers | -0.202* (0.120) | -0.127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

» Back

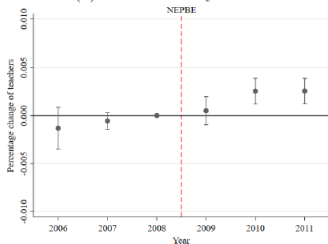
More teachers? [» Back](#)



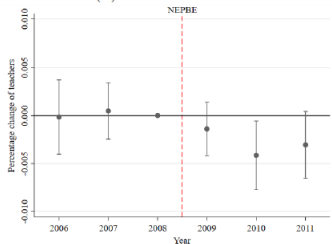
(a) With elementary school



(b) With middle school



(c) With high school



(d) With college degree

Gender heterogeneous effects

- 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

Examining labor market statuses using Mexican census

- Estimate effect of policy exposure on labor market statuses
- Modify empirical strategy using municipality FE (do not have school ID)

Table : English instruction (Mexican census data)

| | (1) Student | (2) Formal sector | (3) Informal sector | (4) Inactive |
|----------------|---------------------|-------------------------|---------------------------|------------------|
| Hrs English | 0.059*** (0.008) | -0.058*** (0.008) | -0.008 (0.005) | 0.006 (0.006) |
| Observations | 1,415,827 | 1,415,827 | 1,415,827 | 1,415,827 |
| Adjusted R^2 | 0.111 | 0.109 | 0.083 | 0.111 |

► Back

►► Back



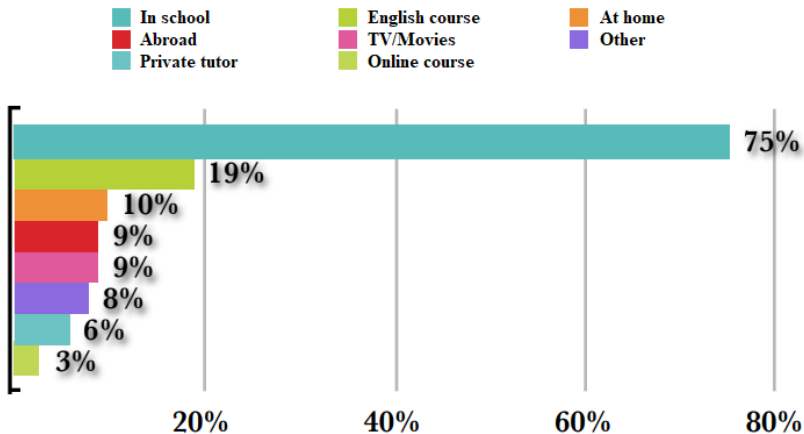
►► Back

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

- ① I take the average of the wages reported over one year, by worker, by economic sector and by employer
- ② When a worker has multiple jobs, I drop the jobs with the lowest wages if those are non-permanent jobs
- ③ If there are individuals with permanent and non-permanent jobs, I only use permanent jobs
- ④ 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.