Age at Arrival, English Proficiency, and Social Assimilation among U.S. Immigrants

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Age at Arrival, English Proficiency, and Social Assimilation among U.S. Childhood Immigrants
Motivation 1

• Some facts:
  1. ~ 1 in 5 children in US is child of an immigrant
  2. Children of immigrants will be rising share of the population for years to come
  3. Many in homes in which English is not spoken
  4. In the 1990s, US enrollment grew 24%; LEP enrollment grew 105%

• Childhood immigrants as a bridge
• Age at arrival to the US
  • culture, education, health, etc.
Motivation 2

• Culture versus Constraints

• Case in point: English-language proficiency

• Critical period of language acquisition
Critical Period in Language Acquisition

• Younger children learn new languages more easily than older children.

• Consider foreign-born children who follow their parents to the US. Those who arrive at a younger age (low age at arrival) will be able to learn English more easily.

• Can’t attribute all age-at-arrival effects to language. Use immigrants from English-speaking countries as comparison.

• Our instrument is an interaction between age at arrival and country of origin. (We first used this in Bleakley and Chin (2004).)
Outline of talk

1. Motivation
2. Related literature
3. Empirical framework
4. Data
5. Results
6. Discussion
Related literature

• Papers on the link between English proficiency and marriage outcomes
  – Stevens and Swicegood (1987)
  – Davila and Mora (2001)
  – Meng and Gregory (2005)
  – Duncan and Trejo (2006)

• Papers on the link between English proficiency and fertility outcomes
  – Sorenson (1988)
  – Swicegood, Bean, Stephen and Opitz (1988)
  – Fernandez and Fogli (2006)

• Papers on the link between English proficiency and residential location outcomes
  – Funkhouser and Ramos (1993)
  – Lazear (2007)
Related literature

• Contributions of this paper:
  – Examine effect of age at arrival on social outcomes
  – Address problem of endogeneity of language skills in the relationship between language skills and social outcomes (specifically, marriage, fertility and residential location)
  – Examine a broader set of marriage outcomes
  – Estimate effects on a number of social outcomes using the same data and estimation framework
Data

• 2000 IPUMS

• Start with all childhood immigrants currently aged 25-55
  – Age at arrival = current age – (2000 - year of arrival)
  – We use age at arrival < 15

• Divide sample into individuals from non-English-speaking countries of birth and English-dominant countries

• Census language question: “How well does this person speak English? ” with the four possible responses “very well,” “well,” “not well” and “not at all.”

• To capture all the variation in English-speaking ability, we use an ordinal measure
  – = 0 if speaks “not at all”
  – = 1 if speaks “not well”
  – = 2 if speaks “well”
  – = 3 if speaks “very well” or does not report speaking a language other than English at home
English-Speaking Ability by Age at Arrival and Country of Origin

![Graph showing English-speaking ability by age at arrival and country of origin. The graph illustrates the decline in English ability as age at arrival increases, with two lines representing non-English country of birth and English country of birth.]
The graph shows the English ability (ordinal measure, 0 to 3) at different ages at arrival in the U.S. for individuals with a non-English country of birth (solid line) and English country of birth (dashed line). As age at arrival increases from 0 to 14, the English ability decreases for both groups, with the non-English birth group showing a more pronounced decline.

Legend:
- **Non-Eng ctry of birth**: Solid blue line
- **English ctry of birth**: Dashed pink line
Previous Work: Wages by Age at Arrival

The graph shows the log annual wages of workers by age at arrival in the U.S., distinguishing between those born in a non-English country and those born in an English country. The wages decline with age at arrival, with those born in a non-English country generally having lower wages compared to those born in an English country.
Income by Age at Arrival

Graph showing income by age at arrival in the U.S. for non-English country of birth (blue line) and English country of birth (pink line). The x-axis represents age at arrival in the U.S., ranging from 0 to 14, and the y-axes represent income levels from $9.60 to $10.15.

Legend:
- non-Eng ctry of birth
- English ctry of birth
Previous Work: Schooling by Age at Arrival

The diagram illustrates the relationship between age at arrival in the U.S. and years of schooling, distinguishing between individuals with non-English country of birth and those with English country of birth. The x-axis represents the age at arrival, ranging from 0 to 14 years, while the y-axis shows the years of schooling, ranging from 12 to 15.5. The data shows a general trend of decreasing years of schooling with increasing age at arrival, with a distinct pattern for non-English country of birth compared to English country of birth.
Previous Work: Children’s English Proficiency by Parent’s Age at Arrival

Age at arrival in the U.S. for immigrant parents

Difference in mean English ability for U.S.-born children

- Children 5-6
- Children 16-17
This presentation: Social Outcomes

- Marriage
- Spousal outcomes (“sorting”)
- Fertility
- Residence (“enclaves”)

Currently Married with Spouse Present by Age at Arrival

Regression-adjusted means

non-Eng ctry of birth
English ctry of birth
Spouse’s English-Speaking Ability by Age at Arrival
Number of Children Living in Same Household by Age at Arrival

Regression-adjusted means

non-Eng ctry of birth

English ctry of birth
Fraction of PUMA Population from Same Country of Birth by Age at Arrival

Regression-adjusted means

non-Eng ctry of birth

English ctry of birth
Reduced-form Estimation

• Equation of interest:
  \[ y_{ija} = \alpha + \beta \text{ENG}_{ija} + \delta_a + \gamma_j + w_{ija}'\rho + \varepsilon_{ija} \]
  
  for individual \( i \) born in country \( j \) arriving to the US at age \( a \)

• The identifying instrument:
  \[ k_{ija} = \max(0,a-9) \times I(j \text{ is a non-English-speaking country}) \]
  
  (we have used other parameterizations too, with similar results)

• The first-stage equation:
  \[ \text{ENG}_{ija} = \alpha_1 + \pi_1 k_{ija} + \delta_{1a} + \gamma_{1j} + w_{ija}'\rho_1 + \varepsilon_{1ija} \]

• The reduced-form equation:
  \[ y_{ija} = \alpha_{RF} + \pi_{RF} k_{ija} + \delta_{RF a} + \gamma_{RF j} + w_{ija}'\rho_{RF} + \varepsilon_{RF ija} \]
Table 2—Reduced-form Effects

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Coefficient for identifying instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: English Proficiency Measures</strong></td>
<td></td>
</tr>
<tr>
<td>1. Speaks English not well or better</td>
<td>-0.0061 ** (0.0031)</td>
</tr>
<tr>
<td>2. Speaks English well or better</td>
<td>-0.0293 ** (0.0124)</td>
</tr>
<tr>
<td>3. Speaks English very well</td>
<td>-0.0689 *** (0.0135)</td>
</tr>
<tr>
<td>4. English-speaking ability ordinal measure</td>
<td>-0.1043 *** (0.0288)</td>
</tr>
</tbody>
</table>
Table 2—Reduced-form Effects

Panel B: Marital Status
1. Is currently married with spouse present & 0.0112 ***
   & (0.0040)
2. Is currently divorced & -0.0054 ***
   & (0.0018)
3. Has ever married & 0.0075 ***
   & (0.0026)
### Table 2—Reduced-form Effects

#### Panel C: Spouse’s Nativity and Ethnicity

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Spouse English-speaking ability (ordinal measure)</td>
<td>-0.0859</td>
<td>***</td>
</tr>
<tr>
<td>2. Spouse is US-born</td>
<td>-0.0342</td>
<td>***</td>
</tr>
<tr>
<td>3. Spouse has the same country of birth</td>
<td>0.0373</td>
<td>***</td>
</tr>
<tr>
<td>4. Spouse has the same ancestry</td>
<td>0.0191</td>
<td>*</td>
</tr>
</tbody>
</table>

#### Panel D: Spouse’s Age and Education

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Spouse age</td>
<td>0.0956</td>
<td></td>
</tr>
<tr>
<td>2. Spouse years of schooling</td>
<td>-0.2493</td>
<td>***</td>
</tr>
</tbody>
</table>

#### Panel E: Spouse’s Labor Market Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Spouse log(wages last year)</td>
<td>-0.0314</td>
<td>***</td>
</tr>
<tr>
<td>2. Spouse worked last year</td>
<td>-0.0082</td>
<td>***</td>
</tr>
<tr>
<td>3. Both worked last year</td>
<td>-0.0127</td>
<td>**</td>
</tr>
</tbody>
</table>
## Table 2—Reduced-form Effects

### Panel F: Fertility

1. Number of children living in same household  \(0.0460 \text{ ***} \)  
   \(0.0142\)  

2. Has a child living in same household  \(0.0076 \text{ **} \)  
   \(0.0039\)  

3. Number of children living in same household, only individuals married with spouse present  \(0.0435 \text{ ***} \)  
   \(0.0139\)  

4. Has a child living in same household, only individuals married with spouse present  \(0.0007 \)  
   \(0.0022\)  

5. Is a single parent  \(-0.0022 \)  
   \(0.0027\)  

6. Is a never-married single parent  \(0.0003 \)  
   \(0.0018\)
Table 2—Reduced-form Effects

Panel G: Residential Location

1. Fraction of PUMA population from same country of birth 0.0007 (0.0007)

2. Fraction from same country of birth is above national mean 0.0035 (0.0072) for the country of birth

3. Fraction of PUMA population with same primary ancestry 0.0018 (0.0013)

4. Fraction with same ancestry primary is above national mean 0.0027 (0.0066) for the primary ancestry
IV Estimation

- Equation of interest:
  \[ y_{ija} = \alpha + \beta \text{ENG}_{ija} + \delta_a + \gamma_j + w_{ija}'\rho + \varepsilon_{ija} \]
  for individual \( i \) born in country \( j \) arriving to the US at age \( a \)

- The identifying instrument:
  \( k_{ija} = \max(0,a-9)*I(j \text{ is a non-English-speaking country}) \)

- Since the equation is just identified, the 2SLS coefficient is just the indirect least squares coefficient, i.e., \( \pi_{RF}/\pi_1 \)
  \( \pi_1 \approx 0.1 \) so the 2SLS-estimated effect is about 10 times the reduced-form effect and of opposite sign
Robustness Checks

• Key identifying assumption: Immigrants from non-English-speaking countries experience the same non-language age-at-arrival effects as immigrants from English-speaking countries

• But non-language age-at-arrival effects could differ. Anglophone countries…
  – tend to be richer,
  – have better school systems,
  – and their culture and institutions may be more similar to US

• We do the following:
  – Allow age-at-arrival effects to differ by origin-country GDP, fertility, school quality, life expectancy
  – Drop Canada and/or Mexico
  – Allow for region-specific linear trends (but not country-specific)
The Role of Education

• Does education mediate the effects of English proficiency?
  – Elsewhere, we have shown that much of the effect of English proficiency on earnings for childhood immigrants is through the large effect of English proficiency on educational attainment

• Rough idea: control for schooling; how much does English coefficient change?
  – Controlling for education reduces effects of English on spouse’s educational and labor-market outcomes substantially
  – …but does not change effects of English on marital status, spouse’s ethnicity and nativity, and fertility (even though education has significant effects on marital status and fertility)
Discussion

• Age at arrival and Critical Period leave their “footprint” in the data

• Working through English proficiency? Better English…
  – Our previous papers:
    • higher wages, more education
    • have children with worse educational outcomes
  – Current paper:
    • more likely be divorced
    • among those married with spouse present, spouse native, higher earning and more educated
    • fewer children
    • less likely to be in enclave, especially for women

• Relation to policy and public debates
  – When/how to target children of immigrants
  – Point system for immigration and age
  – Preferences vs constraints