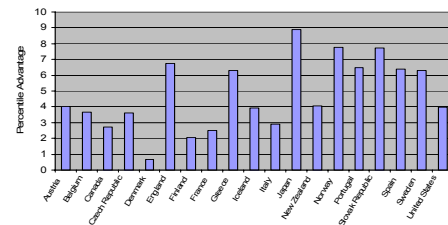


Is September Better than January? The Effect of Minimum School Entry Age Laws Skill Accumulation

Kelly Bedard and Elizabeth Dhuey
UCSB and University of Toronto

"Relative" age effects

Grade 8 Math: Oldest Month Compared to Youngest Month



Two questions

- How big are each component of the age effect?
- What is the overall impact of backing up the school cutoff date?

States with later cutoff dates have younger entrants

- This implies:
 - an earlier start for "school" skill accumulation
 - more "not ready for school" entrants
 - this may have direct and indirect effects

Cutoff change age effects

- Absolute age effect
 - for directly affected children
- Cohort age effect
 - for directly and indirectly affected children
- Relative age effects
 - for directly and indirectly affected children

Basic empirical strategy

- State of birth panel

$$W_{ibty} = \alpha_0 + \alpha_1 S_{bt} + X_{ibty} \alpha_2 + A_{ty} \alpha_3 + B_b \alpha_4 + T_t \alpha_5 + \varepsilon_{ibty}$$

W_{ibty} = ln weekly wage for individual i born in state b in year t observed in Census/ACS year y

S = minimum school entry age

A = current age

B = state of birth

T = year of birth

Minimum school entry age laws

Cutoff Month	Number of States		
	1964	1986	2005
January / February	13	7	2
December	5	3	2
November	5	3	0
October	10	12	5
September / Start of school year (SSY)	8	18	32
July / August	0	0	2
Local education authority (LEA)	3	4	7
None	6	1	0

Cutoff data sources

- State Statutes (listed in Appendix Table 2)
- Cross-referenced with:
 - Angrist and Krueger (1992)
 - Cascio and Lewis (2005)
 - Digest of Education Statistics (1972, 1973, 1983)
 - Educational Research Service (1975)
 - Education Commission of the States website

Cutoff date coding

- All laws are coded as first of the month or mid-month
- States with no law are coded as missing in those years
- LEAs are coded as missing (we have no sub-state level information)
- Start of school year laws are coded as September 1
- Sample includes state cutoffs from 1964-1986

Minimum school entry age coding

- Cutoff dates are translated into the youngest legal school entry age
- Examples

<u>Cutoff date</u>	<u>Minimum entry age</u>
January 1	56 months (4 years and 8 months)
October 15	58.5 months
September 1	60 months

Wage data

- 1959-1981 U.S. born white male cohorts
- 2000 U.S. 5 percent Census
- 2001-2006 American Community Surveys
 - ▶ this gives us 16 cutoff changes
 - ▶ for 25-47 year old men who reside in 44 contiguous states
 - ▶ white men who are not currently enrolled in school, report positive earnings, usually work at least 10 hours a week and worked 20 or more weeks (part time) or usually work at least 30 hours a week and worked 40 or more weeks (full time)

Other education policy controls

- School exit laws
- Pupil-teacher ratios
- Relative teachers salaries
- State subsidization of kindergarten

Short-run effects of minimum school entry age laws

- Compliance with entry law changes
- Changes in educational attainment

First grade enrollment

$$E_{iry} = \beta_0 + \beta_1 G_{ry} + Y_{ry} \beta_2 + \beta_3 Q_{iry} + v_{iry}$$

E_{iry} = enrollment status of child i residing in state r in year y
 G = fraction of 4th quarter children ineligible for school entry
 Y = year
 Q = 4th quarter baby

First grade enrollment

	4th Quarter Age 6 (1)	3rd Quarter Age 6 (2)	1st Quarter Age 5 (3)
Fraction of 4th quarter children ineligible	-0.526 (0.034)	-0.064 (0.024)	-0.074 (0.022)
Fraction of birth quarter ineligible		-0.360 (0.250)	
Quarter 1			0.079 (0.015)
Quarter 3		-0.011 (0.011)	
Quarter 4	-0.144 (0.032)		
Sample size	44,537	41,994	40,570

Heteroskedastic-consistent standard errors in parentheses. All models are population weighted and clustered at the state level. Bold coefficients are significant at the 5 percent level. All models also include state-specific year indicators.

Educational attainment

$$Ed_{ibty} = \pi_0 + \pi_1 S_{bt} + X_{ibty} \pi_2 + A_{ibty} \pi_3 + B_b \alpha_4 + T_t \pi_5 + \omega_{ibty}$$

	All Men (1)	Part Time + (2)	Full Time + (3)
High school graduate or higher	0.0012 (0.0012)	-0.0009 (0.0015)	0.0015 (0.0015)
Some college or higher	0.0008 (0.0022)	0.0012 (0.0027)	0.0037 (0.0030)
BA or higher	0.0017 (0.0016)	0.0026 (0.0021)	0.0036 (0.0022)

All models are population weighted and clustered at the state of birth level. All models also include controls for kindergarten subsidization, pupil teacher ratio, relative salary of teachers, compulsory school leaving age, census year level unemployment rates and GDP, marital status, state of birth, state of residence, region of birth specific birth year indicators, and region of residence specific age indicators.

In Weekly wages

	Part Time + (1)	Full Time + (2)
Base Specification		
No education controls	0.0073 (0.0032)	0.0093 (0.0029)
With education controls	0.0062 (0.0029)	0.0071 (0.0027)
By education group		
High school dropouts	0.0102 (0.0045)	0.0136 (0.0041)
High school graduates	0.0133 (0.0039)	0.0144 (0.0039)
Some college	0.0092 (0.0033)	0.0096 (0.0029)
BA or higher	-0.0050 (0.0042)	-0.0039 (0.0039)

All models are population weighted and clustered at the state of birth level. All models also include controls for kindergarten subsidization, pupil teacher ratio, relative salary of teachers, compulsory school leaving age, census year level unemployment rates and GDP, marital status, state of birth, state of residence, region of birth specific birth year indicators, and region of residence specific age indicators.

In Weekly wages

	Part Time + (1)	Full Time + (2)
Base Specification		
No education controls	0.0073 (0.0032)	0.0093 (0.0029)
Aggregate Specification		
No education controls		
Across all years	0.0076 (0.0041)	0.0084 (0.0041)
Five year average	0.0082 (0.0060)	0.0084 (0.0055)

All models are population weighted and clustered at the state of birth level. All models also include controls for kindergarten subsidization, pupil teacher ratio, relative salary of teachers, compulsory school leaving age, census year level unemployment rates and GDP, marital status, state of birth, state of residence, region of birth specific birth year indicators, and region of residence specific age indicators.

By quarter of birth (2005 and 2006 ACS)

	Part Time + (1)	Full Time + (2)
Panel A		
Pooled	0.0094 (0.0034)	0.0109 (0.0036)
Panel B		
January-March	0.0129 (0.0034)	0.0160 (0.0036)
April-June	0.0072 (0.0039)	0.0091 (0.0038)
July-September	0.0095 (0.0040)	0.0084 (0.0042)
October-December	0.0080 (0.0039)	0.0103 (0.0040)
Sample Size	309,120	278,346

All models are population weighted and clustered at the state of birth level. All models also include controls for kindergarten substitution, pupil teacher ratio, relative salary of teachers, compulsory school leaving age, census year level unemployment rates and GDP, marital status, state of birth, state of residence, region of birth specific birth year indicators, quarter of birth indicators, and a survey year indicator.

Summary

Increasing the minimum school entry age

- has no discernable impact on educational attainment
- Increases average weekly earnings by approximately 0.7 percent per month
 - a January to October change increases average hourly earnings by 2.1 percent