L&S 39G

Health, Human Behavior, and Data

Prof. Ryan Edwards

Class 12
Case studies:
Season of birth and later outcomes

November 17, 2015
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<td><strong>TERM PAPER DUE</strong></td>
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<td>Angela &amp; Eric</td>
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Today’s agenda

• Some quick i>clicker questions about the readings
• More in depth on the reading
• Hands on
Office Hours

- This week, normal office hours
- Wednesday 11/25 before Thanksgiving is a non-instructional day, no office hours
When would you most like to have a newborn child?

A. In January, to brighten the darkest days of winter
B. In April, after taxes are due, when it’s mild outside
C. In July, when school is out and people take vacations
D. In October, so my summer vacation can just transform into a babycation
i>clicker question 12.2

Why would we expect season of birth to matter for children’s outcomes?

A. Children born in the winter can legally drop out at age 18 before finishing high school

B. Children born in the winter have sad wintery birthday parties

C. Children born in the summer get birthday money just in time to start new jobs
Suppose wealthy moms have kids during the summer. How would we expect kids born in the summer to compare to other kids?

A. They’re more bratty and spoiled
B. They have better education outcomes
C. They’re less healthy
D. They should be exactly the same
Story arc of the course

• Some basics in health economics

• Randomized controlled trials
  - When we apply a treatment $x$ to one *randomly selected* group and see how it changes an outcome $y$

• Observational studies
  - When we see groups with different $y$'s and $x$'s, what do we do?

• In-between studies: Exogenous variables like weather, the macroeconomy, *season of birth* (?,) end of wars
Material from last time, Veterans Day week
Participation by birth cohorts in the midcentury conflicts dropped sharply for cohort born 16 or 17 years before the end of each war.

Universe: Male birth cohorts in the U.S.

Source: Health and Retirement Study 2008
Military service of any kind and exposure to combat and casualties also vary across birth cohorts.

Year and quarter of birth

Veteran rate

Combat zone exposure rate

Exposure to dead/dying rate

Sources: Census 1980; 2001 National Survey of Veterans. Universe: Male birth cohorts in the U.S.
Surviving veterans of Iraq and Afghanistan report combat exposure near record highs

Universe: Veteran male birth cohorts in the U.S. Source: 2010 National Survey of Veterans
Angrist and Krueger (1994)

• Their goal is to reexamine how earnings vary with veteran status

• Comparing male veterans to male nonveterans is problematic
  - Veterans of WWII, draftees or volunteers, could be inherently different than nonveterans
  - Also true today when military service is voluntary

• Method: examine birth cohorts of men, across which veteran status varies systematically, but not other characteristics
Figure 1. Earnings of men born in 1926 Q3 or Q4

Source: Small and Rosenbaum (2008)
Figure 2. Earnings and WWII veteran status for men born in Q3 or Q4

Source: Small and Rosenbaum (2008)
Buckles and Hungerman (2013)

• Themes:
  - Many parents choose when to conceive with a goal of delivering at a desire time of year
  - Not all parents are the same; high-SES parents seem to time births more effectively to arrive around the summer

• Background:
  - Contraceptive pill approved by the FDA in 1960
  - Access was limited to single women at first, but expanded in the 1960s and 1970s
Buckles and Hungerman (2013) Figure 1

A: Percent Teenagers

C: Percent White
Buckles and Hungerman (2013) Figure 2

- Births to single women drop off in spring
- Births to married women drop off in winter
- Produces big changes in mothers’ characteristics in Q1 and Q2
Buckles and Hungerman (2013) Table 1

Birth weight in grams

- Jan: 3,335 grams
- Feb: 3,345 grams
- Mar: 3,355 grams
- Apr: 3,360 grams
- May: 3,355 grams
- Jun: 3,345 grams
- Jul: 3,340 grams
- Aug: 3,345 grams
- Sep: 3,355 grams
- Oct: 3,340 grams
- Nov: 3,335 grams
- Dec: 3,330 grams
How much do parental characteristics and choices matter?

• Own season of birth $x$ seems to explain key outcomes $y$ like education and earnings

• But B&H show that own season of birth $x$ is determined by parental characteristics and choices $z$

• One way to proceed:
  
  - Model \[ y_i = \alpha + \beta x_i + \varepsilon_{1i} \]
  \[ y_i = \alpha + \beta x_i + \delta z_i + \varepsilon_{2i} \]
  
  - See what happens to $\beta$ when we include “family controls” $z$
$$y_i = \alpha + \beta x_i + \varepsilon_{1i}$$

$$y_i = \alpha + \beta x_i + \delta z_i + \varepsilon_{2i}$$

### Table 3. Maternal Characteristics and Education

<table>
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<th>Years of Schooling</th>
<th>No Family Controls</th>
<th>Family Controls</th>
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<tbody>
<tr>
<td>Second birth quarter</td>
<td>0.037 [0.013]</td>
<td>0.024 [0.011]</td>
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<tr>
<td>Third birth quarter</td>
<td>0.055 [0.012]</td>
<td>0.041 [0.011]</td>
</tr>
<tr>
<td>Fourth birth quarter</td>
<td>0.062 [0.013]</td>
<td>0.037 [0.011]</td>
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Wald test that birth quarter Coefficients are the same

$$\chi^2[3] = 30.91$$

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<th>Family characteristics?</th>
<th>No</th>
<th>Yes</th>
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<td>$R^2$</td>
<td>0.904</td>
<td>0.914</td>
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What drives seasonality in births?

• Buckles and Hungerman examine wanted vs. unwanted births in survey data
  - There seems to be no seasonality in unwanted births
  - All of the seasonality stems from wanted births

• Upshots:
  - With greater fertility control via the pill, stronger seasonality in births in more recent years
  - Wanted births may be seasonally planned to hit a delivery window, rather than affected by conditions at conception
Buckles and Hungerman (2013) Figure 3

- Weather at birth is strongest driver of these seasonal patterns
Figure 3: Estimated Temperature-Fertility Relationship: Effect of Daily Mean Temperature >80 °F Relative to 60-70 °F on Log Birth Rate, by Months from Exposure

![Graph showing the relationship between temperature and log birth rate](image)

Note: The diamonds are the point estimates and the brackets represent +/- two standard errors. The estimates can be interpreted as the impact on the log monthly birth rate, in log points, of one additional day with a mean temperature >80 °F relative to 60-70 °F. The model has year-month fixed effects, state-by-calendar-month fixed effects, state-by-calendar month quadratic time trends, and state-year fixed effects. We control for fraction of days with precipitation between 0.01 and 0.50 inches and over 0.51 inches in each month. In addition, we control for effects for up to 24 months after exposure (and 3 months prior to exposure as a placebo check). Estimates are weighted by state-year population. Standard errors are clustered at the state-level. The gray shading highlights both 0 and 9 months from exposure.
Data

Folder:

http://demog.berkeley.edu/~redwards/ls39g.html

Direct links:

http://demog.berkeley.edu/~redwards/Courses/LS39G/c12_b1960.csv

http://demog.berkeley.edu/~redwards/Courses/LS39G/c12_b1970.csv

http://demog.berkeley.edu/~redwards/Courses/LS39G/c12_b1980.csv

Questions:

What does the seasonality (across birth quarters) of mother's characteristics look like? *Age, education, race, marital status, poverty*

Did the seasonality of mother's characteristics change across these 3 decades?