Using Restricted Data to Understand the Effects of Early Childhood Interventions: The Case of Family Planning

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September 17, 2013

Presentation based on work that is joint with
Olga Malkova and Zoë McLaren
About Me

- My research examines questions in labor economics, demography and health in the United States, within the long-run perspective of economic history.

- Much of my work looks at the role of oral contraception—and policies that encouraged its diffusion during the 1960s—for childbearing, women’s career trajectories, and the gender gap.
The Debate over Family Planning

Supply-side ("family planning gap")
- Westoff (1975: 579): "the entire decline in births within marriage across the decade of the 'sixties' can be attributed to the improvement in the control of fertility".
- Robey, Rutstein, and Morris (1993:62): state that "differences in contraceptive prevalence explain about 90 percent of the variation in fertility rates" and "fertility levels have dropped most sharply where family planning has increased most dramatically".

Demand-side ("desired children view")
- Becker (1981:143): “The ‘contraceptive revolution’ … ushered in by the pill has probably not been a major cause of the sharp drop in fertility in recent decades”
- Pritchett (1994:3): “the challenge of reducing people’s fertility is the challenge of reducing people’s fertility desires”
Implications of Debate over Family Planning

- Relate to current Congressional debates

- Relate to understanding how the economy evolves, population forecasting, the role of technology (like “the Pill”) and public policies in subsidizing it
The Challenge of Testing these Assertions

- Desire for a smaller family size and contraceptive use are closely intertwined

- Areas with different ideas about children tend to use contraception more, build more family planning centers, etc.
Partial Equilibrium vs. General Equilibrium

- Much of my work has focused on these questions, primarily as they relate to women’s integration into the economy and their childbearing.
- Quasi-experimental research designs provide evidence that the contraceptive technology affected childbearing and women’s careers, but likely understates its broader significance.
  - Contamination of the comparison group, e.g., due to mobility, cross-cohort spillovers, reductions in statistical discrimination.
- But what is the bigger picture?
Was the Pill and contraceptive revolution the product of an already underway cultural revolution?

Did the Pill unleash the large cultural revolution since 1960?

What are the longer-term implications of policies that regulate or subsidize contraception?

Implications for children?
Family planning will “promote the integrity of the family and the opportunity for each child”
~President Lyndon Johnson, March 1, 1966

Unwanted or untimely childbearing is one of several forces which are driving many families into poverty or keeping them in that condition.
~President Richard Nixon, July 18, 1969
How Family Planning affected the *Next Generation*

- “Next generation” = individuals whose parents gained legal access or subsidies to contraception

- Possible channels:
  - Family size or number of siblings
  - Time and economic resources
  - Class and cohort sizes
  - Credit or institutional constraints (for going to college)
  - Outcomes as adults (economic and non-economic)

Recent work with Olga Malkova and Zoë McLaren
Does Family Planning Affect Children’s Economic Resources?

“Family planning” =
- Programs subsidizing medical contraception, counseling, and related medical services

Research design:
- Exploits the distribution of federal family planning grants from 1964 to 1973—funds engendered the creation or significant expansion of local programs

Restricted 1970 and 1980 census data:
- Makes ITT-style, regression-adjusted comparisons of outcomes of children born just before vs. just after the first federal family planning grant
This Talk

- Theoretical motivation for thinking about how family planning may affect children’s resources
- Research design to disentangle family planning’s effects


- Family Planning Programs
- Childbearing Outcomes
- Children’s Resources

Bailey, Malkova and McLaren (2013):
Restricted census data from 1970 and 1980
Theoretical Motivation
Child Poverty and Economic Outcomes

- **Children in poor households**
  - receive less parental time and fewer resources (Guryan et al. 2008)
  - experience delayed academic development, have health problems, live in more dangerous neighborhoods, and attend underperforming schools (Levine and Zimmerman 2010)
  - have lower test scores (Reardon 2011)
  - less likely to complete high school, enroll in college and complete college (Bailey and Dynarski 2011)
  - more likely to live in income poverty as adults (Pew Charitable Trusts 2012)

- **Empirical evidence on the causal channels is incomplete**
The Relationship between Family Size and Poverty

- Poor parents also have more children
  - Opportunity cost
  - Child “quality” is a normal or luxury good
  - More children limit parents opportunities, which may feedback into children’s opportunities
The Cycle of Poverty and Policy Interventions

- Child Economic Disadvantage
- Adult Economic Disadvantage
- Family Size
- Family Planning
- Early Childhood Interventions
Mechanisms for this Relationship

1. Reducing the cost of averting births and reducing unintended births
2. Increasing parents’ human capital and relationship capital
   - Family planning allows lower cost delay of childbearing
   - Benefititting least affluent most
3. Quantity-quality implications:
   - Fewer children (#1) and more income (#2) increase investments in kids
How Family Planning Affects Investment in Children

- Reducing the **number of children in household**
  - Reducing shadow price of child “quality”
- **Increasing household income**
  - Reducing the price of delaying childbearing to make human capital investments
  - Reducing the price of searching for a better mate
  - Benefitting poor families
  - Increase investments in poor children due to the income elasticity of child quality

Observed in census data
Research Design

Family Planning Programs

Childbearing Outcomes

Children’s Resources

Bailey (2012)
1964 Economic Opportunity Act

- Administered by the Office of Economic Opportunity (OEO)

- Almost 1 billion in outlays
  - Bulk of funds budgeted for human capital (Head Start, Job Corps, etc)
The First OEO Grants

• Any organization could apply to the OEO
  Applications from “various and sundry groups”
  ~Theodore Berry, Assistant Director of the OEO

• No funding precedent; no guidelines
  
  *It was a wild sort of operation in those early days, making the first grants. We didn’t have any guidelines and didn’t have the time really to draft them to start out…*

  ~Donald Baker, chief counsel for the OEO (Gillette 1996)
Federal Spending on Family Planning

1967: Amendment Economic Opportunity Act designates family planning as a “national emphasis” program

November 1970: Title X of Public Health Service Act enacted

- 2008 Dollars in Millions

- Title X Appropriations
- Federal Outlays from All Sources
Family Planning Grants Covered

- Counseling and education
- Costs of medical services and medical contraception
- Not explicitly means tested
- Set up in places without a program or with small programs
Research Design and Data

- Exploit variation in when and where federal programs began from 1964 to 1973

- Link this grant information to other data:
  - Vital Statistics on natality (Bailey 2012, public data)
  - Census data on outcomes (Bailey, Malkova and McLaren, RDC)
Key Assumptions

1. Excludability: Family planning grants do not affect childbearing or children’s resources except through the proposed channels

2. Exogeneity: Timing and location of federal family planning grants as good as random after accounting for other model covariates

3. Relevance: Federal family planning programs meaningfully increased the use of family planning services
Exogeneity

- Historical accounts of the “wild” operation of grant-making or “administrative confusion”

- Empirical evidence that date program began
  - Not predicted by 1960 characteristics or fertility rates
  - Not predicted 1965 NFS characteristics (e.g., social mores, sexual behavior, birth control use)

- Timing of program establishment not coincident with other War on Poverty grants
Fertility Rates and the Roll-Out of Family Planning Programs

Slope = 0.13, S.E. = 0.42

Slope = 0.11, S.E. = 0.24
1965 Characteristics and the Roll-Out of Family Planning Programs

<table>
<thead>
<tr>
<th>(1) Population Growth a Problem</th>
<th>(2) Ideal Number of Children</th>
<th>(3) Approve of Abortion</th>
<th>(4) Coital Frequency</th>
<th>(5) Ever Used the Pill</th>
<th>(6) When 1st Used Pill Ever Used</th>
<th>(7) Surgically Sterilized</th>
<th>(8) Children Ever Born to Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Dependent Variable</td>
<td>0.80</td>
<td>3.3</td>
<td>0.39</td>
<td>6.04</td>
<td>0.22</td>
<td>772</td>
<td>0.198</td>
</tr>
<tr>
<td>Year Family Planning Program Established</td>
<td>[0.007]</td>
<td>[0.022]</td>
<td>[0.005]</td>
<td>[0.071]</td>
<td>[0.010]</td>
<td>[0.384]</td>
<td>[0.008]</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.021</td>
<td>0.038</td>
<td>0.023</td>
<td>0.136</td>
<td>0.154</td>
<td>0.022</td>
<td>0.095</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(9) Married Once</th>
<th>(10) Age at 1st Marriage</th>
<th>(11) Age at 1st Pregnancy</th>
<th>(12) Children Ever Born</th>
<th>(13) Husband’s Income</th>
<th>(14) Catholic</th>
<th>(15) Highest Grade</th>
<th>(16) 2 Parents at 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Dependent Variable</td>
<td>0.87</td>
<td>20.8</td>
<td>22.3</td>
<td>2.7</td>
<td>7620</td>
<td>0.29</td>
<td>11.3</td>
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<tr>
<td>Year Family Planning Program Established</td>
<td>[0.005]</td>
<td>[0.059]</td>
<td>[0.066]</td>
<td>[0.031]</td>
<td>[157]</td>
<td>[0.016]</td>
<td>[0.104]</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.040</td>
<td>0.111</td>
<td>0.160</td>
<td>0.141</td>
<td>0.170</td>
<td>0.001</td>
<td>0.092</td>
</tr>
</tbody>
</table>

Notes: Dependent variables are coded as follows by column: (1) Do you consider the growth of world population a serious problem? Yes=1. (2) What is the ideal number of children for average American family? (3) Index from three questions about whether the respondent approves of abortion if a woman is not married, for health concerns, or in the case of financial hardship. 1=approve in all three cases; (4) Coital frequency in the last four weeks? (5) Have you ever used the Pill? Yes=1. (6) When did you first use the Pill? (month and year, 772 = March 1964). (7) Have you or your husband had an operating making it impossible to have (another) child? 1=Yes; (8) How many children did your mother have? (9) Is this your first marriage? 1=Yes; (10-11) Age in months constructed from month and year of birth and month and year of first marriage and month and year of first pregnancy end date; (12) How many live births have you had? (13) Husband’s income in nominal dollars. (14) Respondent identifies as “Roman Catholic.” (15) Highest grade attained by the respondent. (16) Did you live with both parents at age 14? 1=Yes. Estimates are obtained from weighted regressions of the indicated dependent variable on the year the family planning program was established. To account for sampling design, the regressions control for size of sampled PSU, decade of respondent’s birth, and race (1=Nonwhite). Source: 1965 National Fertility Study.
Relevance

- Evidence that family planning programs meaningfully increased the use of more effective contraception
  1. OEO administrative surveys of all clinics show use of “family planning” increased by 4.5 pp in funded areas (~100%)
  2. 1970 National Fertility Study of ever married women shows an increase of 8pp increase in Pill use among poor women (12-15%)

- Evidence that family planning programs reduced births

\[ Y_{j,t} = \theta_j + \gamma_{s(j),t} + \sum_{y=-8}^{1} \pi_y D_j 1(t - T_j^* = y) + \sum_{y=1}^{16} \tau_y D_j 1(t - T_j^* = y) + X_{jt}' \beta + \varepsilon_{jt} \]

- **Y**: Fertility outcome
- \( \theta \) and \( \gamma \): County and year (or state-by-year) effects
- **D_j**: Dummy variable for whether county gets family planning program; \( 1() \) is a dummy indicated years before/after event
- **Xs**:
  - **REIS**: Time varying, county-level government transfers cash public assistance (AFDC, SSI, GA), medical spending (Medicare and military health care), cash retirement and disability payments
  - **1960 county characteristics interacted with linear trends**
    - proportion of population in urban area, nonwhite, over 64 years of age, with income under $3k, and the proportion of the county’s land that is rural or on a farm
  - County-level abortion controls
Model 1: County and year effects

General Fertility Rate

Before family planning programs established, econometric model captures the evolution of fertility rates.
General Fertility Rate

Model 1: County and year effects

Model 2: County + state by year effects
Summary

- Family planning grants reduces fertility rates by 2 percent within 5 years; 1.4 percent lower 15 years later.

- 8 percent of the total decline in GFR from 1959 to 1974 (~1.8 million fewer births over 15 years).

- Cost per birth averted is roughly $2700.

- Is this small? Not really!
  - Scaling the ITT effects by the beneficiaries implies 30-40% reduction among women who began using Pill.
  - GFR among poor women fell by 20-30 percent over 10 years.
  - 3/4 of the 1965 gap in childbearing between poor and non-poor women.
Did Family Planning Affect Children’s Economic Resources?

Family Planning Programs

Childbearing Outcomes

Children’s Resources

Bailey (2012)

Bailey, McLaren, and Malkova (2013)
Integrates Bailey (2012) with Gruber et al. (1999): compare children’s outcomes born just before vs. after family planning begins

\[ Y_{j,t} = \theta_{j} + \gamma_{s(j),t} + X_{j,t}' \beta + \sum_{y=a}^{b} \tau_{y} 1(t-T_{j} = y) + \epsilon_{j,t} \]

- **Y**: Outcome in 1970 or 1980 census of child born in year \( t \) residing in county \( j \)
- **\( \theta \) and \( \gamma \)**: County and birth-year (state-by-birth-year) fixed effects
- **\( X \)**: As before
Empirical Challenges

- Census is a household survey: no information on a birth cohorts’ resources or family size if not living with parents
  - Limits analysis to 17 years before each census

- Public use census contains information on county group of residence at the time of census
  - Introduces misclassification in key independent variable which will attenuate the results
Is Geographic Misclassification Important Empirically?

- Diagnostic tool: Use RDC 1965/1975 county of residence (available for ½ long form respondents) and 1970/1980 residence to examine the correlates of mobility
  - Misclassification error increases in funded counties after family planning begins; especially the case relative to unfunded counties
  - Misclassification error is larger in larger cities

- Diagnostic tool: Compare fertility results from Vital Statistics to county-year fertility rates implied by the census
  - Re-estimating fertility regressions with census data shows zero changes after family planning programs begin
Solutions

- Ongoing work uses a reweighting approach based on 5-year population transitions

- Today I will show a naïve approach
  - Limit sample to funded counties only
  - We do not weight regressions by population
Results
Mean Household Income (2009$)

All Children in Average Treated Areas (Mean 1970: $25,100 in 2009%)

$1,150 = 5-post grant average
~ 5% increase over 1970
Mean Household Income (Public Data)

Estimates 1/3 the magnitude
How Large is This for Beneficiaries?

- Family planning use increased by 5 pp
- Each woman has ~2 children

- ATET: $1,150 \times (1/0.10) = $11,500 in annual hh income
  - As large as 3/4 full-time, full-year minimum wage worker at the 2009 federal minimum wage ($7.25)

- Relative to 1960 poverty line for family of 4: $22,117
  \( \Rightarrow \) 50% increase
Children in Poverty
Share Children Below 100% of Poverty

All Children in the Average Treated Location (Mean 1970: 21.7%)

1.1 pp reduction = 5% decline
Share of Children Below 150% of Poverty

All Children in the Average Treated Location (Mean 1970: 37.2%)

1.4 pp reduction = 3.8 % decline
## Summary of Effects for Child Poverty

<table>
<thead>
<tr>
<th>Poverty Measure</th>
<th>Overall</th>
<th>White</th>
<th>Nonwhite</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100%</td>
<td>-5.0%</td>
<td>-2.1%</td>
<td>-4.9%</td>
</tr>
<tr>
<td>&lt;150%</td>
<td>-3.8%</td>
<td>-2.5%</td>
<td>-2.4%</td>
</tr>
<tr>
<td>&lt;200%</td>
<td>-1.8%</td>
<td>-0.6%</td>
<td>-1.3%</td>
</tr>
</tbody>
</table>
Public Assistance
Share of Children in HHs Receiving Public Assistance

All Children in the Average Treated Location (Mean 1970: 7.6%)

1.5 pp reduction = 15.2 % decline
Share of Children Living with Single Heads

All Children in the Average Treated Location (Mean 1970: 12.8%)

0.52 pp reduction = 4.1 % decline
The Role of Composition
Mean Older Siblings

All Children in the Average Treated Location (Mean 1970: 1.9)

0.041 reduction = 2% decline
Mean Age of Mother at Time of Birth

All Children in the Average Treated Location (Mean 1970: 25.8)

0.17 reduction = 0.6 % decline
Do Family Planning Programs Increase Children’s Economic Resources?

- Short answer: yes
- We provide new evidence that federal family planning programs associated with reductions in childhood economic disadvantage
- Interpretation and mechanisms is challenging
  - Parental investments in own human capital, relationship stability, and but also selection
  - Underestimate increases in investments in children if
    - older siblings also benefitted
    - income elasticity of child “quality” is greater than child quantity (as in Becker and Lewis 1973)
Returns to Investing in Family Planning

- Costs: $300 million federal dollars per year in costs

- Benefits: Household Income: $300-1,110 per year * benefitting kids

- Return per federal dollar spent:
  - LCI in restricted data $1.12 per dollar spent
  - Mean in restricted data $4.35 per dollar spent
  - Mean in public data <$1