Moved to Opportunity: The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

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How does growing up in a disadvantaged neighborhood affect long-run child outcomes?

- ► Large observational literature shows children from disadvantaged areas have notably worse outcomes

  - ► Ellen and Turner (1997); Cutler and Glaeser (1997); Altonji and Mansfield (2014); Chetty et al., (2014)

- ► Yet, some experimental evidence finds few significant effects of moving to better neighborhoods

  - ► Katz et al. (2001); Oreopolous (2003); Sanbonmatsu et al., (2011)

- ► Existence and size of neighborhood effects is uncertain

  - ► This view has started to change due to recent work: Chetty, Hendren and Katz (2015); Chetty and Hendren (2015)

This Paper's Contribution

- ▸ Provide new evidence on neighborhood effects for children from two different housing policy interventions

  1. Natural experiment created by public housing demolition

  2. Housing voucher lottery

- ▸ Compare these two contexts to answer two questions:

  1. What are the benefits of relocating youth in a general population?

  2. Do children of volunteers benefit more or less than average?
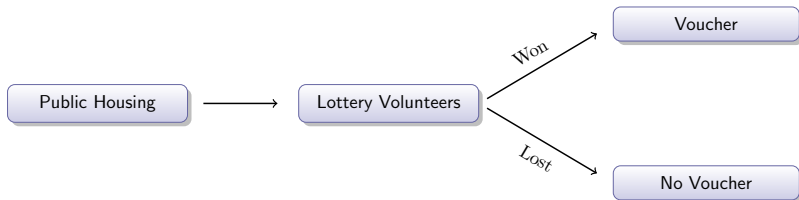
Natural Experiment Research Design

Public Housing Demolition in Chicago
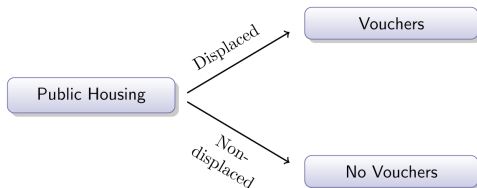
- ▶ Identification: Displacement unrelated to resident characteristics (Jacob, 2004)

- ▶ Results: Displaced children are (1) more likely to work, (2) have higher annual earnings and (3) have fewer arrests for violent crime
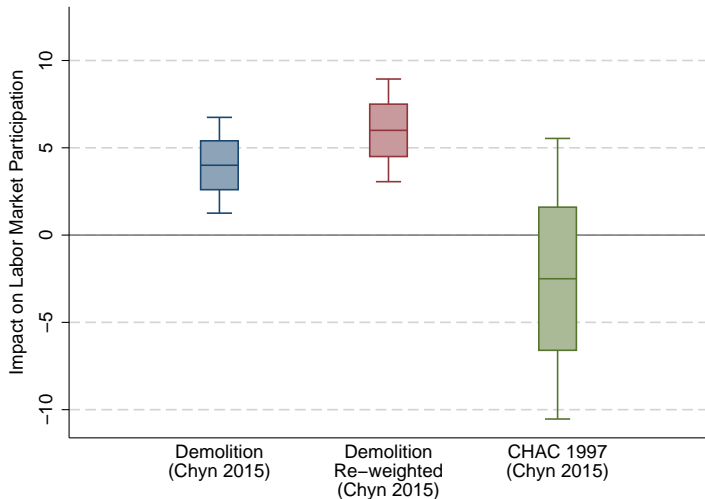
Lottery Design
The 1997 Chicago Housing Voucher Lottery

- ▶ Main finding: Small and not statistically significant effects on lottery children outcomes

Notable contrast between demolition and lottery results

Comparing Employment Effects Across Experiments

Interpreting the Evidence and Implications

- ▶ Pattern consistent with larger benefits for children from households where parents have low demand for moving

    - ▶ Demolition $\Rightarrow$ General set of households

    - ▶ Lottery $\Rightarrow$ Subset with **high willingness** to move

- ▶ "Reverse Roy" and parental behavior in education studies:

    - ▶ Boston charter schools (Walters, 2015)

    - ▶ North Carolina school choice (Hastings et al., 2008)

- ▶ Benefits to moving children from public housing may be larger than estimates based on experiments such as MTO

Outline / Road Map

1. Public Housing Demolition in Chicago

   ▶ Background on Public Housing and Demolition

   ▶ Data and Empirical Design

   ▶ The Effects of Demolition on Children

2. The 1997 Housing Voucher Lottery in Chicago

   ▶ Background and Data

   ▶ The Effects of the Lottery on Children

3. Interpreting the Evidence

   ▶ Comparing Estimates Across Studies

   ▶ An Economic Model of Reverse Roy in Housing Programs

Public Housing and Demolition in Chicago

What is public housing?

- ▶ Goal: Provide "decent" housing for low-income families

- ▶ Large residential buildings (high-rises) built in close proximity

  - ▶ A **collection** of buildings is called a housing project

Figure 1: Robert Taylor Homes

What is public housing? (continued)

- Federally supported program, but owned and operated by local (city) authority

- Assistance is *not* an entitlement – long waiting lists

- Value of subsidy is large: $\approx$ \$8,000 per year (HUD, 2015)

Public Housing in Chicago

- Descriptive statistics:

  1. Third largest public housing system during the 1990s

  2. Average household income: $7,000

  3. 20% of units have more than 5 people

  4. Nearly all residents are African-American

Why did Chicago demolish public housing?

- ▶ Reaction to serious management and infrastructure problems
  - ▶ Buildings built during the 50s and 60s cheaply
  - ▶ Few believed the Chicago Housing Authority (CHA) could deal with maintenance issues
    - ▶ Scandals revealed officials had mismanaged public funds
- ▶ Local politicians proposed demolition and expanding voucher assistance
 - ▶ Limited funding for demolition

How were buildings selected for demolition?

- Limited funding $\Rightarrow$ selection of buildings based on specific maintenance issues (Jacob, 2004)

  - Initial demolitions motivated by specific crises

  - Ex. Pipes burst in Robert Taylor high-rise buildings

What happened to residents from demolished buildings?

- ▶ Provided housing vouchers and compensated for moving costs
  - ▶ Note: Vouchers and project-based assistance have the same rules ⇒ No effect on budget set

- ▶ Households moved to lower poverty areas:

Densities of Neighborhood Poverty Rates

% of Neighborhood (Tract) Residents Below Poverty Line

- - - - Non–Displaced Households   —— Displaced Households
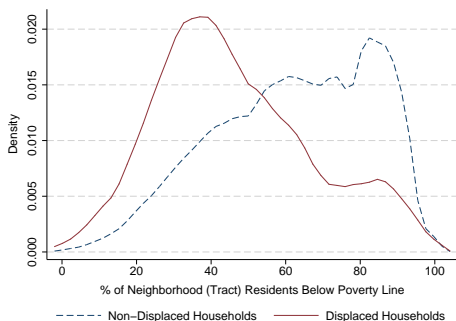
Data and Sample Description

1. CHA data on buildings
   - Jacob (2004): Demolitions from 1995-1998
   - Building sample: 24 treated and 30 control buildings

2. Social assistance (TANF/AFDC, Foodstamps, Medicaid) files
   - Match building addresses to case records
   - $\approx 2{,}800$ households with public housing address in year before demolition

3. Quarterly earnings from unemployment insurance records
   - Match all children (age 7 to 18) to labor market records
   - 5,250 displaced (treated) and non-displaced (control) children

Research Design: Comparing Displaced and
Non-Displaced Children Within Projects

Estimating Equation

- Reduced form:

$$Y_{it} = \alpha + \beta D_{b(i)} + X_i'\theta + \psi_{p(i)} + \delta_t + \epsilon_{it}$$

where i is an individual; t indexes years; b is a building and p is a project.

- D is an indicator equal to 1 if i lived in a demolished building

- $\psi_{p(i)}$ and δ_t are project and year fixed effects, respectively

- **Key:** Identification comes from within project comparison

Threats to Identification

1. Main concern: displaced and non-displaced residents differ

   ▶ Identification argument is historical and statistical

      1.1 CHA selected buildings with worst maintenance $\Rightarrow$ Not based on resident characteristics

      1.2 Examine baseline (before demolition) characteristics to test for differences

Displaced and Non-displaced Adults Prior to Demolition

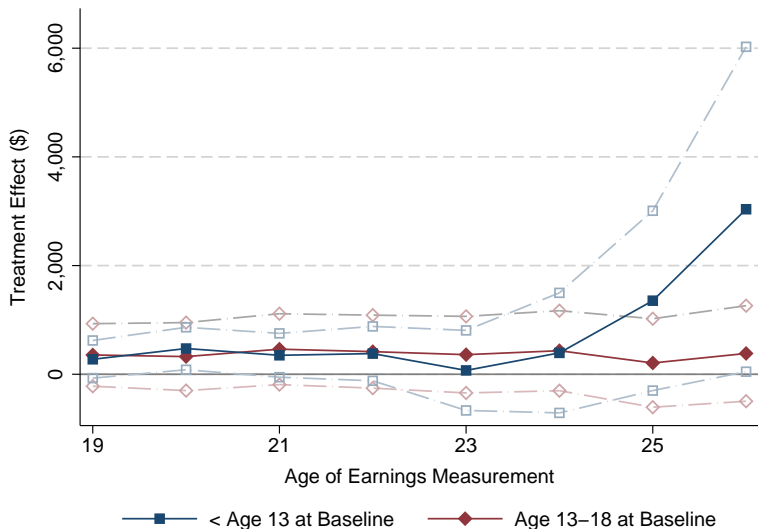|	Adults	
	Control Mean	Diff: Treated–Control, Within Estimate
Demographics		
Age	28.851	0.810**
		[0.312]
Male (=1)	0.128	-0.001
		[0.011]
Past Arrests		
Violent	0.185	-0.017
		[0.032]
Property	0.156	0.016
		[0.020]
Drugs	0.166	0.031
		[0.022]
Other	0.230	-0.018
		[0.028]
Labor Market Activity		
Employed (=1)	0.173	-0.006
		[0.016]
Earnings (Rank)	1,493.75	-45.91
		[193.358]
N (Individuals)		4,331

Threats to Identification (continued)

2. Attrition: Demolition may affect residency in Illinois

   ▶ No evidence that treatment is correlated with residency/attrition

3. Spatial spillovers: Demolition may affect non-displaced residents

   ▶ Two tests suggest that there is no evidence of spillover effects

      ▶ Ex. Event study of neighborhood crime (i.e. homicide rate) as a measure of overall conditions Results

What is the impact of demolition on children's
long-run outcomes?

Demolition Impact on Adult Labor Market Outcomes of Children

	Panel Model Results	
	(1)	(2)
	Control Mean	Difference: Treated-Control, Within Estimate
Employed (=1)	0.419	0.040***
		[0.014]
Employed Full Time (=1)	0.099	0.013**
		[0.006]
Earnings	$3,713.00	$602.27***
		[153.915]
Earnings (> 0)	$8,856.91	$587.56**
		[222.595]
N (Obs.)		35,382
N (Individuals)		5,246

How do effects on earnings vary over time by age group?

Treatment Effect ($) vs. Age of Earnings Measurement

Legend: ■ < Age 13 at Baseline ◆ Age 13–18 at Baseline

The 1997 Chicago Housing Voucher Lottery

The 1997 Chicago Housing Voucher Lottery
Comparing Estimates within Chicago

- ► Opened voucher wait list for the first time in 12 years

- ► Motivated households signed up (similar to MTO)

- ► Demand for vouchers far exceeded supply ⇒ Authority randomly allocates vouchers

Data and Sample

- ▶ Use housing authority application and administrative data
  - ▶ Jacob and Ludwig (2012) and Jacob et al. (2015)

- ▶ Examine lottery participants with children (age 7 to 18) living in public housing at baseline
  - ▶ Changing the *type* of assistance

- ▶ Child sample:
  - ▶ Voucher winners: 1,300
  - ▶ Voucher losers: 3,400

Empirical Approach
Estimating the Impact of Vouchers

▶ We want to estimate:

$$V_i = \alpha + \tau Z_i + X_i'\theta + \eta_i$$
$$Y_{it} = \alpha + \gamma V_i + X_i'\theta + \epsilon_{it}$$

where i is an individual; t indexes years.

▶ V is an indicator equal to 1 if i uses a voucher

▶ Key: Voucher offer Z is a valid instrument for using a voucher

# What is the impact of vouchers for children from lottery households?

2SLS Results: The Impact of Housing Vouchers

| | Panel Model Results | | |
	(1)	(2)	(3)
	Control Mean	Difference: Treated-Control (Reduced Form)	LATE (2SLS)
Employed	0.463	-0.008	-0.025
		[0.013]	[0.041]
Employed Full Time (=1)	0.125	-0.003	-0.008
		[0.010]	[0.026]
Earnings	$4,724.83	$3.04	$9.37
		[258.574]	[794.805]
Earnings (> 0)	$10,214.81	$256.05	$788.83
		[380.898]	[1173.760]
N (Obs.)		33,718	33,718
N (Individuals)		4,661	4,661

Interpreting Results

Comparing Estimates Across Studies

Effects on Employment (1/0)
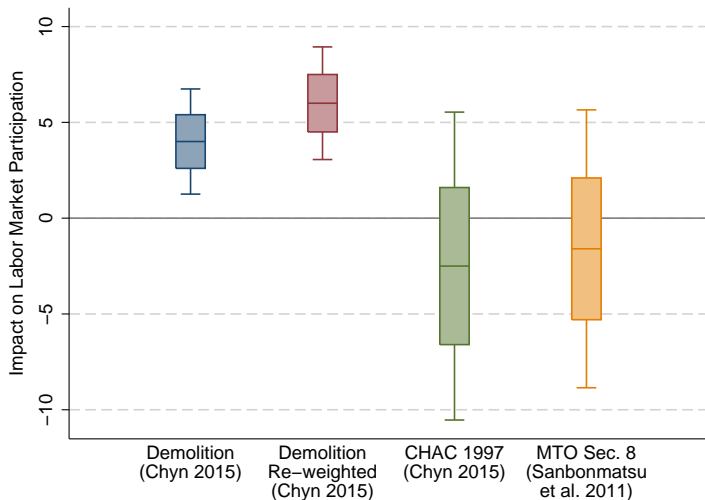
Comparing Estimates Across Studies (continued)

Effects on Earnings
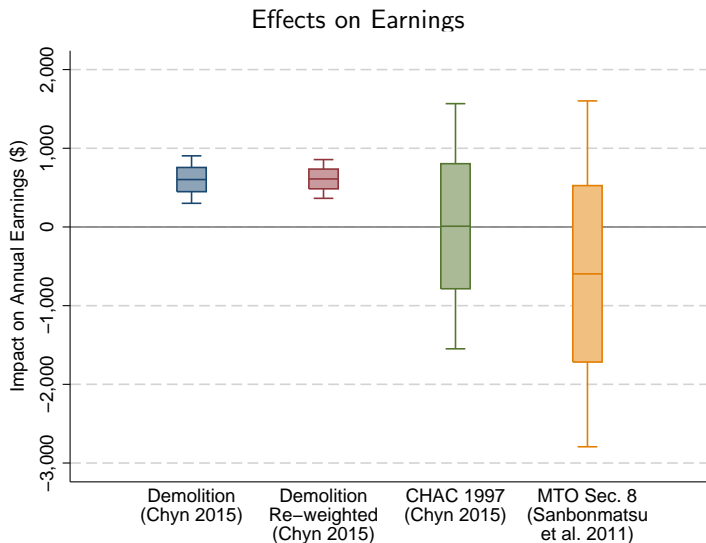
Summary of Results

- Notable pattern of treatment effects:
  - Demolition effects are larger than the CHAC 1997 lottery and MTO estimates
  - Test null of equal effects:
    - Employment p-value $= 0.13$
    - Earnings p-value $= 0.46$

Interpretation of Estimates

- Differences in voucher and relocation mechanisms:
  1. Demolition:
     - Authority selects buildings and mandatory voucher use
     - $\approx$ Average Treatment Effect (ATE)
  2. Lottery/MTO:
     - Volunteers and optional voucher use
     - Local Average Treatment Effect (LATE)

- Results imply there are children who would benefit from relocation, but live with parents who have low demand for moving

What kind of economic model is consistent with this pattern of results?

A Simple Model of Reverse Roy

- ▶ A variety of models of parental behavior can generate negative selection into programs such as MTO

- ▶ Investment models with parental heterogeneity:

    - ▶ Information

    - ▶ Preferences (Altruism)

    - ▶ Moving Costs and Income

Model Motivation

- ▶ Simple model to account for two findings from qualitative research on MTO

  1. Parents signed up for MTO due to fear of crime

     - ▶ 80% of participants listed crime as their first or second main motivation

  2. Fear of crime affected parenting style

     - ▶ "[F]ear has led mothers to constantly monitor their children's activities." (Kling et al., 2001)

     - ▶ Parents **reduced** child supervising behavior after moving through MTO

Main Ingredients: Public Housing Parents and Investments in Children

1. Parents care about consumption and child outcomes

2. Child outcomes depend on a parenting behavior and neighborhood quality

3. Parents all have the same resources (income)

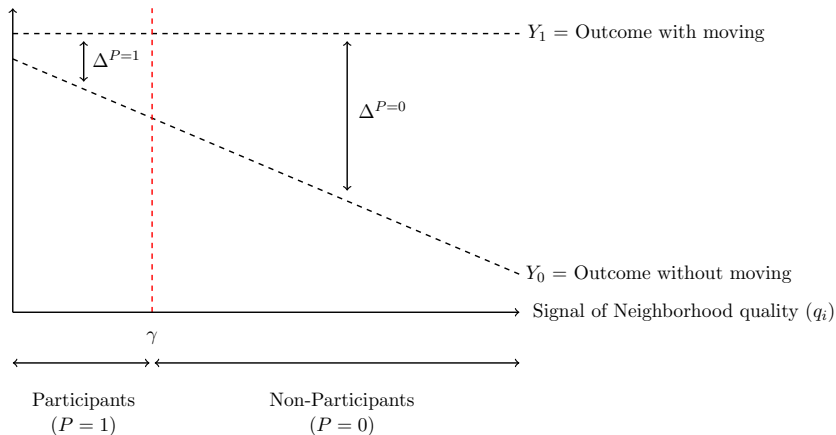4. Parents have imperfect information about neighborhood quality:

$$q_i = \lambda + \epsilon_i$$

Simple Parameterization

- ► Log utility

- ► Effort and neighborhood quality are substitutes in child outcomes

- ► Moving through a voucher program is costly, but allows children to live in a better neighborhood

- ► **Optimization:** Parents who believe their neighborhood is sufficiently low quality (q_i) choose to:

    1. Monitor/invest in their child *more*

    2. Opt into a moving program if given the opportunity
        - ► Cutoff: Participate if $q_i < \gamma$

Illustration: Treatment Effects and Selective Participation

Child Outcomes (Y_i)

$Y_1 = $ Outcome with moving

$\Delta^{P=1}$

$\Delta^{P=0}$

$Y_0 = $ Outcome without moving

Signal of Neighborhood quality (q_i)

γ

Participants
$(P = 1)$

Non-Participants
$(P = 0)$

Implications and Key Contributions

Policy Implications

- Simple cost-benefit calculation:

    - Costs:
        - One-time moving cost $\approx$ \$1,100 per household
        - Project-based and voucher assistance have similar expenses

    - Benefit:
        - Back-of-the-envelope lifetime earnings gains = \$45,000

- Summary:

    - Benefits far exceed costs for each household that relocates

    - Given increased tax revenue, demolition should lead to net gains for government budgets

Contribution #1: Large Positive Benefits of Relocating

- Demolition and relocation had a large positive impact on children

- These estimates differ notably from previous studies
  - Moving to Opportunity (MTO) results:
    - 2011: No detectable benefits for children
    - 2015: Positive impact on young (ages 7 to 13) children

- Key distinction:
  - Young displaced children show benefits at earlier ages
  - Older displaced children show gains despite spending most of their lives living in a disadvantaged area

- Negative selection into program participation can explain this pattern

Contribution #2: Neighborhoods Effects and Schooling Outcomes

- ▶ Analysis suggests the impact of neighborhoods does not run through schooling outcomes like test scores
    - ▶ Chyn (Unpublished): No long-run impact on test-scores or other academic outcomes

- ▶ Lack of effects on test-scores is similar to previous work:
    - ▶ Jacob (2004): No short-run impact on test-scores or other academic outcomes

    - ▶ MTO (2011) analysis of schooling

# Contribution #3: Program Participation and Negative Selection

- ▶ Adds to an emerging literature showing negative selection into programs that affect children

- ▶ Education studies: Children who would most benefit from attending a charter or other high-quality school are the least likely to choose these schools

- ▶ Implication: Experiments that rely on volunteers may understate the benefits for programs that affect children

Thank you for your time and comments!

Bonus Slides / Presentation Appendix

How does the impact of demolition on neighborhood quality change over time?

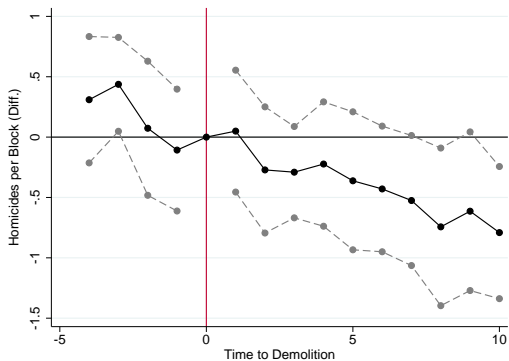Difference in Neighborhood Poverty by Post-Demolition Year
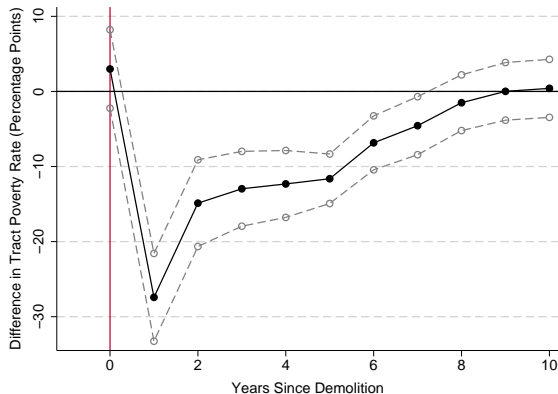
Comparing Demolition and Lottery Sample Characteristics

Adults in Households with Children (Age 7-18)

	Lottery Sample	Demolition Sample	p-value
# Adults	1.44	1.18	0.00
Single Female Head (=1)	0.69	0.83	0.00
Age	31.68	32.16	0.01
Earnings	$5,595.30	$2,089.98	0.00
Employed (=1)	0.36	0.19	0.00
Past Arrests, Any	0.66	0.76	0.01
N (Households)	2,242	2,313	

◂ Go Back

Testing for Spillovers Neighborhood-level Homicide Event Study