Motivation I

• Racial Inequality in America persists
  – Large Black-White gaps in academic achievement, earnings & employment, family incomes, health & life expectancy, incarceration, and teen pregnancy
  – Substantial Hispanic-White economic gaps as well

• U.S. residential economic segregation has increased sharply, especially for Blacks & Hispanics

• Rising school segregation by family income

• Rising gaps in parental resources and academic achievement by family income & SES since 1980

• IGE stable with rising inequality → larger economic consequences to accidents of birth
Reardon and Bischoff (2011)

Trends in Family Income Segregation, by Race
Metropolitan Areas With Population > 500,000

- All Families
- White Families
- Black Families
- Hispanic Families


H
Motivation II

- Children growing up in low-income neighborhoods fare worse on economic, education, and health outcomes.

- A strong positive relationship exists between neighborhood family incomes and student academic achievement.

- Adults in poor neighborhoods have worse economic and health outcomes.

- These patterns remain but are attenuated after controlling for family background and resources and could reflect:
  - Neighborhood characteristics (peers, role models, safety, resources)
  - School Quality
  - Unmeasured family background characteristics from non-random sorting of families to neighborhoods and Schools.
8th grade Math and ELA Performance by New York City Neighborhood (Zip Code) Income
Potential Policy Responses

• **Neighborhoods**: What are the causal impacts of improved neighborhood conditions (like neighborhood safety) or moves to lower-poverty neighborhoods on child outcomes?
  – Macro (MSA) vs. Micro (Block) neighborhoods

• **Schools**: Are high-quality schools enough?

• Interactions of neighborhoods and schools

• **Family resources, Parenting (Nurse-Family Partnership), Early Childhood Education**
This talk: I examine emerging evidence from credible quasi-experimental and experimental sources of variation in neighborhoods and schools

Focus on

- Long-term evaluation of Moving to Opportunity (MTO) Housing Mobility Experiment
- Dobbie-Fryer work on Harlem Children’s Zone

Draws on

Moving to Opportunity Long-Term Study

Lawrence F. Katz, Principal Investigator, Harvard University and NBER
Jens Ludwig, Project Director, University of Chicago and NBER
Lisa Sanbonmatsu, Project Manager, NBER

www.mto research.org

Other Main Collaborators:
Greg Duncan, UC Irvine
Lisa Gennetian, Brookings Institution
Jeffrey Kling, CBO and NBER

Health Team Collaborators:
Emma Adam, Northwestern U
Stacy Tessler Lindau, Univ. of Chicago
Thomas McDade, Northwestern Univ.
Robert Whitaker, Temple University
MTO Long-Term Study Publications


R. Kessler et al. (2014), “Associations of Housing Mobility Interventions for Children in High-Poverty Neighborhoods with Subsequent Mental Disorders during Adolescence,” *JAMA* 311(9).

*Cityscape* (2012), Symposium on MTO, 14(2).
Conceptual Framework

• Simple Reduced Form Model for Each Outcome $j$ (e.g., Human Capital, Health, Risky Behavior):

$$outcome^j = f^j(\eta, \sigma, \phi)$$

• Where $\eta$ represents neighborhood quality, $\sigma$ denotes school quality, and $\phi$ captures family background

• An ideal randomized experiment
  – Treatment of improving neighborhood quality while keeping school quality constant estimates $\frac{\partial f^j}{\partial \eta}$
  – Treatment of improving school quality while leaving the neighborhood unchanged estimates $\frac{\partial f^j}{\partial \sigma}$
MTO vs. Harlem Children’s Zone

- **MTO Randomized Housing Mobility Experiment**
  - Large improvements in neighborhood conditions
  - Small improvements in school quality
  - MTO Treatment Impact Estimates Provide an Upper-bound on pure micro neighborhood quality effect $\frac{\partial f^j}{\partial \eta}$
MTO vs. Harlem Children’s Zone

- Harlem Children’s Zone (HCZ): 97-block area in Harlem, NYC with web of neighborhood services (baby college, pre-school, health and neighborhood safety) and high-quality “No Excuses” Charter School – Promise Academy with lottery for admissions

  - (a) Lottery winners vs. lottery losers in zone gets pure school quality effect with high neighborhood quality $\frac{\partial f^j}{\partial \sigma}|_{\text{high } \eta}$

  - (b) Lottery winners vs. lottery losers outside zone gets pure school quality effect with low neighborhood quality $\frac{\partial f^j}{\partial \sigma}|_{\text{low } \eta}$

  - Difference of (a) and (b) gives interaction effect subject to caveat of out of zone lottery winners gaining access to other HCZ services

  - RD at zone border for lottery losers gives pure neighborhood effect
Past Evidence on Neighborhood Effects I

• Cross-Section Studies (e.g., Brooks-Gunn et al. 1993 *AJS*)
  – Strong neighborhood effects that weaken substantially with further controls for family background in PSID, NLSY, etc.
  – Problem of selection bias (unobservable family background variables correlated with neighborhood attributes) lead to upward bias and measurement issues (what is a neighborhood?) lead to downward attenuation bias

• Area studies and place-based policy evaluations
  – Kline-Busso (AER 2013); Rob Sampson and Collaborators
  – Do the pre-existing residents benefit?

• Longitudinal Sibling Studies: Aaronson (1998 *JHR*)
  – Study families that move and compare siblings spending time in different neighborhoods – include family fixed effects
  – Substantial impacts as in cross-section studies but issues of endogenous moves correlated with unobserved changes in family circumstances or differences by sibling in unobserved characteristics
Past Evidence on Neighborhood Effects II

- Quasi-Experimental Housing Mobility Studies
  - Gautreaux Studies – Rosenbaum (1995) – large impacts of moves to suburbs vs. central city in Chicago on child outcomes but attrition and non-random selection issues; much smaller effects in Duncan, Mendenhall longer-term studies
  - Oreopoulos (2003 *QJE*) – Toronto public housing assignments
  - Jacob (2004 *AER*) – Chicago public housing demolitions
  - Gibbons, Silva, & Weinhardt (2013 *EJ*) – residential migration with controls for individual & school-by-cohort fixed effects for England
  - Quasi-Experimental studies show little impact of neighborhoods on test scores or longer-term child outcomes when controlling for schools (Gibbons et al.) or with little change in school quality (Oreopoulos and Jacob)
The MTO Experiment

- MTO demonstration authorized by U.S. Congress
  -- Housing and Community Development Act of 1992

- A randomized social experiment

- Open to families with children living in:
  -- public housing or in project-based assisted housing
  -- high-poverty neighborhoods (poverty rate \( \geq 40\% \))

- 5 Sites: Baltimore, Boston, Chicago, Los Angeles, and New York

- 4600 families enrolled from 1994 to 1998
# Random Assignment to 3 Groups

<table>
<thead>
<tr>
<th>Control</th>
<th>No vouchers – remain eligible for current project-based housing assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental or Low-Poverty Voucher</td>
<td>Restricted Section 8 voucher (&lt;10% Poverty Census Tract) + Mobility Counseling</td>
</tr>
<tr>
<td>Section 8 or Traditional Voucher</td>
<td>Conventional Section 8 vouchers</td>
</tr>
</tbody>
</table>
MTO Families Resided in Public Housing and Project-Based Housing at Baseline
Some Baseline Characteristics of MTO Households

Employment and Marital Status
• 25 percent of household heads were employed at baseline.
• 87 percent single-parent female-headed households.

Race/Ethnicity
• Almost 2/3 of sample are black.
• Baltimore and Chicago samples are almost 100 percent black.
• LA, and NY are roughly 50 percent black, 50 percent Hispanic.
• About 40 percent of the sample in Boston is black.

Main Reason to Move
• Fear of violent crime.
MTO Interim Findings (Kling-Liebman-Katz *EMA* 2007)
4-7 Years After Random Assignment

- Substantial adult gains in mental & physical health
- Little impact on adult economic self-sufficiency
- Gender gap for youth: positive impacts for girls, not for boys
- Reactions to mixed results
  - Many Sociologists: “Weak Treatment” so not informative
  - Many Economists: “Neighborhoods Don’t Matter”
  - MTO Research Team – neighborhoods matter in more subtle ways than simple models; particularly important for health
  - What about longer term impacts? What about children that moved at young ages before forming school peer groups?
Final Impacts Evaluation

Survey Data Collection Joint Survey Research Center at the University of Michigan

Surveys Collected from June 2008 to April 2010
(10-15 Years After Random Assignment)

- Adult Household Heads (N=3273)
- Youth ages 10 to 20 in Dec 2007 (N=5101)
- Grown Children 21-30 & under 18 at baseline (N=3217)
- Two-Stage Sampling – once reach 75% response rate by site then intensive efforts at random 35% of remaining cases
- Effective Response Rates: 90% for Adults; 89% for youth
- Response rates almost identical by MTO treatment groups

Administrative Data

- State UI Earnings, AFDC/TANF, and Food Stamps
- Adult & Juvenile arrest histories
- School district data and NSC college enrollment data
- Housing assistance from HUD administrative data
# Estimating MTO Impacts

<table>
<thead>
<tr>
<th>Impact Measure</th>
<th>Represents</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intent to Treat (ITT)</td>
<td>Impact on ALL members of treatment group</td>
<td>Dummy for treatment group in regression</td>
</tr>
<tr>
<td>Treatment on Treated (TOT)</td>
<td>Impact on TREATED members of treatment group (lease-ups): assumes zero impact on non-lease-ups</td>
<td>ITT estimate divided by proportion who leased up</td>
</tr>
</tbody>
</table>
Compliance Rates

**Experimental Group:** 47% leased-up

**Section 8 Group:** 63% leased-up

We will present ITT results. For TOT, multiply experimental group estimates by 2.1 and Section 8 estimates by 1.6.
Types of Neighborhoods to which MTO Experimental Families Moved
## MTO effects on neighborhood poverty

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Control Mean</th>
<th>Exp vs. Control</th>
<th>S8 vs. Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ITT TOT</td>
<td>ITT TOT</td>
</tr>
<tr>
<td>Percent Poor - Baseline</td>
<td>53.103</td>
<td>-0.392 -0.808</td>
<td>-0.474 -0.754</td>
</tr>
<tr>
<td></td>
<td>(0.457) (0.942)</td>
<td>(0.567) (0.903)</td>
<td></td>
</tr>
<tr>
<td>Percent Poor - 1 Year After RA</td>
<td>49.970</td>
<td>-17.024 * -35.151 *</td>
<td>-14.135 * -22.434 *</td>
</tr>
<tr>
<td></td>
<td>(0.767) (1.584)</td>
<td>(0.892) (1.416)</td>
<td></td>
</tr>
<tr>
<td>Percent Poor - 5 Years After RA</td>
<td>40.012</td>
<td>-9.953 * -20.389 *</td>
<td>-6.971 * -11.124 *</td>
</tr>
<tr>
<td></td>
<td>(0.745) (1.527)</td>
<td>(0.939) (1.499)</td>
<td></td>
</tr>
<tr>
<td>Percent Poor - 10 Years After RA</td>
<td>33.050</td>
<td>-4.655 * -9.588 *</td>
<td>-3.994 * -6.403 *</td>
</tr>
<tr>
<td></td>
<td>(0.690) (1.420)</td>
<td>(0.880) (1.411)</td>
<td></td>
</tr>
<tr>
<td>Percent Poor - Duration-Weighted</td>
<td>39.685</td>
<td>-8.955 * -18.432 *</td>
<td>-6.861 * -10.940 *</td>
</tr>
<tr>
<td></td>
<td>(0.566) (1.165)</td>
<td>(0.673) (1.074)</td>
<td></td>
</tr>
</tbody>
</table>
Neighborhood Poverty Distribution (Duration-Weighted)

Experimental Compliers vs Control Compliers

Density vs Neighborhood Poverty Rate

Con Compliers (Exp) vs Exp Compliers
Neighborhood Poverty Distribution (Duration-Weighted)

Section 8 Compliers vs Control Compliers

Density vs Neighborhood Poverty Rate

- Con Compliers (S8)
- S8 Compliers
### Impacts on Neighborhoods & Housing

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Control Mean</th>
<th>Intent-To-Treat Exp vs. Control</th>
<th>Intent-To-Treat S* vs. Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. (duration-weighted) tract minority</td>
<td>.880</td>
<td>-.060*</td>
<td>-.010</td>
</tr>
<tr>
<td>Adult felt unsafe during day</td>
<td>.196</td>
<td>-.036*</td>
<td>-.047*</td>
</tr>
<tr>
<td>Collective efficacy†</td>
<td>.589</td>
<td>.076*</td>
<td>.042</td>
</tr>
<tr>
<td>Has 1+ friends w/ college degree</td>
<td>.532</td>
<td>.071*</td>
<td>-.018</td>
</tr>
<tr>
<td>Very satisfied or satisfied with current neighborhood</td>
<td>.515</td>
<td>.094*</td>
<td>.082*</td>
</tr>
<tr>
<td>Number of housing problems</td>
<td>2.051</td>
<td>-.359*</td>
<td>-.395*</td>
</tr>
<tr>
<td>Number of moves since baseline</td>
<td>2.165</td>
<td>.555*</td>
<td>.588*</td>
</tr>
<tr>
<td>Total Monthly Housing Costs</td>
<td>$679</td>
<td>19.50</td>
<td>-6.26</td>
</tr>
<tr>
<td>Avg School % Rank on State Exam</td>
<td>18.7</td>
<td>3.1*</td>
<td>1.2*</td>
</tr>
</tbody>
</table>

Notes: * = p < .05. ~ = p < .10.

† = Likely/very likely neighbors would do something about kids doing graffiti on local building.
MTO Impacts on Adults

**Mental Health** – beneficial impacts on psychological distress and some mental health disorders

**Physical Health** – beneficial impacts on severe obesity, diabetes, stress indicators, and health limitations

**Economic Self-Sufficiency** – no detectable effects
  – contrast with positive & sustained impacts of Jobs Plus, EITC impacts, and macro labor impacts

**Subjective Well-Being** – substantial improvements
<table>
<thead>
<tr>
<th>Outcome</th>
<th>Control Mean</th>
<th>Intent-To-Treat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Exp vs. Control</td>
</tr>
<tr>
<td>Major Depression</td>
<td>.203</td>
<td>−.032~</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.017)</td>
</tr>
<tr>
<td>Generalized Anxiety Disorder</td>
<td>.065</td>
<td>−.003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.010)</td>
</tr>
<tr>
<td>Psychological Distress Index (K6 Z-Score)</td>
<td>.000</td>
<td>−.104*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.039)</td>
</tr>
<tr>
<td>Absence of Mental Health Problems</td>
<td>.000</td>
<td>.070~</td>
</tr>
<tr>
<td>Index (Mean Z-Score - depression, anxiety,</td>
<td></td>
<td>(.041)</td>
</tr>
<tr>
<td>distress, calm, sleep)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: * = p < .05, ~ = p < .10
## Impacts on Adult Physical Health

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Control Mean</th>
<th>Intent-To-Treat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Exp vs. Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S8 vs. Control</td>
</tr>
<tr>
<td>Physical limitations</td>
<td>.510</td>
<td>−.048*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.021)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>−.023</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.028)</td>
</tr>
<tr>
<td>High Risk C-reactive protein (&gt;3mg/L)</td>
<td>.586</td>
<td>−.042~</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.024)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.030)</td>
</tr>
<tr>
<td>Obese Class II (BMI ≥ 35)</td>
<td>.351</td>
<td>−.046*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.020)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>−.053*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.027)</td>
</tr>
<tr>
<td>Diabetes (HbA1c ≥ 6.5)</td>
<td>.204</td>
<td>−.052*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.018)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>−.011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.024)</td>
</tr>
</tbody>
</table>

Notes:  * = p < .05, ~ = p < .10
BMI $\geq 35$ and Neighborhood Poverty (Duration-Weighted)
Adult Employment by Quarters Since Randomization

Percent Employed

Number of Quarters Since Random Assignment

- Experimental group mean
- Section 8 group mean
- Control group mean
MTO Impacts on Subjective Well-Being

• Was MTO a Success? What do the Respondents say?
  – They asked for neighborhood safety and got it

• Summary Evaluation using GSS Happiness question implies:
  – MTO moves improve SWB by 0.20 standard deviations
  – 1-standard deviation decrease in duration-weighted tract poverty rates induced by MTO is associated with 0.14 standard deviations higher subjective well-being.
  – About equal in magnitude to two-thirds of the overall gap in SWB between blacks & whites in U.S.
  – Also equivalent in size to change in happiness associated with $13,000 per year increase in permanent income as compared to average control group income in long-term follow-up of ~$20,000
TOT Estimates of MTO Impacts on Happiness and Absence Of Psychological Distress

**A** Effects on Happiness

**B** Effects on Absence of Psychological Distress (Index)
MTO Adult Impact Conclusions

• Impacts still substantial after 10-15 years
  – New neighborhoods were safer and less poor, housing was better
  – Beneficial adult mental & physical health impacts
  – Large obesity and diabetes impacts
  – No detectable impacts on adult economic outcomes
  – Contrast with MDRC Jobs Plus demonstration – increase returns to work, training, placement within public housing → sustained income and earnings gains

• Substantial adult happiness gains
  – Moving to Tranquility rather than Opportunity?
  – Neighborhood economic segregation rather than racial segregation seems to matter most
  – Worrisome given racial segregation declining since 1970 while income segregation has been increasing – problem getting worse?
# MTO Impacts on Neighborhood Quality for Youths

## A. Neighborhood Quality

<table>
<thead>
<tr>
<th></th>
<th>Control mean</th>
<th>Experimental versus Control</th>
<th>Section 8 versus Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ITT</td>
<td>TOT</td>
</tr>
<tr>
<td><strong>Average Census Tract Poverty Rate, MTO Youth</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share Poor</td>
<td>0.399</td>
<td>-0.090</td>
<td>-0.188</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.013)</td>
<td></td>
</tr>
<tr>
<td>Share Poor, percentile units among U.S. tracts</td>
<td>91.85</td>
<td>-8.87</td>
<td>-18.38</td>
</tr>
<tr>
<td></td>
<td>(0.64)</td>
<td>(1.09)</td>
<td></td>
</tr>
<tr>
<td>Share Poor, z-score on U.S. tracts</td>
<td>2.102</td>
<td>-0.733</td>
<td>-1.520</td>
</tr>
<tr>
<td></td>
<td>(0.057)</td>
<td>(0.102)</td>
<td></td>
</tr>
</tbody>
</table>
# MTO Impacts on School Quality

## B. School Quality for Average School Attended

<table>
<thead>
<tr>
<th>Share Eligible for Free- or Reduced-Price Lunch</th>
<th>Control mean</th>
<th>Experimental versus Control</th>
<th>Section 8 versus Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ITT</td>
<td>TOT</td>
</tr>
<tr>
<td>0.752</td>
<td>-0.040</td>
<td>-0.083</td>
<td>-0.019</td>
</tr>
<tr>
<td>(0.007)</td>
<td>(0.014)</td>
<td>(0.008)</td>
<td>(0.012)</td>
</tr>
<tr>
<td>School Percentile Ranking on State Exam</td>
<td>18.68</td>
<td>3.07</td>
<td>1.22</td>
</tr>
<tr>
<td></td>
<td>(0.65)</td>
<td>(1.36)</td>
<td>(0.66)</td>
</tr>
<tr>
<td>0.797</td>
<td>0.020</td>
<td>0.043</td>
<td>-0.002</td>
</tr>
<tr>
<td>(0.011)</td>
<td>(0.023)</td>
<td>(0.012)</td>
<td>(0.017)</td>
</tr>
<tr>
<td>School Climate Index, All</td>
<td>0.786</td>
<td>0.025</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.032)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>School Climate Index, Female</td>
<td>0.807</td>
<td>0.016</td>
<td>-0.011</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.031)</td>
<td>(0.016)</td>
</tr>
</tbody>
</table>
MTO Experimental Long-Term Impacts on Youth Summary Indices

Notes: * = p < .05, ~ = p < .10
MTO Impacts on Children/Youth

- MTO treatments led to much larger changes in neighborhood quality than school quality
  - Change in share poor in Census tract more than twice as large as share poor in schools
  - Change in nghd poverty rank 3 times larger than school test score rank
- MTO Treatments Improved Girls Mental Health (Depression and Conduct Disorder ↓, but not for Boys (PTSD, Depression, and Conduct Disorder ↑) – see Kessler et al. (JAMA 2014)
- MTO had no detectable long-run impacts on academic achievement, educational outcomes, risky behaviors
- MTO → short-run declines in arrests for boys (0-4 years) that fade

Implications:

\[ \frac{\partial f^{human\ capital}}{\partial \eta} \approx 0 \text{ for boys and girls} \]

\[ \frac{\partial f^{health}}{\partial \eta} > 0 \text{ for girls but 0 for boys} \]

- Site*Treatment group variation → No impact of nghd poverty on education/risky behavior but some positive effect of school quality
IV Partial Leverage Plot
For MTO Male Youth:

Education Outcomes
Vs. School Climate
Controlling for
Neighborhood Poverty
And Site Fixed Effects

Site*Treatment Group
As instruments for
School climate index
and tract share poor

p value = .04 for school climate
Slope coefficient
IV Partial Leverage Plot
For MTO Male Youth:

Risky Behaviors
Vs. School Climate
Controlling for
Neighborhood Poverty
And Site Fixed Effects

Site*Treatment Group
As instruments for
School climate index
and tract share poor

p=.01 for slope coefficient
of School Climate
School Quality Evidence I

• Public School Choice – Longer Run Impacts:
  – Deming (2011 QJE) and Deming et al. (2014 AER) use CMS school choice lottery – medium-term follow-up shows higher school quality lowers crime and increases college attainment for low-income & minority students

• Charter School Entrance Lottery Evidence – Longer run evidence from Harlem Children’s Zone (Fryer and Dobbie)
  – Boston Charter Schools from Angrist et al. (2013) find impacts on AP exams, SAT scores, and college going

• Fryer (2014 QJE, forthcoming): Injecting Charter School Best Practices into Public Schools in Houston, Denver, and Chicago with Short-Run Impacts
**School Quality Evidence II**

- **Class Size**: Tennessee Project STAR Randomized Class Size Experiment in K-3 positive impacts on test scores (Krueger 1999 QJE) and longer-run impacts on college going and adult outcome index at age 27 linking to IRS tax data (Chetty et al. QJE 2011)
  - Class size impacts largest for minority and free lunch students
  - Fredriksson et al. (2013 QJE) using RD strategy and Swedish maximum class size rule finds positive impacts of smaller class size on adult earnings at ages 27 to 42
  - These estimates hold teacher quality constant but general equilibrium issues of whether smaller class sizes dilute teacher quality as in California class size reduction experience (Jepsen and Rivkin JHR 2009)
  - But Card-Krueger (1992a,b) historical evidence show substantial impacts on adult earnings of state level persistent reductions in class size in K12 – gets a GE effects from state aggregate variation
School Quality Evidence III

- **Teacher Quality**: Chetty et al. (2011 QJE) use Project STAR RA & find more experienced teachers in K-3 have a positive impact on adult wages – Hanushek review pieces as well
  - Chetty, Friedman and Rockoff (2013 NBER WP) – cross-section and teacher turnover-based estimates of teacher quality (measured by teacher value-added) on adult outcomes linking public school administrative data for large urban school district to IRS tax data
  - Find substantial impacts on adult earnings, college going, & college quality of a high Value-Added Teacher in grades 4-8
  - Positive impacts for girls and boys, high and low income, minority and nonminority children

- Implication: \( \frac{\partial f^j}{\partial \sigma} > 0 \)
Neighborhood & Schools: Harlem Children’s Zone (HCZ) Evidence

Key HCZ references:


HCZ Evidence

• Dobbie and Fryer (2012) look at medium-term outcomes 6 years after random admissions lottery to Promise Academy charter school in a follow-up survey plus NYC School and NSC data

• Lottery winners have large increase in math achievement (0.283 SD), college enrollment (14.1 percentage points), females are 12.1 percentage points less likely to be teen mothers, and males 4.3 percentage points less likely to be incarcerated -- ITT estimates

• Promise Academy access improves human capital index, reduces risky behavior index, and no impact on health index
  – Evidence that $\frac{\partial f_j}{\partial \sigma} > 0$ for human capital and risky behavior and $= 0$ for health

• Lottery impacts similar for in-zone and out-of-zone youth suggesting little interaction effect of schools & nghds

• No impact of being in zone for lottery losers at zone border consistent with little or no direct neighborhood effects
HCZ Promise Academy ITT Impacts

College-Going

Enrolled in College
Enrolled in 4-year College

Military Health
Physical Health Index
Nutrition Index

Health Outcomes

Woodcock Johnson

Math
Reading

Social Outcomes (Odds Ratios)

Pregnancy (Girls)
Incarceration (Boys)
Table 6
The Impact of Attending the Promise Academy
Inside and Outside the Zone

<table>
<thead>
<tr>
<th></th>
<th>Inside Zone (1)</th>
<th>Outside Zone (2)</th>
<th>p-value (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Capital Index</td>
<td>0.281**</td>
<td>0.268***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.124)</td>
<td>(0.077)</td>
<td>0.918</td>
</tr>
<tr>
<td></td>
<td>147</td>
<td>361</td>
<td></td>
</tr>
<tr>
<td>Risky Behavior Index</td>
<td>-0.127</td>
<td>-0.135*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.103)</td>
<td>(0.077)</td>
<td>0.932</td>
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<tr>
<td></td>
<td>122</td>
<td>315</td>
<td></td>
</tr>
<tr>
<td>Health Index</td>
<td>0.045</td>
<td>0.034</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.094)</td>
<td>(0.062)</td>
<td>0.907</td>
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<td></td>
<td>112</td>
<td>287</td>
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</tr>
</tbody>
</table>
Conclusions I

• Micro Neighborhood conditions have substantial impacts on adult well-being and health and female youth mental and physical health

• Micro Neighborhood environments in the range affected by housing vouchers have little impact on children’s education, economic, or risky behavior outcomes unless they lead to large increases in school quality

\[
\frac{\partial f^{human\ capital}}{\partial \eta} \approx 0 \text{ for males and females}
\]

\[
\frac{\partial f^{health}}{\partial \eta} > 0 \text{ for females}
\]
Conclusions II

- School quality improvements have large positive effects on youth human capital, labor market, and risky behavior outcomes.
- But little direct medium-term impact on youth health from school quality.
- Neighborhoods matter more for health inequalities and matter a lot for well-being.
- Schools matter more for achievement gaps, poverty, and economic inequality.
Conclusions III

• How can one bring school quality changes (charter schools, teacher quality ...) to scale??
  – General equilibrium effect issues
  – Can one increase supply of talented teachers, principals, and school practices?

• G.E. and political economy effects on school quality for low-income students of changes in neighborhood economic segregation

• Micro vs. Macro impacts of neighborhoods

• Chetty et al. (2014) on neighborhood segregation and upward mobility at MSA level; Cutler-Glaeser (1997), WJ Wilson (1987)