

# The Impact of Charter Schools on Student Achievement: A Study of Students Who Attend Schools Chartered by the Chicago Charter School Foundation

Caroline M. Hoxby

Jonah E. Rockoff

Harvard University,

National Bureau of Economic Research

with research support from NICHD grant R29HD35983

# Study Design

- We compare students in the three oldest Chicago International Charter School (CICS) schools to equivalent students in the Chicago Public Schools (CPS).
- All students in the study applied to CICS schools but some were “lotteried-in” in random admissions lotteries. Others were “lotteried-out.”
- Lotteried-in and lotteried-out students are comparable in terms of family background, prior achievement, and motivation.

# We Analyze Students who Applied to One of the Three Oldest CICS Schools

1. Longwood (K-12)
  2. Bucktown (K-8)
  3. Prairie (K-8)
- We follow students who participated in the applicant lotteries held in spring 2000, 2001, and 2002 (for school entry in the subsequent autumn).

# Randomization Solves the “Self-Selection” Problem

- The key challenge for research on charter schools is that students who apply may be different in background, achievement, or motivation than those who do not apply.
- By comparing lotteried-in and lotteried-out applicants, we overcome the self-selection problem.
- CICS and CPS students in the study are equal in terms of background, initial achievement, and motivation.

# Other Aspects of the Study Design

- We show the effect of enrolling in a CICS school (the “treatment on the treated” effect).
- In appendices, we also show the effects of being offered a place at a CICS school (the “intention to treat” effect).
- We focus on students who applied to CICS from a CPS school.
  - For these students, we have data on over 80% of the lotteried-out.
  - For these students, there is no differential attrition of the lotteried-out.
  - For applicants to kindergarten and grade 1, we examine all students because most have no prior school.
- The study design guarantees highly credible results.

# How Do the CICS Students Compare to CPS Students?

- CICS Students\*
  - 74% black
  - 22% Hispanic
  - 81% free/reduced price lunch
  - 10% special education
  - 16% bilingual education
- All CPS Students
  - 51% black
  - 36% Hispanic
  - 78% free/reduced price lunch
  - 12% special education
  - 14% bilingual education

\*in our sample

*CICS students are more likely to be black and less likely to be Hispanic, but on other dimensions they are similar to CPS students.*

# How do Longwood Students Compare to Longwood's Neighborhood?

- The Longwood neighborhood is more black and more poor than Chicago as a whole.
- Given their neighborhood, Longwood students are disproportionately likely to be poor.

Longwood students*	Longwood Neighborhood	Chicago
99% black	98% black	37% black
1% Hispanic	2% Hispanic	26% Hispanic
81% on free or reduced-price lunch	6% poor	17% poor

\* In our sample.

# How do Bucktown Students Compare to Bucktown's Neighborhood?

- The Bucktown neighborhood is less black and less poor than Chicago as a whole.
- Given their neighborhood, Bucktown students are very disproportionately likely to be black, Hispanic, and poor.

Bucktown students*	Bucktown Neighborhood	Chicago
33% black	2% black	37% black
54% Hispanic	23% Hispanic	26% Hispanic
67% on free or reduced-price lunch	7% poor	17% poor

\* In our sample.



# How do Prairie Students Compare to Prairie's Neighborhood?

- The Prairie neighborhood is more black, more Hispanic, and more poor than Chicago as a whole.
- Given their neighborhood, Prairie students are disproportionately likely to be Hispanic and poor.

Prairie students*	Prairie Neighborhood	Chicago
55% black	56% black	37% black
44% Hispanic	41% Hispanic	26% Hispanic
84% on free or reduced-price lunch	31% poor	17% poor

\* In our sample.

# About the Lotteries

- 81% of lotteried-out students who apply to CICS from a CPS school can be matched to their CPS records.
- About 60% of students who apply to CICS from a private school or other non-CPS school can be matched to their (old) CPS records.
- There is no differential attrition from the sample by lotteried-out students.
  - Lotteried-out students who attrit have the same initial test scores as lotteried-in students who attrit.

# The Lotteries *Are* Random

- Compared to the lotteried-out CPS students, the lotteried-in CICS students do *not* differ on:
  - Initial math or reading scores
  - Special education classification
  - Bilingual education classification
  - Race/ethnicity
  - Participation in free/reduced-price lunch

# Longwood Does Not Cream-Skim

	Longwood	Schools Near Longwood
% black*	99%	93%
% Hispanic*	1%	2%
% free/reduced-price lunch*	82%	83%
% special education*	12%	15%
% bilingual education*	1%	0%
Initial math percentile*	37	42
Initial reading percentile*	39	38

\* Based on students in our sample, using consistent classification from CPS

# Bucktown Does Not Cream-Skim

	Bucktown	Schools Near Bucktown
% black*	33%	40%
% Hispanic*	53%	47%
% free/reduced-price lunch*	77%	81%
% special education*	11%	14%
% bilingual education*	36%	16%
Initial math percentile*	46	54
Initial reading percentile*	46	47

\* Based on students in our sample, using consistent classification from CPS

# Prairie Does Not Cream-Skim But is More Like its *Immediate* Neighborhood than other CICS Schools\*

	Prairie	Schools Near Prairie
% black**	54%	92%
% Hispanic**	44%	4%
% free/reduced-price lunch**	84%	90%
% special education**	3%	14%
% bilingual education**	38%	1%
Initial math percentile**	43	41
Initial reading percentile**	40	36

\* See a previous slide for statistics on Prairie's immediate neighborhood. \*\*Based on students in our sample, using consistent classification from CPS.

# Achievement Effects\* of CICS Schools - Overall

## Math (Iowa Test of Basic Skills):

+ 2.0 percentile points per year  
(a statistically *insignificant* gain)

## Reading (Iowa Test of Basic Skills):

+ 4.2 percentile points per year  
(a statistically significant gain)

\* Difference between lotteried-in CICS students and lotteried-out CPS students.  
Treatment on the treated effect is shown.

# Achievement Effects\* of CICS Schools – By Grade in Which Student Applied

## Math (Iowa Test of Basic Skills):

- Applied as K-1: 1.5 percentile points per year (statistically *insignificant*)
- Applied as 2-3: 9.9 percentile points per year (statistically significant)
- Applied as 4-5: 1.2 percentile points per year (statistically *insignificant*)

## Reading (Iowa Test of Basic Skills):

- Applied as K-1: 8.7 percentile points per year (statistically significant)
- Applied as 2-3: 4.5 percentile points per year (statistically significant)
- Applied as 4-5: -2.2 percentile points per year (statistically *insignificant*)

\* Difference between lotteried-in CICS students and lotteried-out CPS students. Treatment on the treated effect is shown.



# Other Results

- On the whole, more recent entrants to CICS schools have had larger gains in reading and math, relative to lotteried-out CPS students.
- The later a student enters CICS, the less likely it is that his or her gains are significant, relative to lotteried-out CPS students
- Are reading gains are larger than math gains because CICS schools teach reading better or because lower grade students focus more on reading?
  - We'll know when we have more years of data on each student.

# Conclusions

- CICS students who enter in early grades (K-3) have very substantial gains in reading and smaller gains in math.
- These gains are relative to randomly lotteried-out CPS students, who are equivalent in background & motivation.
- Going forward, most CICS students will enter in the early grades, so it's not very useful to focus on students who entered late grades.