

Opportunities and Limitations of Data Use in Educational Practice

Sean P. Corcoran
New York University
April 1, 2014

Introduction

- About me: economist of education, but with a focus on K-12, and New York City in particular
- My research: school funding, teacher labor markets, measures of teacher effectiveness, school choice
- This morning: opportunities—and limitations—of data use for improving student outcomes; some examples from my own research at NYU using administrative data

What do we mean by *data*?

- *Data* may be today's buzzword, but it is nothing really new to education
 - Empirical measures/observations
 - Collected systematically
 - Quantitative or qualitative in nature
 - Summarized in some meaningful way to make inferences, predictions, generalizations, or to classify or evaluate
- What is new is our capacity to collect, store, process, and share data, and in turn the potential *uses* for it

A short history of educational data

- 1840s: first large-scale achievement tests in the U.S.
- 1950s: modern era of standardized testing (e.g., ITBS, SAT, IQ)
- 1960s: Title I and NAEP
- 1971: first state-wide exit exam
- 1980s: *A Nation at Risk* and state accountability systems
- 2002: No Child Left Behind
- 2009: Race to the Top

Reference: Koretz (2008)

The new demands on educational data

- The past 40 years have seen significant changes in the use of educational data and the demands placed on it
- Early achievement tests: often low-stakes diagnostics of student learning or aptitude
- Modern uses: inferences about *groups*—such as schools, districts, or programs—rather than individual students
 - Measuring *growth* on a scale over time
 - Measuring achievement relative to some fixed standard

The new demands on educational data

- Examples:

- Achievement gaps
- Proficiency in reading and mathematics
- School effectiveness (e.g., school progress reports)
- “College readiness”
- Post-secondary institution rating system (PIRS)
- Teacher “value-added”
- Evaluating teacher preparation programs

The many uses of data in education

- Improving **service** provision; information sharing
- Assessing **student needs and learning**, matching students to appropriate services and curriculum
- Tracking **student progress**; early warning indicators
- Monitoring system or organizational **performance**
- Measuring system or organizational **improvement**
- Assessing the **relative quality** or effectiveness of schools, teachers, or programs
- Holding educators **accountable** for performance
- Evaluating **impact**

High School of Telecommunication Arts and Technology

PRINCIPAL: Philip Weinberg

DBN: 20K485

ENROLLMENT: 1292

SCHOOL TYPE: High School

PERCENTILES AND GRADES FOR PREVIOUS YEARS

	2010	2011	2012
PERCENTILE:	80	87	87
GRADE:	A	A	A

KEY DEMOGRAPHIC INDICATORS

%BLACK OR HISPANIC	%ELL	%IEP	% OVERAGE
63.2%	5.5%	24.1%	2.4%

PROGRESS REPORT

A	OVERALL SCORE	OUT	OVERALL PERCENTILE RANK	This school's overall score is greater than or equal to that of 83.2 percent of HS schools.
	77.0	of 100	83	

For high schools, grades are based on out scores determined prior to the release of the Progress Report. Further, schools with a four year graduation rate in the top third citywide cannot receive a grade lower than a C. Schools in their first year, without a graduating class or in phase out receive a report with no grade or score.

Progress Report Grades - High School







GRADE	SCORE RANGE	% OF SCHOOLS
A	70.0 or higher	33% of schools
B	58.0 - 69.9	36% of schools
C	47.0 - 57.9	21% of schools
D	40.0 - 46.9	6% of schools
F	39.9 or lower	5% of schools

QUALITY REVIEW
Outstanding (2007-08)

The rating is based on three major categories of school performance: instruction that prepares students for college and careers, school organization and management, and quality of the learning environment.

<http://schools.nyc.gov/Accountability/Tools/Review>

Overview Each school's Progress Report (1) measures the student year-to-year progress, (2) compares the school to peer schools, and (3) rewards success in moving all children forward, especially children with the greatest needs.

CATEGORY	SCORE		GRADE	DESCRIPTION
School Progress	35.9 out of 55		B	Student Progress measures the annual progress students make toward meeting the state's graduation requirements by earning course credits and passing state Regents exams.
School Performance	14.3 out of 20		B	Student Performance measures how many students graduated within 4 and 6 years of starting high school, and the types of diplomas they earned.
School Environment	11.9 out of 15		A	School Environment measures student attendance and a survey of the school community rating academic expectations, safety and respect, communication, and engagement.
College and Career Readiness	8.1 out of 10		A	College and Career Readiness measures how well students are prepared for life after high school on the basis of passing advanced courses, meeting English and math standards, and enrolling in a post-secondary institution.
Closing the Achievement Gap	6.8 out of 16			Schools receive additional credit for exceptional graduation and college/career readiness outcomes of students with disabilities, English Language Learners, and students who enter high school at a low performance level.
Overall Score	77.0 out of 100		A	The overall grade is based on the total of all scores above. Category scores may not add up to total score because of rounding.

GRADE	B	GRADE	SCORE RANGE
		A	36.0 or higher
		B	27.9 - 35.9
SCORE		C	19.5 - 27.8
		D	15.4 - 19.4
		F	15.3 or lower
	29.1		
	(out of 60)		

Student Progress represents 60% of the total score. The grade is based on growth percentiles, a measure of how much individual students improved on state tests in English and Math between 2012 and 2013, and on early grade progress, a weighted measure of 3rd grade students' test results based on their demographic indicators of need.

	THIS SCHOOL'S RESULTS	COMPARISON TO PEER SCHOOLS (WEIGHTED 75%)	PERCENT OF PEER RANGE	COMPARISON TO CITY SCHOOLS (WEIGHTED 25%)	PERCENT OF CITY RANGE	POINTS POSSIBLE	POINTS EARNED
English							
Median Adjusted Growth Percentile (n=237)	61.0		46.6%		40.8%	10.00	4.52
Median Adjusted Growth Percentile for School's Lowest Third (n=94)	73.0		59.8%		43.2%	10.00	5.57
Early Grade Progress (n=114)	2.13		49.0%		57.4%	10.00	5.11
Mathematics							
Median Adjusted Growth Percentile (n=238)	62.0		44.4%		48.1%	10.00	4.53
Median Adjusted Growth Percentile for School's Lowest Third (n=85)	72.0		50.6%		44.5%	10.00	4.91
Early Grade Progress (n=114)	2.17		44.4%		46.9%	10.00	4.50



College Affordability and Transparency Center

College Scorecard

College Scorecards in the U.S. Department of Education's College Affordability and Transparency Center make it easier for you to search for a college that is a good fit for you. You can use the College Scorecard to find out more about a college's affordability and value so you can make more informed decisions about which college to attend.

To start, enter the name of a college of interest to you or select factors that are important in your college search. You can find scorecards for colleges based on factors such as programs or majors offered, location, and enrollment size.

Search for a college by name...

Choose from the following options to begin searching for colleges of interest to you by:



College Location



Type of College



My Area of Interest



Popular Criteria

MY AREA OF INTEREST

Degree & Major



MY AREA OF INTEREST

Occupation



COLLEGE LOCATION

Zip Code



TYPE OF COLLEGE

Size

MY AREA OF INTEREST

Awards Offered

COLLEGE LOCATION

State

HELP

About the Scorecard

New York University

New York, NY

Primarily bachelor's degree granting

Undergraduate enrollment: 22,280

 [Back to Search](#)

 [More Information](#)

 [Print Profile](#)


Costs





\$36,834 / yr

What does it typically cost to attend New York University?

The average net price for undergraduate students is \$36,834 per year. Net price is what undergraduate students pay after grants and scholarships (financial aid you don't have to pay back) are subtracted from the institution's cost of attendance.

The average net price has **decreased 2.6%**  from 2007 to 2009.

 [Click here to see listings of changes in college costs.](#)

 [Click here to go to the Net Price Calculator for a better estimate of what your costs would be.](#)

Graduation Rate



What percentage of students graduate?

86.4% of full-time students received their bachelor's degree within 6 years. Graduation rate data are based on undergraduate students who enrolled full-time and have never enrolled in college before. This may not represent all undergraduates that attend this institution.

Loan Default Rate



13.4%

Are students able to repay their loans after they graduate?

2.8% of borrowers defaulted on their Federal student loans within three

The many uses of data in education

- Most of the above uses of data in education involve an *inference* about some construct we care about
 - Rarely are we interested in data for its own sake
 - Some inferences are more demanding of the data and analytical methods than others
- Our capacity for collecting and reporting data is growing faster than our capacity for making intelligent use of it
 - Data are only as good as the uses to which it is put!

Using data properly

- Can the data **support the inference** being made?
- Are the measures **appropriate**? Would other, similar measures tell the same story?
- How **reliable** are the data? How much uncertainty is associated with the inference?
- The **stakes attached** to data should be inversely related to its reliability.

Using data properly

- **Descriptive** vs. **causal** uses of data
 - Performing monitoring and reporting
 - Hypothesis generation
 - Identifying opportunities for intervention
 - Attribution of responsibility
- Many uses of data in education have a **causal** connotation:
 - Performance improvement
 - Relative effectiveness; holding schools “accountable”
 - Teachers’ “value-added”
 - Evaluating impact

Using data properly – advice

- **Don't overreach** – be clear (and realistic) about what your data can tell you and what it can't
- **Don't *under-reach*** – not all analyses need to be sophisticated or satisfy the high demands of causality
- **Acknowledge uncertainty** inherent in any measure or statistical analysis
- **Know your data** and its limitations

Using data properly – advice

- **Retain** and **thoroughly document** your data and data collection procedures. Even if you have no immediate plans for retrospective evaluation, you may someday!
- **Exploratory, descriptive** analyses are extremely helpful for identifying intervention opportunities and uncovering the unexpected.
- Data should be a **starting point** for conversation and action, not an end-in-itself.

Education policy research at NYU

- **Institute for Education and Social Policy (IESP)** – a joint research center of the NYU Steinhardt and Wagner schools
- **The Research Alliance for NYC Schools (RANYCS)** – an independent research center formed with cooperation of the NYC DOE
- **The Metropolitan Center for Research on Equity and the Transformation of Schools**

Education policy research at NYU

- Data library:

- Student-level administrative data on demographics, test scores, attendance, suspensions, school choices, etc.
- College enrollment data from the National Student Clearinghouse
- NYC School Survey data – teachers, students, parents
- School-level data on expenditures, enrollment, selectivity, outcomes (e.g. graduation rates)
- Human resources data for teachers, principals
- Ancillary data on school programs (e.g. school food), student fitness, census and housing data

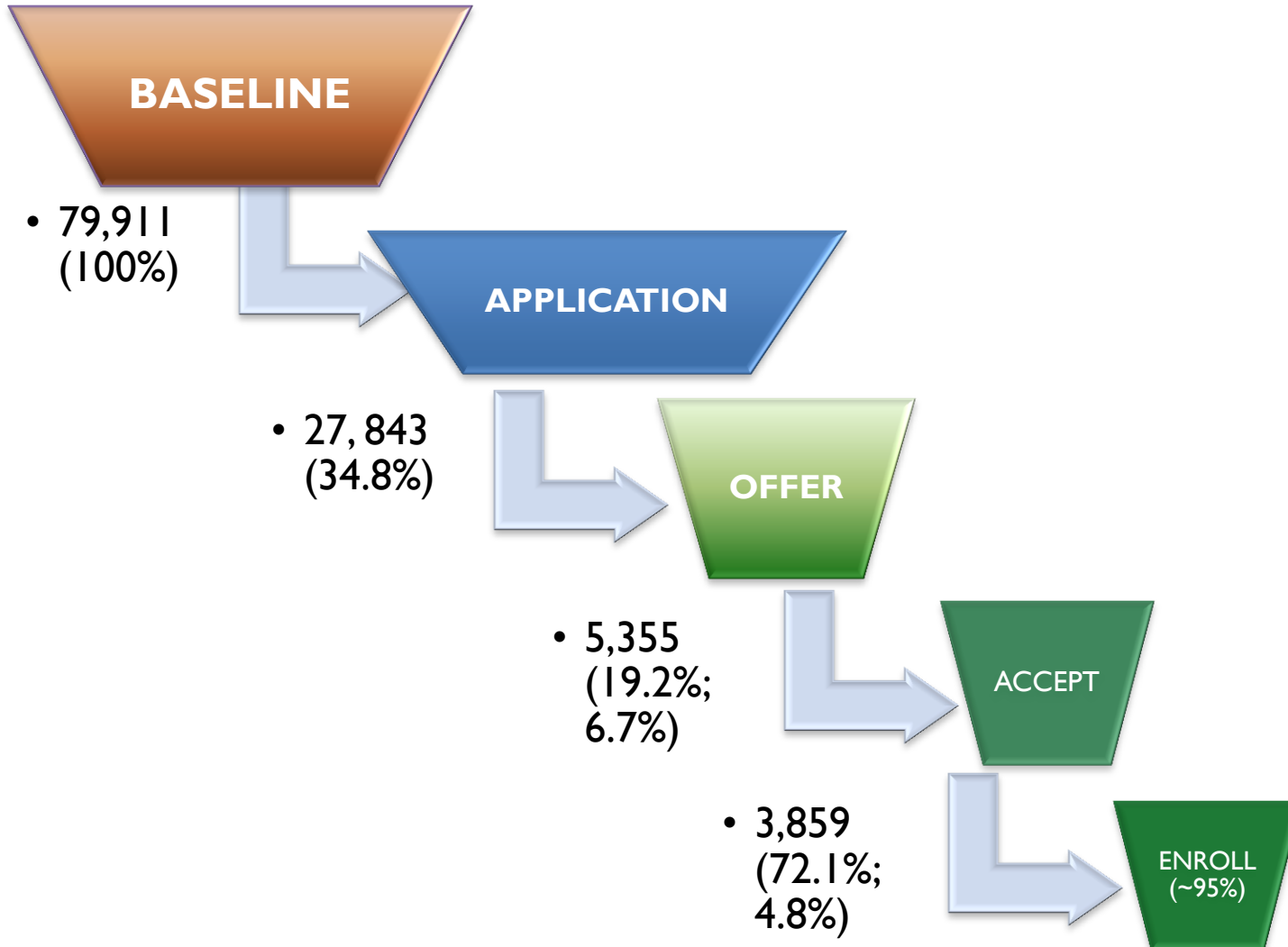
Sampling of projects

- IESP:
 - Achievement of students in public housing
 - Impact of foreclosures on student mobility, educational outcomes, and crime
 - Effects of neighborhood crime on educational outcomes
 - Impact and cost effectiveness of small high schools
 - Evaluation of principals trained through the NYC Leadership Academy
 - Educational trajectories of recent immigrant students

Sampling of projects

- RANYCS:
 - Effects of high school closure
 - Evaluating and improving upon the high school on-track indicator
 - Patterns of middle school teacher turnover
 - Study of ARIS usage and roll-out
 - Evaluation of the Expanded Success Initiative
 - Pipeline of admissions to the specialized high schools
 - School choices and placements of low-achieving students

Pipeline of admissions into specialized schools



Pipeline of admissions into specialized schools

	Baseline	Applied to SPHS	Offered a SPHS	Accepted SPHS offer
<u>Borough of residence:</u>				
Brooklyn	31.8	35.9	32.1	34.1
Manhattan	11.7	11.5	15.8	14.4
Queens	27.2	30.6	39.1	38.3
Staten Island	6.2	5.8	6.7	6.9
Bronx	23.2	16.2	6.3	6.4
Charter middle school	0.8	1.5	0.5	0.4
Female	49.1	50.7	45.6	42.1
Asian	13.9	28.9	53.5	59.3
Black	32.5	27.7	7.7	7.6
Hispanic	39.7	24.6	8.7	7.9
White	13.3	18.2	29.6	24.8
N	516,979	150,858	28,486	21,698

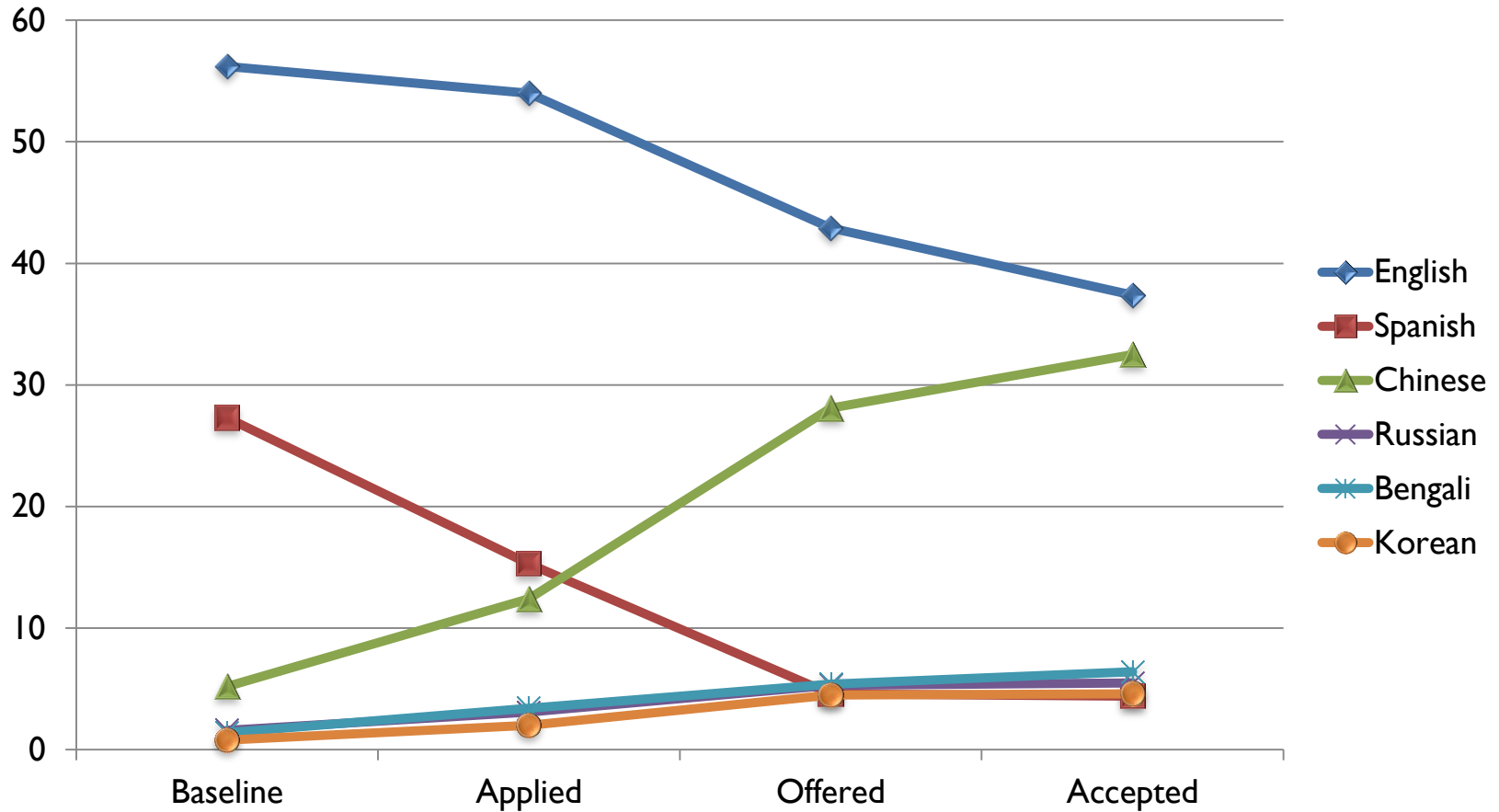
Note: results are preliminary and unreleased. Not for citation or distribution.

Pipeline of admissions into specialized schools

	Baseline	Applied to SPHS	Offered a SPHS	Accepted SPHS offer
Special education	6.2	0.5	0.0	0.0
ELL (HSAP)	11.8	3.5	0.4	0.4
Immigrant	17.3	16.7	16.2	17.5
Low income	58.5	49.4	34.8	37.1
Attendance rate, 8 th grade	90.7	94.7	96.4	96.5
Age	14.1	13.9	13.8	13.8
Absent >30 days	9.1	2.1	0.4	0.4
Absent 20-30 days	10.7	4.9	1.5	1.6
Late >30 days	15.5	7.1	1.7	1.9
# of choices (trad. choice)	7.4	7.5	6.3	6.3
Reading z-score (8 th)	0.009	0.665	1.559	1.531
Math z-score (8 th)	0.008	0.747	1.670	1.701
Top 2% in ELA	3.0	8.3	27.2	25.7
N	516,979	150,858	28,486	21,698

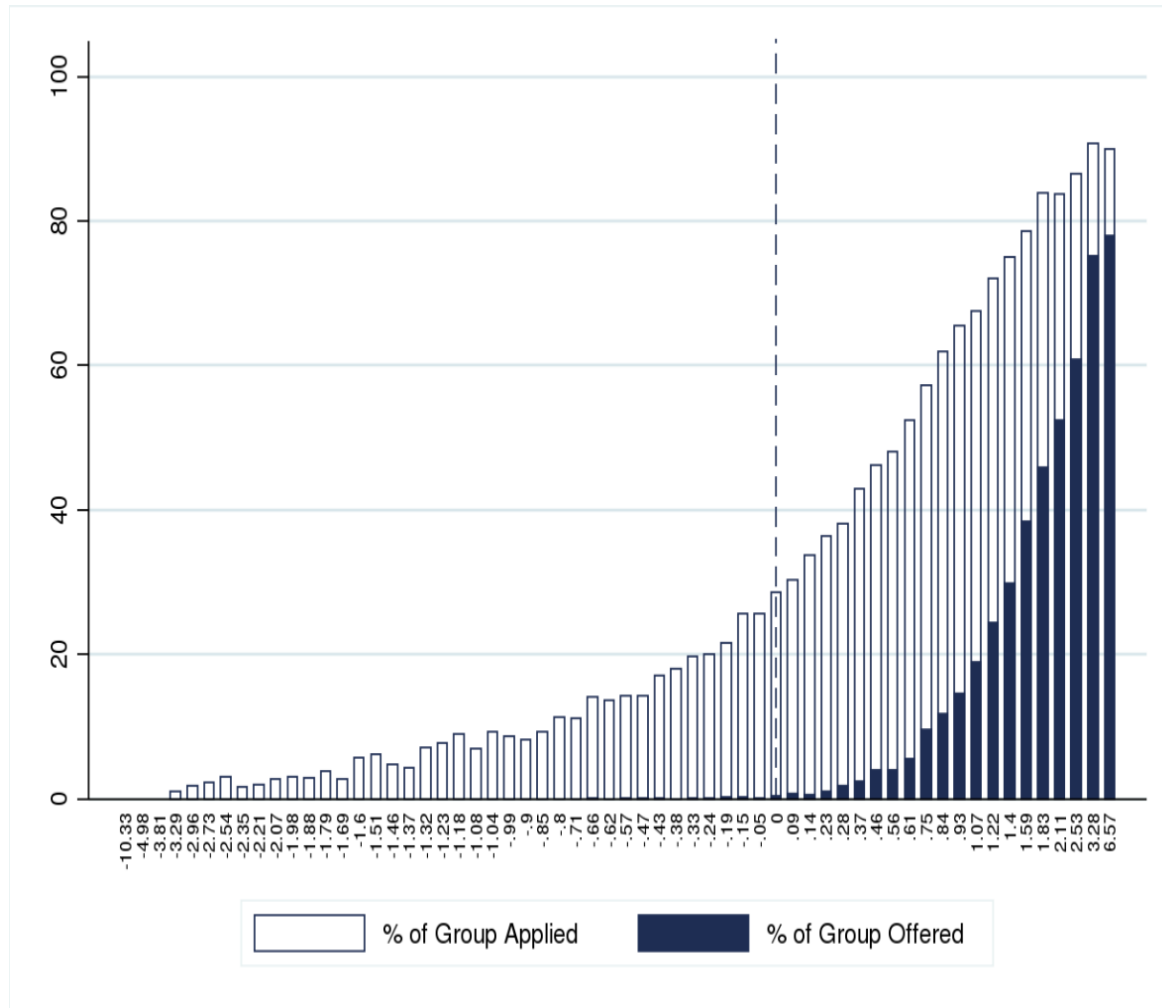
Note: results are preliminary and unreleased. Not for citation or distribution.

By language spoken at home



Note: results are preliminary and unreleased. Not for citation or distribution.

By achievement score



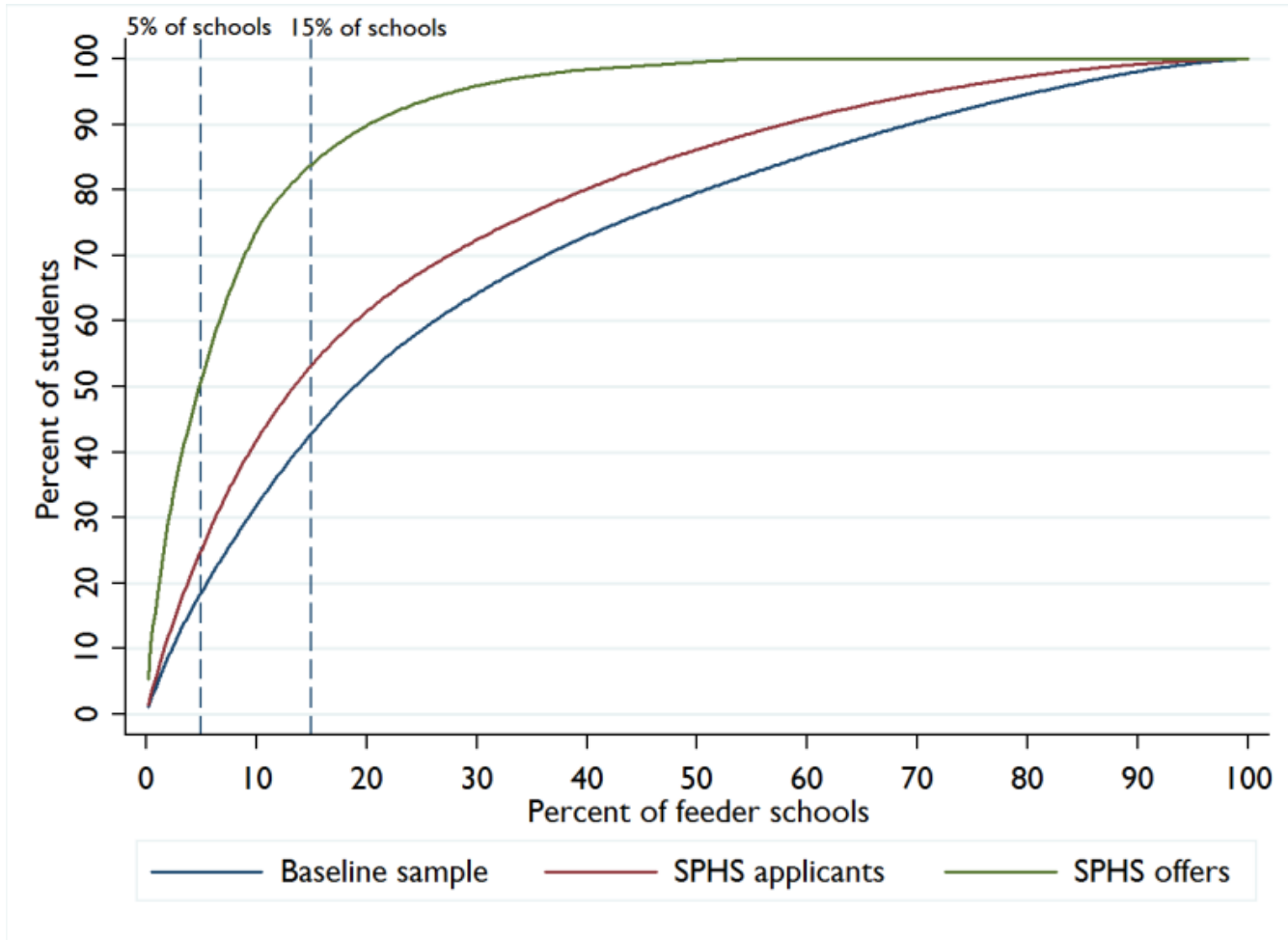
Note: results are preliminary and unreleased. Not for citation or distribution.

Factors related to application, offers, acceptance



Note: results are preliminary and unreleased. Not for citation or distribution.

Representation of “feeder” middle schools



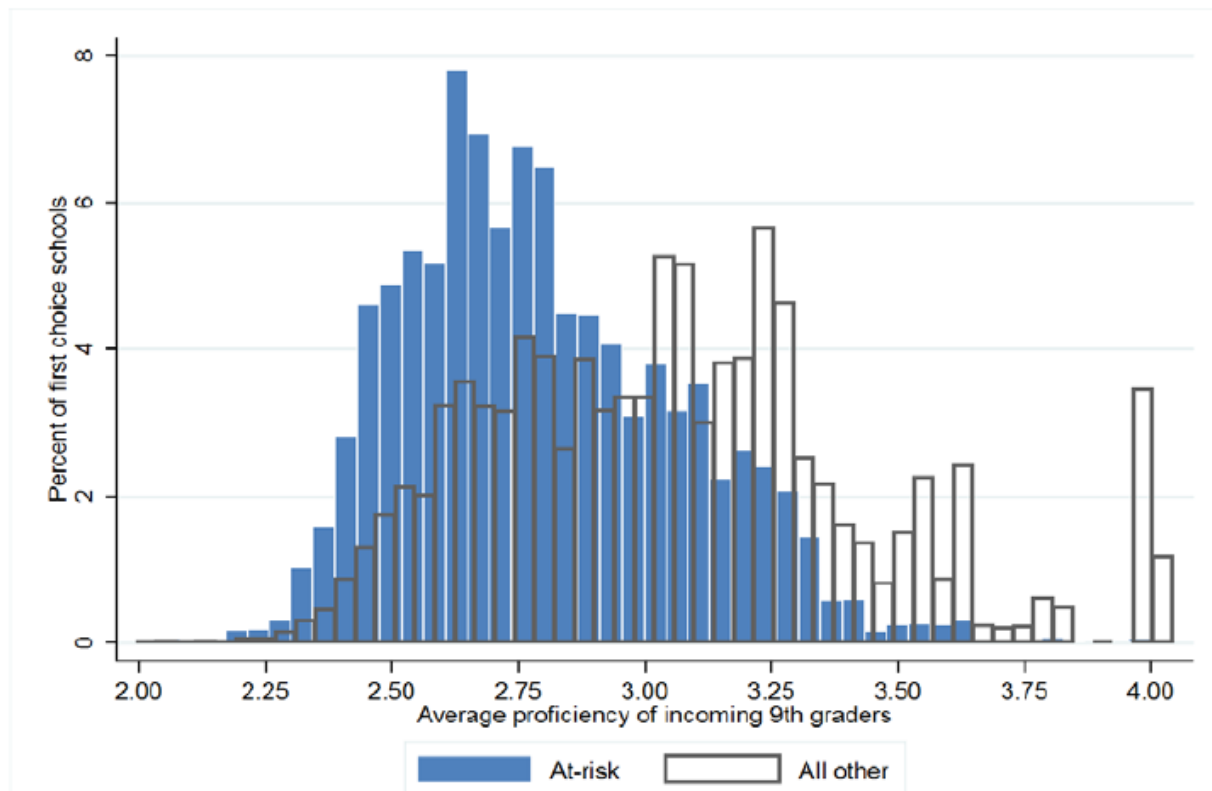
Note: results are preliminary and unreleased. Not for citation or distribution.

School choices of low-achieving students

- Low-achieving middle school students in NYC enroll in more disadvantaged (and lower achieving) high schools than their higher achieving counterparts; they also expressed *preferences* to attend these schools (Nathanson, Corcoran, and Baker-Smith, 2013).
- There may be opportunities to improve access to high-quality schools through **informational** interventions

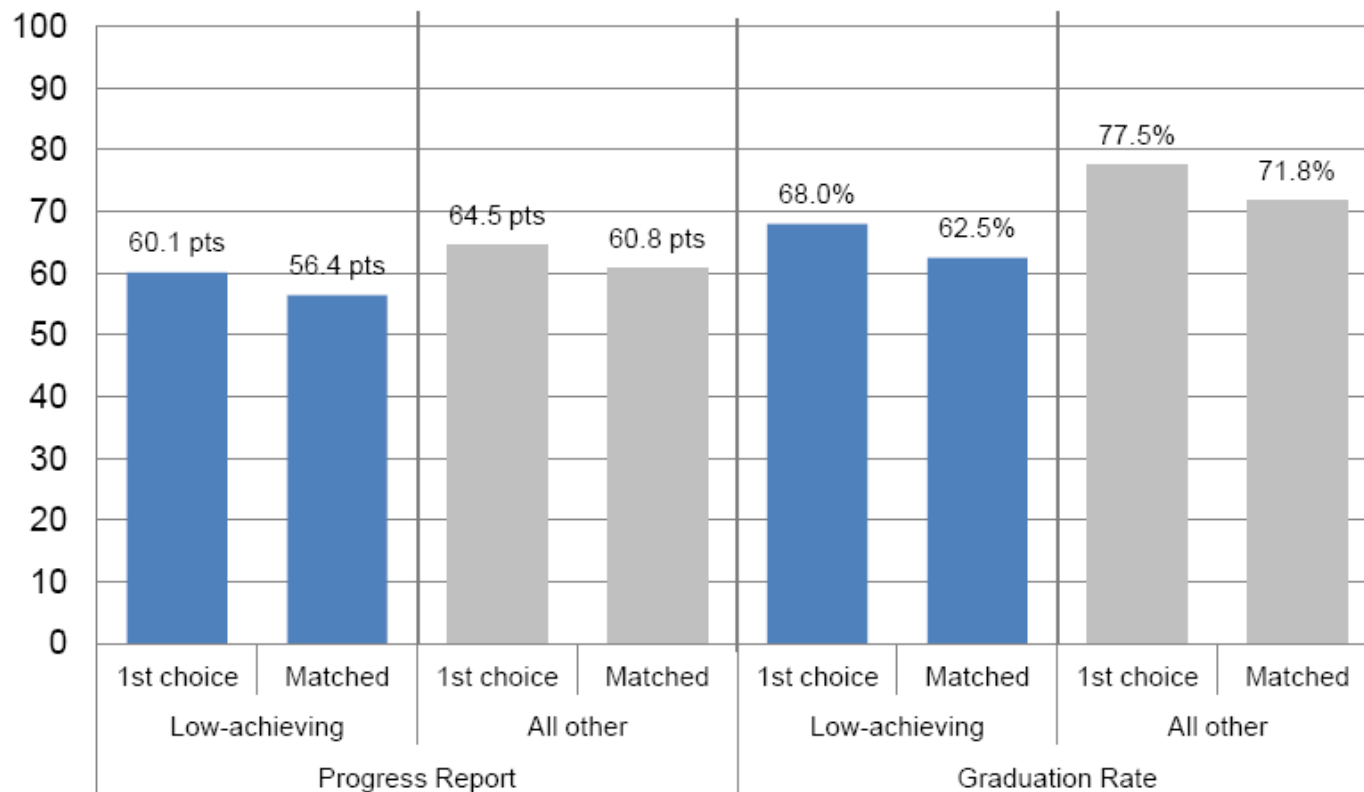
School choices of low-achieving students

Figure 10: Average 8th Grade Proficiency in ELA and Math of Incoming 9th Graders at First-Choice High Schools, 2008-2011



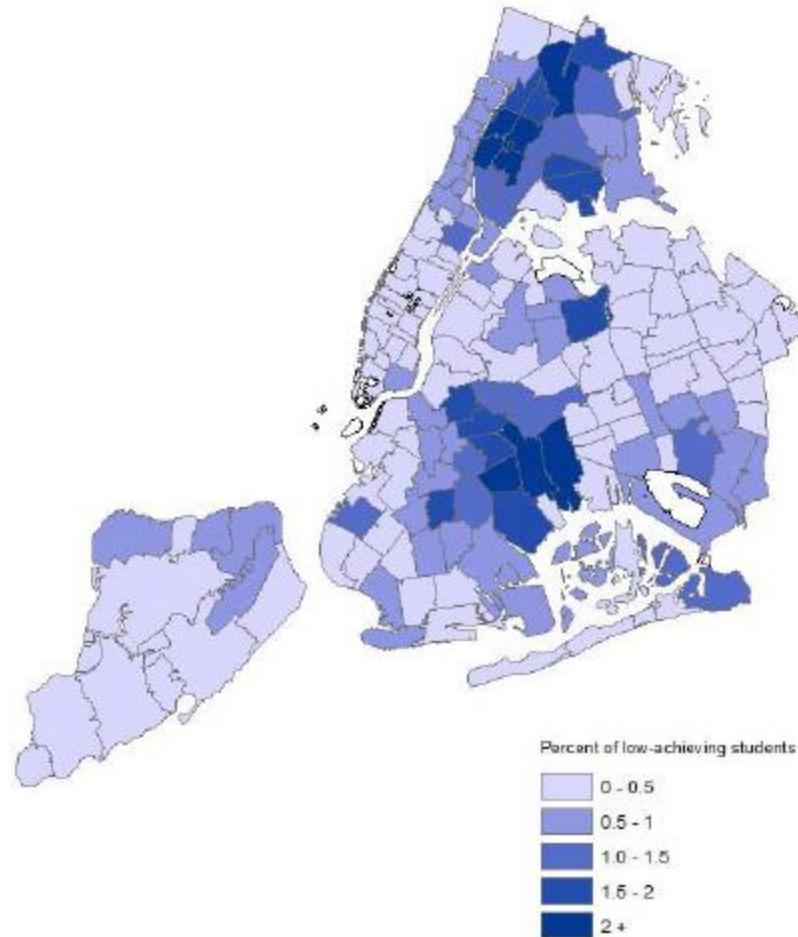
School choices of low-achieving students

Figure ES-1: Average Academic Performance of First-Choice and Matched Schools, for Low-Achieving and All Other Students, 2007-2011



School choices of low-achieving students

Figure 6: Geographic Distribution of Low-Achieving Students by Residential Zip Code, 2011

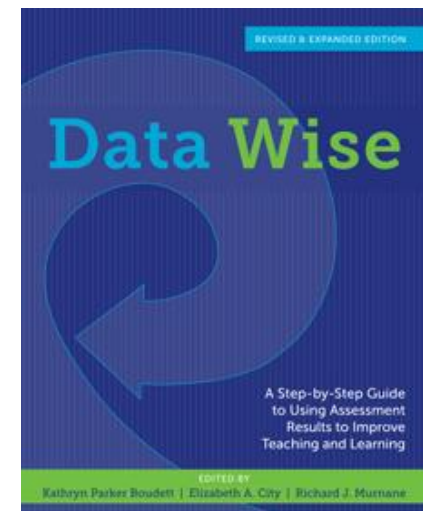
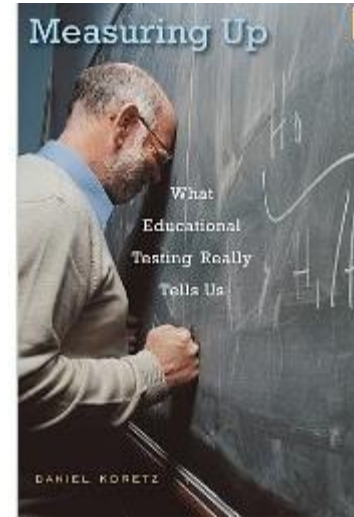


Questions for the panel

- What data do you use regularly? What data do you collect yourself?
- How do you use data in your organization?
 - Enhancing service provision
 - Matching students to appropriate services
 - Performance monitoring
 - Impact evaluation
- Do you drive the data, or does the data drive you?

Recommended Resources

- Daniel Koretz (2008) *Measuring Up: What Educational Testing Really Tells Us*. Harvard University Press
- Harvard Data Wise Project:
<http://www.gse.harvard.edu/datawise/>
- Harvard Strategic Data Project:
<http://www.gse.harvard.edu/sdp/>
- NYU – IESP (<http://steinhardt.nyu.edu/iesp/>)
- Research Alliance for NYC Schools
(http://steinhardt.nyu.edu/research_alliance/)



Recommended Resources

- Nathanson, Corcoran, and Baker-Smith report on the school choices and placements of low-achieving students (<http://media.ranycs.org/2013/008>)

