

What's in a review? Using text analysis to understand how parents value schools

Caitlin Kearns

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Summary

- Parents often choose from a variety of school options, but there is limited information on which school characteristics parents value most
- School reviews provide a large-scale source of information on how parents value schools
- I use structural topic modelling (STM) to identify the most prevalent themes in school reviews from New York City
- Preliminary results show significant differences in topic proportions by school type (public, private, charter)

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Parents in urban districts have a variety of school options

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- Traditional district schools
- Charter schools
- Private schools
- Other models: Magnets, pilot schools, small learning communities, career academies

Choice has expanded in some large urban districts

- District options traditionally tied to residential address, but choice has expanded:
 - New York: Implemented universal high school choice after 2004
 - New Orleans: Converted to all-choice charter school system after Hurricane Katrina
 - Los Angeles: Introduced high school Zones of Choice starting in 2008
- Growth of charters
- Vouchers expand access to private schools (e.g. Indiana, Milwaukee)

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Parents can take many factors into account when choosing schools

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- Academics: Test scores, advanced courses, graduation rates, college placement
- Student demographics: Race/ethnicity, parent income, parent education
- Extracurriculars: Athletics, team competitions
- Convenience: Distance, availability of transportation
- Cost: Housing costs, tuition, school fees, pressure to donate
- Community: Relationships with teachers and staff, PTA
- Student support: For students with disabilities, English language learners, gifted students
- Others: Safety, quality of facilities

Parents receive school information from a variety of sources

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- Official district channels
 - District mailings and website, meetings and presentations, school tours, school counselors
- Marketing
 - Advertisements sent by mail, displayed in public spaces
- Word of mouth
 - In-person interactions with parents, online forums
- Third party sources
 - School rating and review websites (GreatSchools, SchoolDigger, Niche)

Researchers have used several data sources to understand how parents value schools

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Qualitative:

- Interviews with parents
- Surveys

Quantitative:

- Surveys
- Home prices along school and district boundaries
- Ranked choices from district central assignment mechanism
- Other: School donations, tuition rates

Advantages of school reviews

- Available on a larger scale than individual interviews
- Provide more contextual information than purely quantitative measures
- Available for private and charter schools as well as district schools

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GreatSchools website: Overview

- Large school information aggregator since 1998
 - Profiles of more than 270,000 schools (public, private, and charter)
 - Reports more than 55 million unique visitors per year
- Uses data from NCES, state departments of education, and schools to develop school ratings
 - Ratings posted on real estate websites like Zillow and Redfin
- Users can post school reviews and star ratings
 - More than 1 million user ratings and reviews; however, many schools do not have any reviews

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GreatSchools website: Find schools

Public & private schools ▾

PreK Elementary Middle High

6 **Ps 187 Hudson Cliffs**
349 Cabrini Boulevard, New York, NY, 10040
Public district, K-8 | 806 students
Average 1
Homes for sale

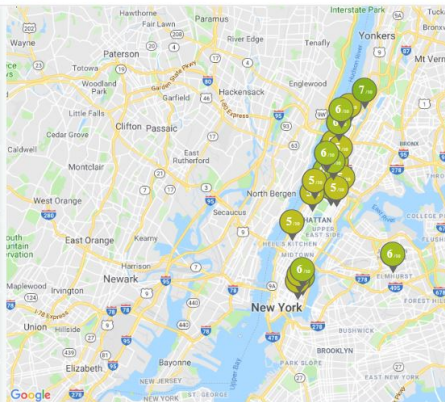
6 **Ps 192 Jacob H Schiff**
500 West 138th Street, New York, NY, 10031
Public district, PK-5 | 309 students
Average 1
Homes for sale

6 **Ps 92 Mary Mcleod Bethune**
222 West 134th Street, New York, NY, 10030
Public district, PK-5 | 296 students
Average 1
Homes for sale

6 **The Children's Workshop School**
610 East 12th Street, New York, NY, 10009
Public charter, PK-5 | 263 students
Average 1
Homes for sale

6 **Harlem Hebrew Language Academy**
147 Saint Nicholas Avenue, New York, NY, 10026
Public charter, K-5 | 388 students
Average 1
Homes for sale

6 **E Harlem Scholars Acad Charter School**
1573 Madison Avenue, New York, NY, 10029
Public charter, K-4 | 325 students
Average 1
Homes for sale



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GreatSchools website: School reviews

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TOPICAL REVIEWS

Bullying policy (1) Character (0) Homework (0) Leadership (0)
Learning Differences Support (1) Teachers (2)

REVIEW THIS SCHOOL

How would you rate your experience at this school?

You

★ ★ ★ ★ ★

Terrible Bad Average Good Great

REVIEW THIS SCHOOL

How would you rate your experience at this school?

You

★ ★ ★ ★ ★

Terrible Bad Average Good Great

RECENT COMMENTS

- Overall experience** ★★★★★
Parent
My daughter goes to this school. The teachers at this school is not concerned about the children's education. The school is more involved in fundraisers and getting money for after school programs. This... More
Submitted by a parent March 03, 2016
[Report Review](#)
- Overall experience** ★★★★★
Parent
My daughter attends Prok this year so while we don't have many years experience we have been very satisfied with her education thus far. All the teachers we have had interactions with have been great.... More
Submitted by a parent May 31, 2015
[Report Review](#)
- Overall experience** ★★★★★
Parent
My daughter started CWS in pre-k and is now in 4th. We love CWS! At the heart of the school is the ethos of peace and social justice and our wise and dedicated teachers and staff. We have an active PTA... More
Submitted by a parent October 21, 2014
[Report Review](#)

RECENT COMMENTS

- Overall experience** ★★★★★
Community member
Academically, the school is great! But it can be stressful for struggling kids and you can touch that sense of discrimination against the kids who are not really advanced. There will be always a complaint... More
Submitted by a community member March 25, 2016
[Report Review](#)
- Overall experience** ★★★★★
Parent
Academically the school does great. Their curriculum matches up to the on site gift program. The children are engaged in alot of programs and there always on field study! What I don't like is the lack... More
Submitted by a parent April 11, 2014
[Report Review](#)
- Overall experience** ★★★★★
Parent
My daughter love it there, she comes home very tired but that's because of all the classes they have and she loves them all!! Like the communications I get every day on how my child behaved and worked... More
Submitted by a parent September 06, 2013
[Report Review](#)
- Overall experience** ★★★★★
Parent
My child is attending this school and now I fully believe I picked the right school for him, at first it was hard since I work full time but little by little it all fell in place...

Data collection

- Collected reviews for elementary schools in New York, NY using GreatSchools API
- School choice is widely utilized NYC school choice
 - 40 percent of NYC kindergartners did not attend their assigned school in 2016-17 (Mader et al. 2018)
- Cleaned spelling, removed unusable reviews, identified common key phrases
- Dataset has 3,646 reviews from 316 schools, 2006-2018

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Summary statistics by school type

	Charter	Private	Public
Number of schools	33	147	136
Percent of schools	10%	47%	43%
Number of reviews per school (mean)	14	10	12
Number of reviews per school (median)	7	6	8
Reviewer star rating out of 5 (mean)	3.8	4.0	4.1
Reviewer star rating out of 5 (median)	4	4	4

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Structural topic modeling (STM)

Similar to other topic models (LDA, CTM) and allows incorporation of metadata

- Corpus is a set of documents
- Each document is a “bag of words”
- For each document d , estimate mixture of topics θ_d
 - Distribution of θ_d can depend on document metadata
- Each topic represents a distribution over words

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Topic 1 Top Words: **Positive environment**

Highest Prob: teacher, love, great, son, staff, daughter, princip, student, care

FREX: staff, thank, amber, love, care, son, forward, safe, daughter

Lift: unorgan, amber, downfal, pleasur, coomb, gateway, fundora, greet, pantelidi

Score: unorgan, love, great, staff, amber, daughter, son, teacher, care

Topic 2 Top Words: **Parent involvement**

Highest Prob: parent, involv, teacher, princip, communic, children, great, pta, communiti

FREX: involv, communic, email, event, parent, coordin, particip, volunt, pta

Lift: journey, bake, grandpar, committe, sale, hamilton, newslett, print, newli

Score: journey, parent, involv, pta, communic, event, coordin, email, princip

Topic 3 Top Words: **Teaching/learning**

Highest Prob: educ, learn, children, student, child, teach, skill, level, world

FREX: world, valu, skill, calhoun, scholar, academi, studio, margaret, trevor

Lift: stuck, owe, featur, trevor, portfolio, boundari, infus, belief, tns

Score: stuck, creativ, educ, valu, world, skill, calhoun, learn, studio

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Topic 4 Top Words: **Positive review, informal**

Highest Prob: kid, teacher, like, good, learn, lot, get, realli, class

FREX: kid, lot, homework, nice, think, dont, like, littl, got

Lift: cool, happili, cooker, singer, stuff, flag, reduc, chaotic, divid

Score: kid, cool, lot, dont, homework, like, good, realli, think

Topic 5 Top Words: **Academic quality**

Highest Prob: excel, academ, teacher, experi, high, small, student, strong, famili

FREX: excel, size, small, french, overal, facil, strong, high, high-school

Lift: thoma, kennedi, lyceum, ardsley, choir, marymount, oll, campus, expans

Score: thoma, excel, academ, strong, experi, small, french, high, high-school

Topic 6 Top Words: **Extracurriculars and special programs**

Highest Prob: program, art, music, class, gift, talent, teacher, activ, scienc

FREX: talent, gift, danc, art, music, tag, program, enrich, chess

Lift: extraordinari, general-educ, citywid, piano, affluent, rosi, chess, sawu, talent

Score: extraordinari, program, gift, art, music, talent, scienc, tag, danc

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Topic 7 Top Words: **Prestige**

Highest Prob: best, year, public, one, daughter, girl, new, citi, grade
FREX: girl, prep, best, citi, harlem, accept, york, decis, private-school
Lift: nestm, british, articl, queen, arab, collegi, godsend, midtown, hsa
Score: nestm, best, girl, citi, prep, public, york, chines, immers

Topic 8 Top Words: **School climate/administration (negative)**

Highest Prob: child, teacher, year, student, parent, children, princip, one, will
FREX: horribl, bulli, poor, sad, disappoint, bad, worst, fail, terribl
Lift: prison, discrimin, anger, contract, copi, danger, whatsoev, clueless, horrend
Score: prison, horribl, bad, child, dont, worst, poor, bulli, disappoint

Topic 9 Top Words: **Community and student support**

Highest Prob: children, communiti, learn, support, child, academ, famili, environ, teacher
FREX: emot, mms, grow, lang, perfect, corlear, confid, social, excit
Lift: asset, mms, corlear, acquir, strike, grace, freedom, serv, cohes
Score: asset, mms, corlear, communiti, lang, emot, social, develop, children

Background

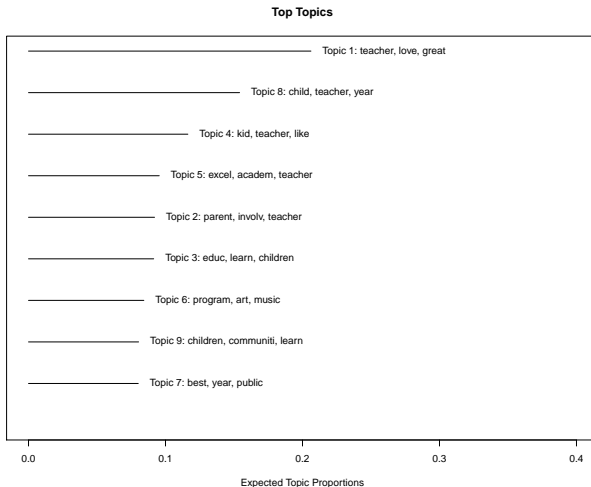
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Topic proportions

Expected topic frequencies in the corpus



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Topic comparisons

Parent involvement vs. Academic quality

parent

activ
work mani
year
great
small
children
class
communiti
wonder
high
student
academ
involv
princip
famili
teacher
strong

excel

Topic 2

Topic 5

Background

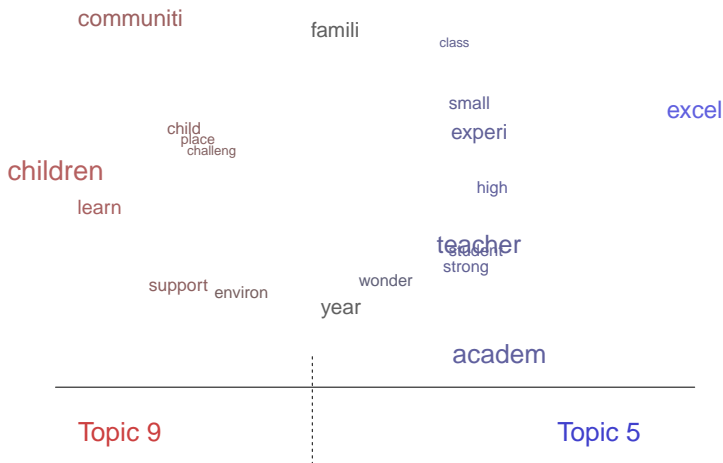
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Topic comparisons

Community and student support vs. Academic quality



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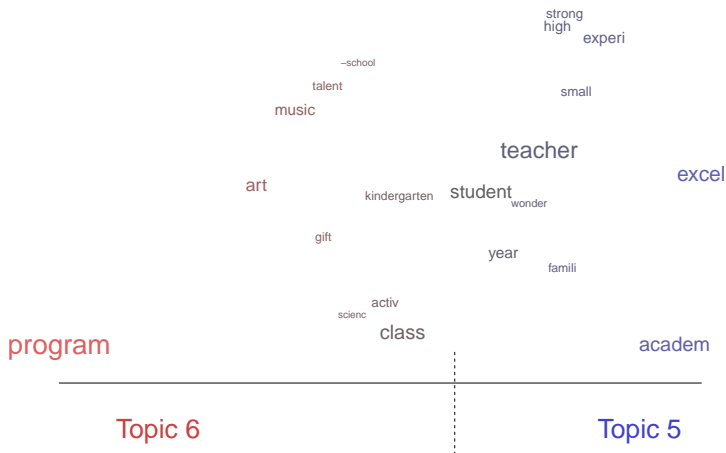
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Topic comparisons

Special programs vs. Academic quality



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Topic differences by school type

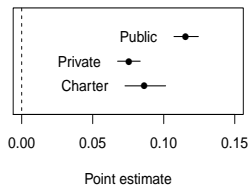
Background

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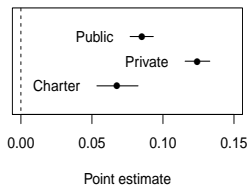
Findings

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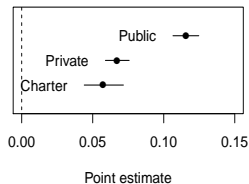
Parent involvement



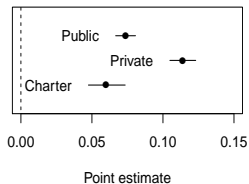
Academic quality



Extracurriculars and special programs



Community and student support



Questions and next steps

- Add school enrollment by race/ethnicity
- Include covariates in STM estimation
 - Which covariates are appropriate to include, if any?
- Do separate analysis for high schools
 - Choice generally higher for high schools, and review topics may be different
- Add reviews from other districts
 - Look at district with greater charter penetration
- Develop more detailed classification of schools
 - Identify magnet schools, bilingual schools, religious vs. secular private schools, etc.
- Classify sentiment (positive/negative reviews)

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Thank you!

NYC elementary school choice

Appendix

Multiple districts, but centralized kindergarten enrollment

- Most districts have elementary school zones

Order of priority for kindergarten applications:

Highest	Children who are zoned for the school
	Children with a sibling at the school
	Children enrolled in school's pre-K program
	Children who live in the district but not the school zone
Lowest	Children who live outside the district

Families do not need to reapply between kindergarten and first grade

Data collection