Social Interactions and Preferences for Schools: Experimental Evidence from Los Angeles

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Motivation

- Parents' choices govern the success of school choice initiatives
  - → In a variety of settings, without additional information, consumers tend not to always respond to quality variation
    (Abaluck et al. 2021; Ainsworth et al. 2023)
  - → In education markets, it's not obvious that parents should only care about school effectiveness
    (MacLeod and Urquiola 2019, Beurmann et al. 2023;)
  - → Evidence is mixed about parents' valuation of school effectiveness
    (Rothstein 2006; Abdulkadiroğlu et al. 2020, Beurmann et al. 2023; Campos and Kearns 2022)

Motivation

- Parents' choices govern the success of school choice initiatives
- Imperfect information makes it challenging to infer preferences from observed choices
  - → A large body of evidence suggests information disparities loom large
    (Hastings and Weinstein 2008; Andrabi et al. 2017; Corcoran et al. 2018; Ainsworth et al. 2022)
  - → Imperfect information introduces identification challenges
    (Abaluck, Compiani, and Zhang 2022)
  - → **Open Question:** What do parents value?

Motivation

- Parents' choices govern the success of school choice initiatives
- Imperfect information makes it challenging to infer preferences from observed choices
- We know very little about what parents actually know
  - → Are they aware of school and peer quality?
  - → Are their beliefs biased?
  - → **Open Question:** What do parents know?

Motivation

- Parents' choices govern the success of school choice initiatives
- Imperfect information makes it challenging to infer preferences from observed choices
- We know very little about what parents actually know
- We know even less about factors mediating choices and their implications
  - → Social interactions are important for learning, engagement with information, and subsequent choices (Conley and Udry 2010; Cai, De Janvry, and Sadoulet 2015; Banerjee et al. 2021)
  - → Social interactions and networks potentially mediate enrollment-based school quality gaps (Hahm and Park 2023)
  - → **Newer Question:** How important are social interactions in the school choice process?

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- Imperfect information makes it challenging to infer preferences from observed choices
- We know very little about what parents actually know
- We know even less about factors mediating choices and their implications
- **This paper:** Jointly study how information, preferences, and social interactions shape choices in education markets and provide evidence on these open questions

This paper

- I organize the questions and objectives around four themes
  1. **What parents know:** What are parents' beliefs about school and peer quality?
  2. **What parents value:** What do parents value when informed about *both* peer and school quality?
  3. **Factors mediating choices:** Do social interactions matter in the school choice process?
  4. **Peaking into the black box of information campaigns:** How do information interventions work? Can we differentiate between a salience and information channel?

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- Setting: Los Angeles
  - → 106 middle schools feed into Zones of Choice (ZOC) markets
  - → ∼22,000 students part of the experimental sample
  - → Two experimental waves, 2019 and 2021

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  4. **Peaking into the black box of information campaigns:** How do information interventions work? Can we differentiate between a salience and information channel?
- Setting: Los Angeles
- Design: Information provision experiment with a few additional features

  → Elicit beliefs about peer and school quality at baseline

  → Distribute information about peer quality and school quality

  → Spillover design allows us to infer the empirical relevance of social interactions

Preview of Results

What parents know

1. Parents tend to underestimate school quality and overestimate peer quality
2. Substantial variation in school and peer quality bias

What parents value and peaking into the black box

3. Parents systematically shift their choices toward more effective (higher VA) schools
4. Decomposition: Salience impacts account for most of the changes in choices

Evidence of Social Interactions

5. Indirectly treated families react in the same way as treated parents (evidence of social interactions shaping demand)
6. Treatment effects (direct and spillover) depend on a critical mass of parents receiving information

Related Literature

1. **Parents' Preferences**
   Rothstein 2006; Cullen et al. 2006; Harris 2015; Burgess et al. 2015; Abdulkadiroglu et al. 2020; Ainsworth et al. 2022; Beuermann et al. 2023
   Contribution: Use information provision to isolate *changes* in preferences

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2. **Information in education markets and the role of salience**
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   Contributions:
   - → Collect information about beliefs and randomize *two* measures of quality
   - → Decompose treatment effects into salience and information updating channels

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   Contributions:
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3. **Social interactions**
   Banerjee 1992; Sasaki and Toda 1996; Bertrand et al. 2000; Manski 2000; Brock and Durlauf 2002; Durlauf 2004; Jackson 2008; Allende 2019; Billings et al. 2019; Breza and Chandrasekhar 2019; Banerjee et al. 2021; Cox et al. 2021; Leshno 2021
   Contribution: Empirical relevance of externality occurring at the preference formation stage

Roadmap

1. Setting and Experiment Design
2. Reduced Form Evidence
3. Survey Evidence: AG and IA Bias
4. Impacts on Utility Weights
   - → School choice model with and without information frictions
   - → Decomposition of utility weight impacts
5. Implications and Discussion

Setting and Design

Setting: Zones of Choice

- ZOC is a neighborhood-based public school choice program
- Sixteen mutually exclusive high school markets within Los Angeles
  - → Parents' choice sets are fixed and specific to their neighborhood
  - → Segregated in terms of race/ethnicity and SES
- I intervene in middle schools that feed into different markets
  - → Students enrolled in a feeder middle school apply to a particular ZOC market
  - → Useful stage to intervene with information before parents submit applications
- Applications contain a rank-ordered list and assignments are centralized

▸ ZOC Map ▸ ZOC Descriptives

Timeline

1. Baseline Survey: Early September
   - → Distributed in the classroom and via text message
   - → Include a video that teaches parents about the differences between school and peer quality
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   - → Treatment-specific videos that help parents understand the information

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   - → Treatment-specific videos that help parents understand the information
3. Applications submitted: October-November

Baseline Survey

Survey Goals:

- Collect information on parents' school and peer quality beliefs
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Challenges:

1. How do you define school and peer quality?

   Researcher definition of school and peer quality:

   → School quality is estimated school value-added

   → Peer quality is analogous to school average test scores

   → School quality validated using lotteries (Angrist et al. 2017)

   Definition for parents:

   → School quality is referred to as Achievement Growth (AG)

   → Peer quality is referred to as Incoming Achievement (IA)

Baseline Survey

Survey Goals:

- Collect information on parents' school and peer quality beliefs
- Collect a pre-intervention rank-ordered list

Challenges:

1. How do you define school and peer quality?
2. Many degrees of freedom in eliciting beliefs

   → Ask parents to assess where schools in their choice set rank across all other schools in the district

   → For example: For AG (or IA), is School A in the Top 10%, 80-90%, ...?

   → I collect beliefs about the decile parents think their schools belong to

Baseline Survey

Survey Goals:

- Collect information on parents' school and peer quality beliefs
- Collect a pre-intervention rank-ordered list

Challenges:

1. How do you define school and peer quality?
2. Many degrees of freedom in eliciting beliefs
3. Explaining the difference between test score value-added and test score levels is challenging. What I do:

   → Survey includes a video that helps explain the differences between school and peer quality

   → Use visual aids to explain the differences

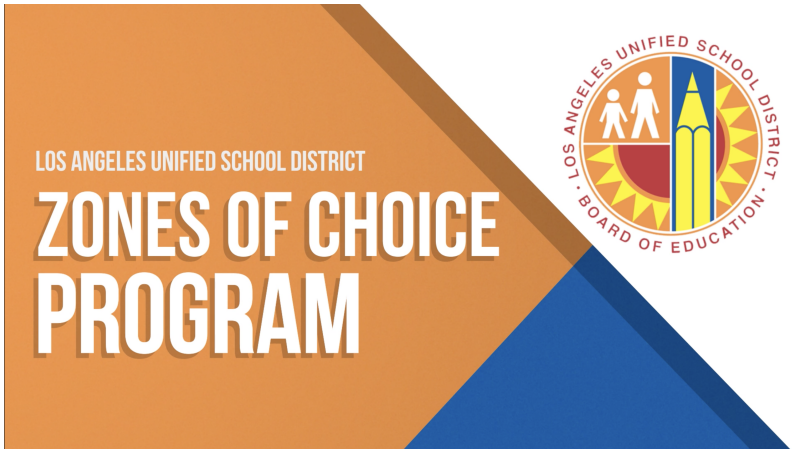
Video

Watch Video

English

Spanish

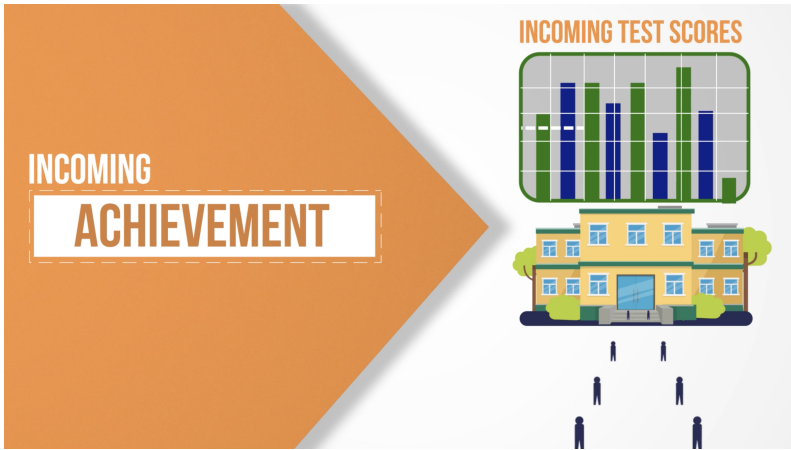
Signal the information is on behalf of the school district



Introduce the two concepts



Use visual aid to describe IA



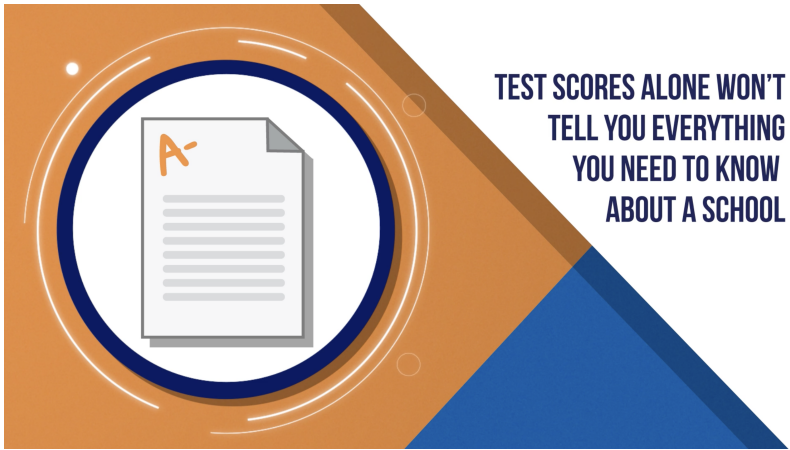
Use visual aid to describe AG



Describe some differences but remain agnostic about which is better



Remind parents that test scores are not all they should consider



Experiment Design

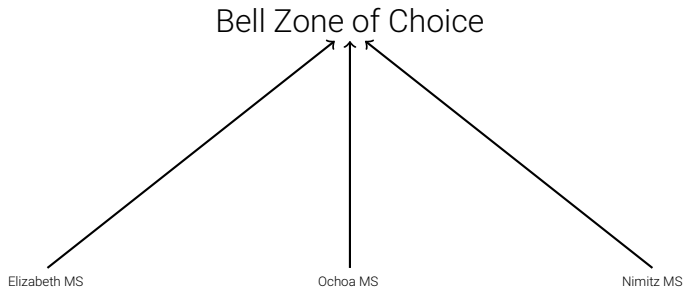
Goals:

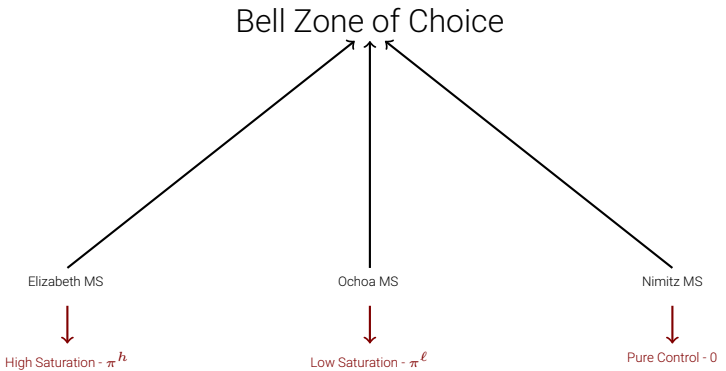
1. Identify parents' valuations of peer and school quality

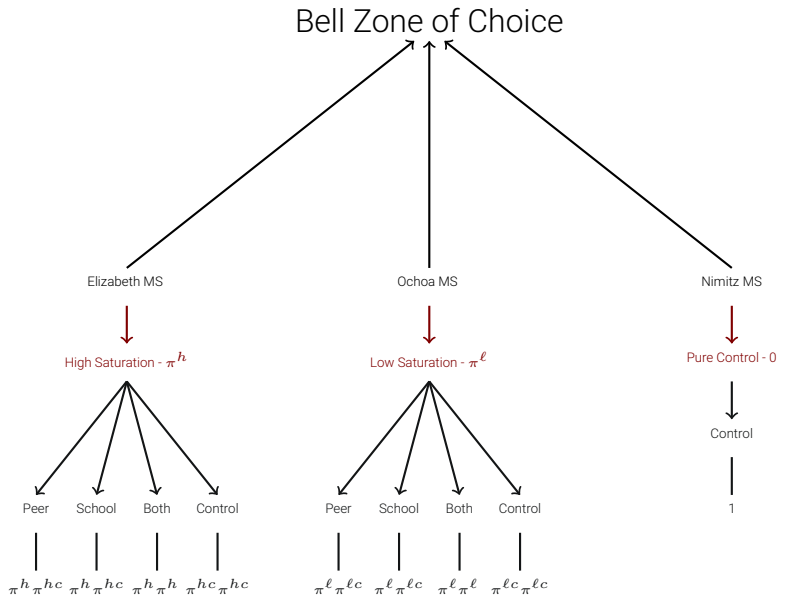
   → Cross-randomize peer and school quality

2. Identify social interactions

   → Two-stage randomization (Crepon et al. 2013)


Bell Zone of Choice
Elizabeth MS
Ochoa MS
Nimitz MS


Bell Zone of Choice
Elizabeth MS
Ochoa MS
Nimitz MS
High Saturation - π^h
Low Saturation - π^ℓ
Pure Control - 0

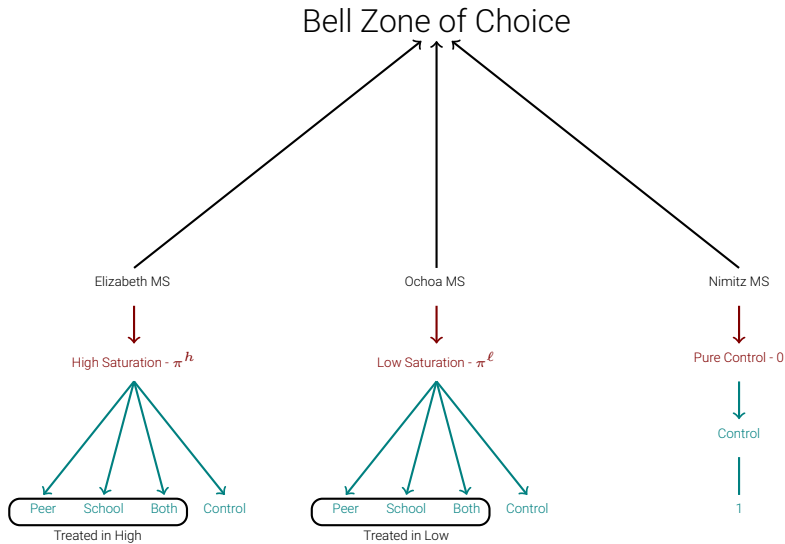

Bell Zone of Choice
Elizabeth MS
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High Saturation - π^h
Low Saturation - π^ℓ
Pure Control - 0
Control
1
Peer
School
Both
Control
Peer
School
Both
Control
$\pi^h \pi^{hc}$
$\pi^h \pi^{hc}$
$\pi^h \pi^h$
$\pi^{hc} \pi^{hc}$
$\pi^\ell \pi^{\ell c}$
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$\pi^\ell \pi^\ell$
$\pi^{\ell c} \pi^{\ell c}$

Data

- LAUSD administrative student data 2015-2021
  - → Demographics
  - → Test scores
  - → Addresses
- Zones of Choice data 2015-2021
  - → Applications containing rank-ordered lists
  - → Centralized assignments
- Survey data
  - → Baseline beliefs
  - → Baseline rank-ordered list

▸ Descriptive Statistics ▸ School-level Balance ▸ Student-level Balance ▸ Survey Respondents

Reduced Form Evidence

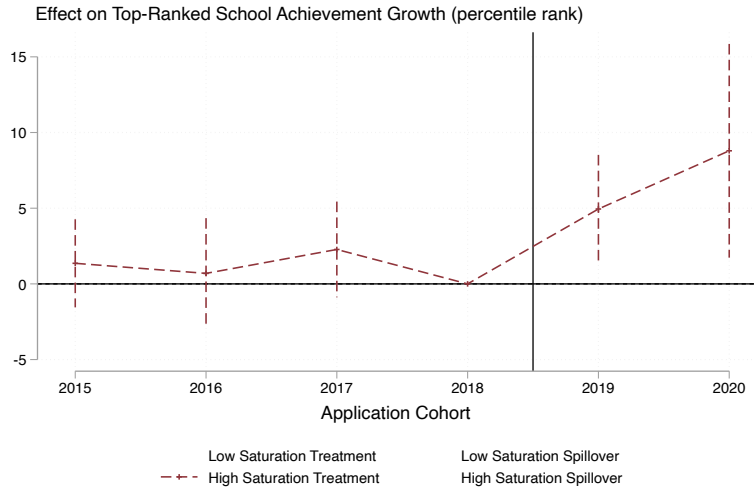

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High Saturation - π^h
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Peer
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Treated in High
Peer
School
Both
Control
Treated in Low
Control
1

Difference-in-differences

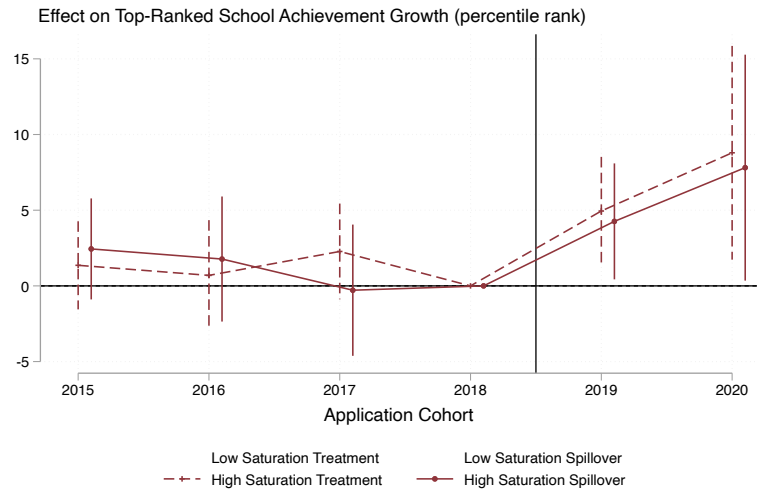
$$Y_i = \alpha_{z(i)t(i)} + \alpha_{g(i)} + \sum_{k \neq -1} \Bigg(\underbrace{\beta_{Lk} D_{L(i)} \times Post_{k(i)} + \beta_{Hk} D_{H(i)} \times Post_{k(i)}}_{High\ and\ Low\ Treatment\ Groups} + \underbrace{\psi_{Lk} C_{L(i)} \times Post_{k(i)} + \psi_{Lk} C_{H(i)} \times Post_{k(i)}}_{High\ and\ Low\ Spillover\ Groups} \Bigg) + u_i$$

- Y_i: parent i's top-ranked school attributes (achievement growth and incoming achievement)
- $D_{L(i)}$, $D_{H(i)}$: treatment indicators for parents in low- and high-saturation schools
- $C_{L(i)}$, $C_{H(i)}$: spillover indicators for parents in low- and high-saturation schools
- $Post_{k(i)}$: indicator for treated cohorts
- β_{Hk}, β_{Lk}, ψ_{Hk}, and ψ_{Lk} are treatment-group-specific difference-in-difference estimates

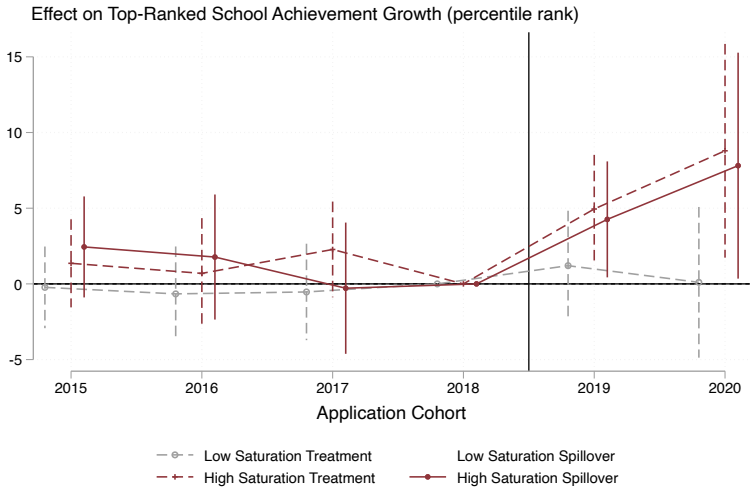
Increased demand for AG among treated in high saturation schools



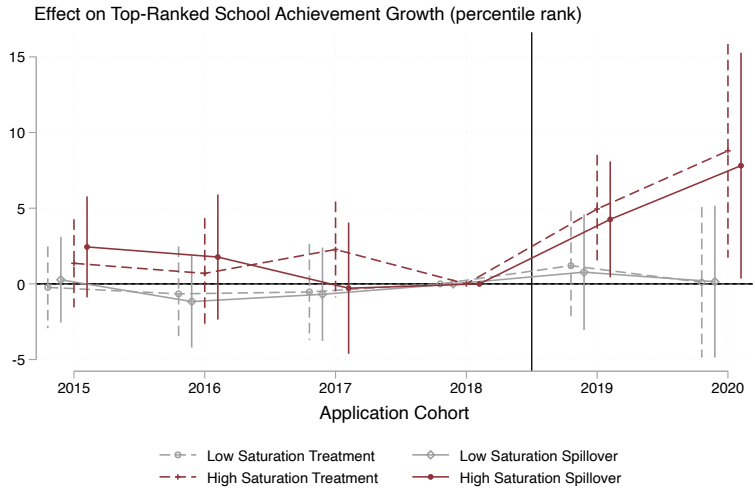
Similar effects among indirectly treated in high saturation schools



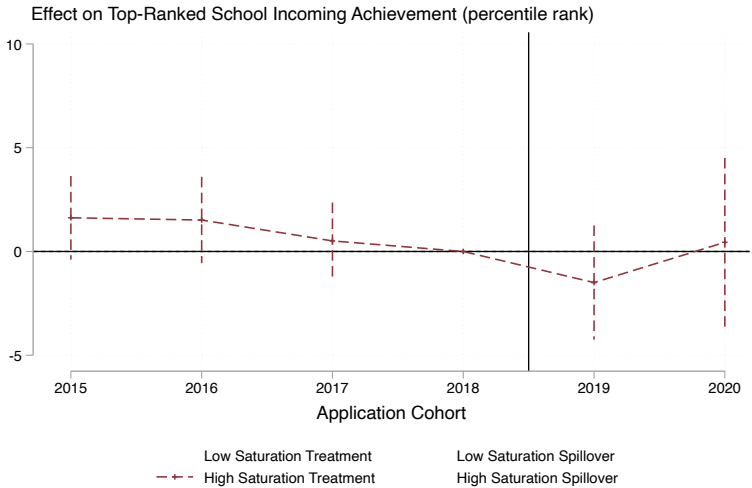
No effect on demand for AG among treated in low saturation schools



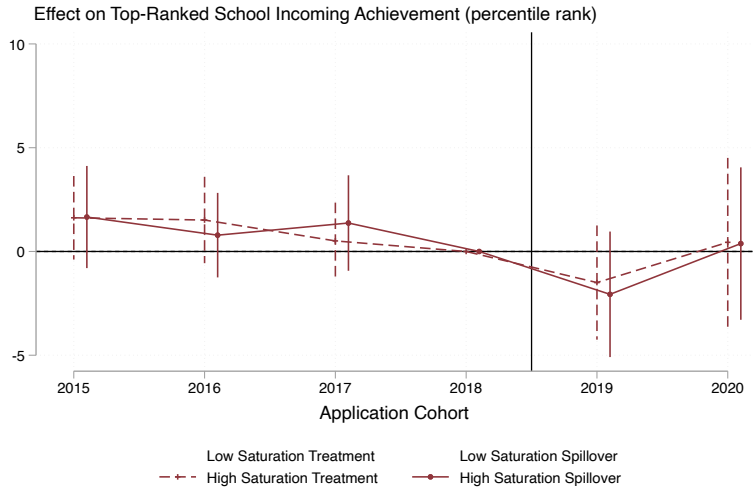
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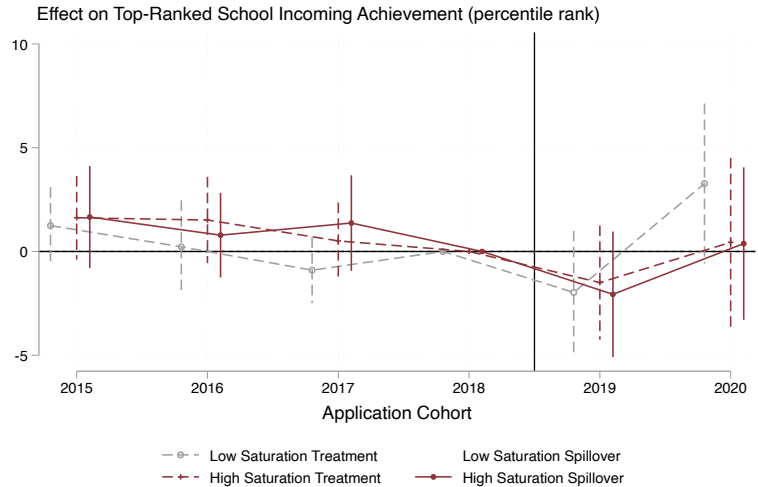
No detectable impacts on demand for IA for all treatment groups



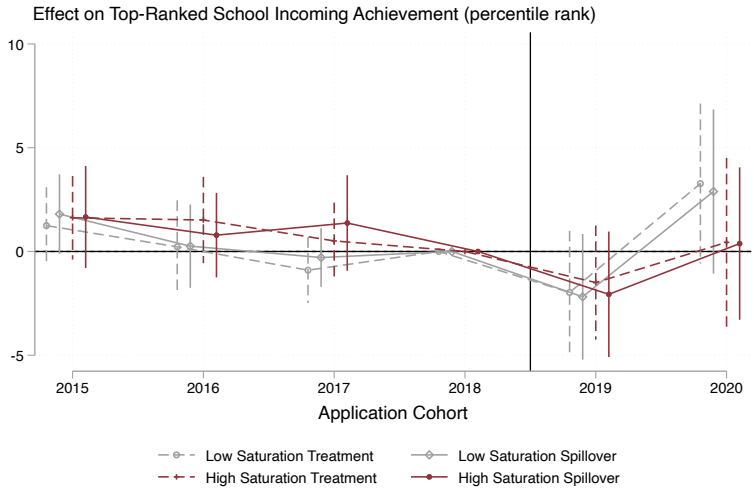
No detectable impacts on demand for IA across all treatment groups



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Distributional Impacts

$$\mathbf{1}\{Y_i \leq a\} = \alpha_{zb} + \beta_P T_i^P + \beta_S T_i^S + \beta_B T_i^B + \beta_{Spill} C_i + u_i$$

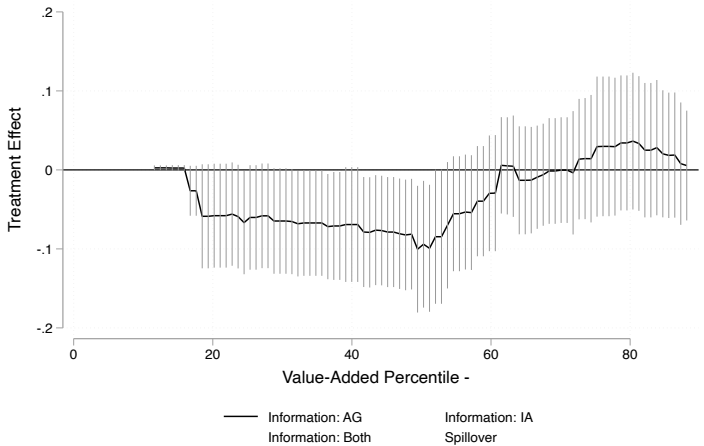
- $1\{Y_i \leq a\}$ as an outcome recovers effects on the CDF of Y at different points of support $a \in [\underline{a}, \bar{a}]$
- Report estimates from 100 separate regressions at different points of support

Distributional Impacts

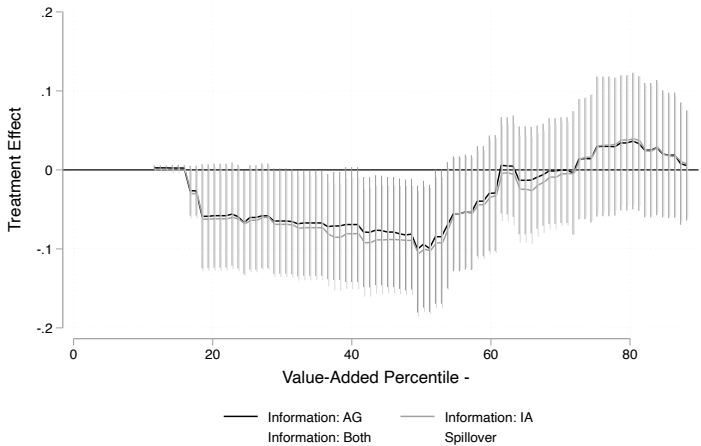
$$\mathbf{1}\{Y_i \leq a\} = \alpha_{zb} + \beta_P T_i^P + \beta_S T_i^S + \beta_B T_i^B + \beta_{Spill} C_i + u_i$$

- $1\{Y_i \leq a\}$ as an outcome recovers effects on the CDF of Y at different points of support $a \in [\underline{a}, \bar{a}]$
- Report estimates from 100 separate regressions at different points of support
- Consider treatment-specific effects, ignoring saturation groups: $\beta_P, \beta_S, \beta_B, \beta_{Spill}$
- Distributional estimates demonstrate that demand moved uniformly across the distribution, regardless of individual treatment status

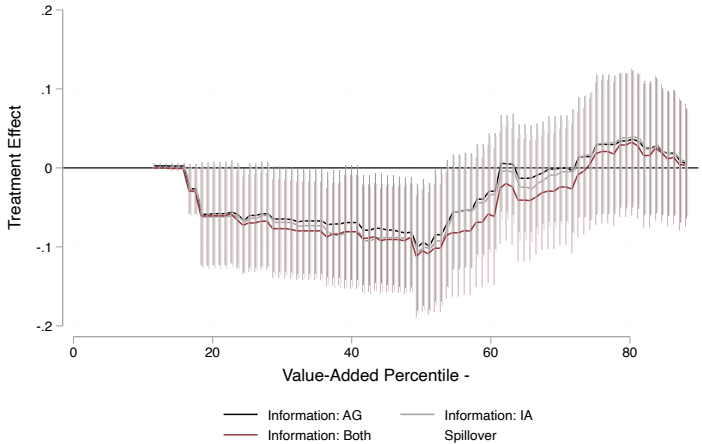
Distributional effects show increased demand for higher AG schools



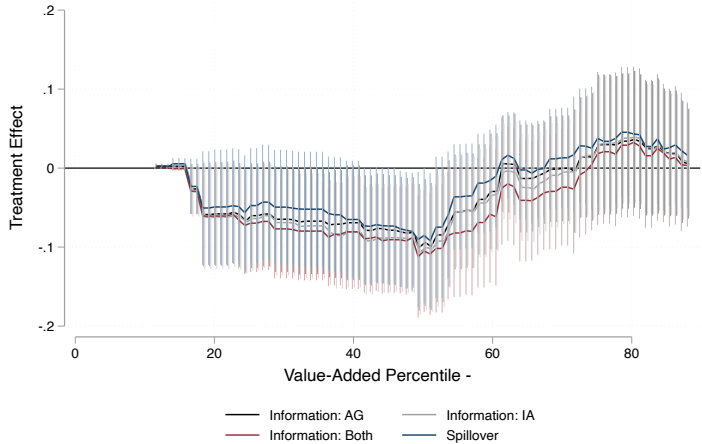
Distributional Effects Show an Increased demand for higher AG schools



Distributional Effects Show an Increased demand for higher AG schools



Spillover effects identical to treatment effects across the distribution



▸ IA and AG Support ▸ Results at other ROL ranks ▸ Impacts on Other Attributes ▸ Other Specifications

Survey Evidence

Survey Evidence

- Survey evidence for the 2021 cohort
- Response rate is roughly 50 percent

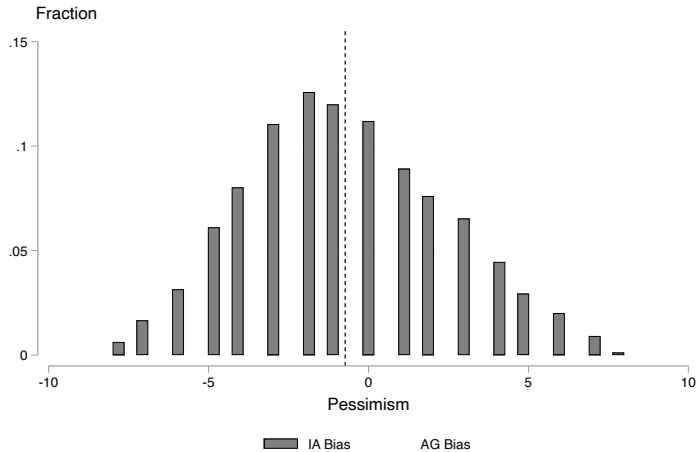
Today:

- Descriptive survey evidence for today
- Bias defined terms of pessimism (in decile units)
- Parent $i's$ bias for attribute x at school j is:

$$b_{ji}^{x} \equiv Q_{j}^{x} - \tilde{Q}_{ji}^{x} \quad x \in \{IA, AG\}$$

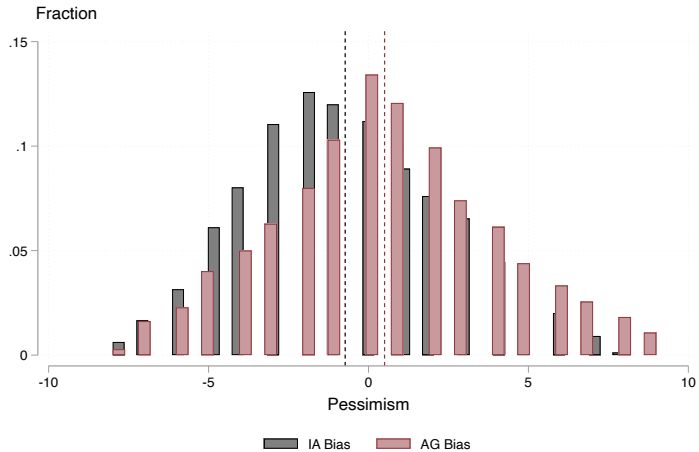
with Q_j^x referring to researcher-generated quality and $\tilde{Q}_{ji}^x$ referring to beliefs

IA and AG Bias Distribution



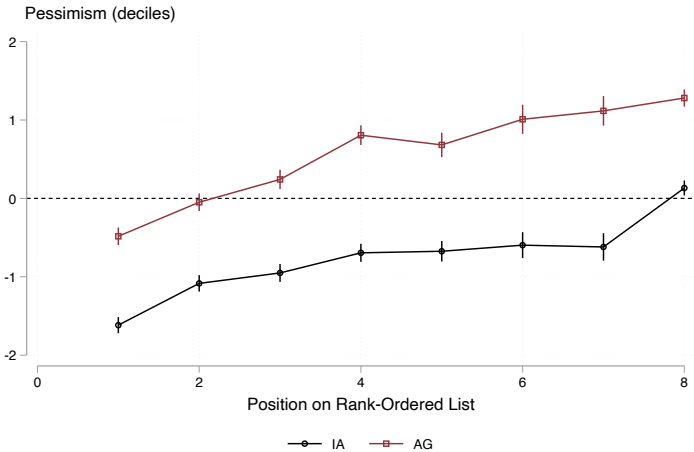
- Parents tend to overestimate IA by roughly 0.7 deciles
- IA overestimated by roughly 14 percent on average (SD=0.46)

IA and AG Bias Distribution



- Parents tend to overestimate IA by roughly 0.7 deciles
- IA overestimated by roughly 14 percent on average (SD=0.46)
- Parents tend to underestimate AG by roughly 0.5 deciles
- AG underestimated by roughly 2 percent on average (SD=0.34)

Bias by Position of the Rank-Ordered List



- Parents overestimate most-preferred AG and IA by 32 and 13 percent, respectively
- Parents more optimistic about AG than IA across the entire list
- Modest gradient indicating parents are more pessimistic about options they prefer less

Discrete Choice Results

The Effects of an Information Campaign

Student i's indirect utility of being assigned school j is

$$U_{ij} = \gamma_P Q_j^P + \gamma_S Q_j^S - \lambda d_{ij} + \varepsilon_{ij}$$

- Q_j^P, Q_j^S: peer and school quality, respectively
- d_{ij}: distant to school j for parent i
- ε_{ij} : unobserved preference heterogeneity

The Effects of an Information Campaign

The information campaign's effects are summarized by changes in utility weights

$$U_{ij} = -\lambda d_{ij} + \underbrace{\gamma_P Q_j^P + \gamma_S Q_j^S}_{Control} + \sum_{t \in \{P,S,B,Sp\}} \beta_{Pt} Q_j^P \times \mathbf{1}\{i \in \mathcal{I}_t\} + \beta_{St} Q_j^S \times \mathbf{1}\{i \in \mathcal{I}_t\} + \varepsilon_{ij}$$

- $\mathbf{1}\{i \in \mathcal{I}_t\}$ correspond to treatment $t \in \{Peer, School, Both, Spillover\}$ indicators

The Effects of an Information Campaign

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$$U_{ij} = -\lambda d_{ij} + \underbrace{\gamma_P Q_j^P + \gamma_S Q_j^S}_{Control} + \sum_{t \in \{P,S,B,Sp\}} \beta_{Pt} Q_j^P \times \mathbf{1}\{i \in \mathcal{I}_t\} + \beta_{St} Q_j^S \times \mathbf{1}\{i \in \mathcal{I}_t\} + \varepsilon_{ij}$$

- $\mathbf{1}\{i \in \mathcal{I}_t\}$ correspond to treatment $t \in \{Peer, School, Both, Spillover\}$ indicators
- $\frac{\beta_{SS}}{\lambda}$, $\frac{\beta_{PP}}{\lambda}$, $\frac{\beta_{SB}}{\lambda}$, $\frac{\beta_{PB}}{\lambda}$ summarize effects on willingness to travel (WTT) among those getting the attribute-specific information and $\frac{\beta_{SSp}}{\lambda}$, $\frac{\beta_{PSp}}{\lambda}$ summarize effects among those indirectly treated
- $\frac{\beta_{SP}}{\lambda}$, $\frac{\beta_{PS}}{\lambda}$ summarize WTT effects on one attribute induced by information about another

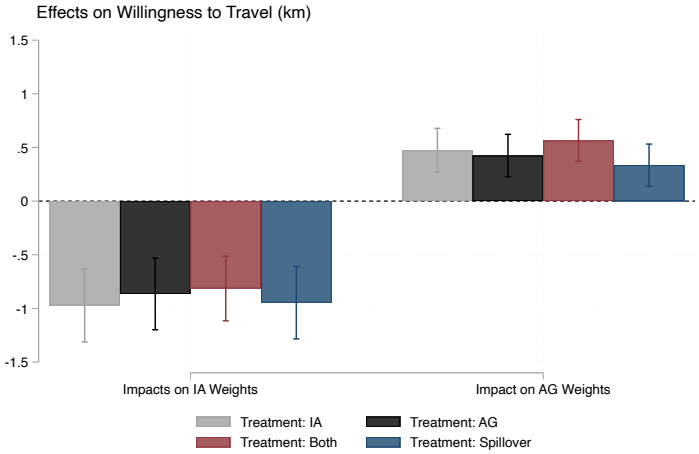
The Effects of an Information Campaign

The information campaign's effects are summarized by changes in utility weights

$$U_{ij} = -\lambda d_{ij} + \underbrace{\gamma_P Q_j^P + \gamma_S Q_j^S}_{Control} + \sum_{t \in \{P,S,B,Sp\}} \beta_{Pt} Q_j^P \times \mathbf{1}\{i \in \mathcal{I}_t\} + \beta_{St} Q_j^S \times \mathbf{1}\{i \in \mathcal{I}_t\} + \varepsilon_{ij}$$

- $\mathbf{1}\{i \in \mathcal{I}_t\}$ correspond to treatment $t \in \{Peer, School, Both, Spillover\}$ indicators
- $\frac{\beta_{SS}}{\lambda}$, $\frac{\beta_{PP}}{\lambda}$, $\frac{\beta_{SB}}{\lambda}$, $\frac{\beta_{PB}}{\lambda}$ summarize effects on willingness to travel (WTT) among those getting the attribute-specific information and $\frac{\beta_{SSp}}{\lambda}$, $\frac{\beta_{PSp}}{\lambda}$ summarize effects among those indirectly treated
- $\frac{\beta_{SP}}{\lambda}$, $\frac{\beta_{PS}}{\lambda}$ summarize WTT effects on one attribute induced by information about another
- Assumptions for estimation: logit errors and truthful reporting

Information Campaign Effects



- Decrease in WTT for 10 ppt increase in IA: $\sim$ -1km
- Increase in WTT for 10 ppt increase in AG: $\sim$ 0.5km
- Treatment effects similar regardless of individual treatment status; mirrors reduced form evidence
- Utility weight impacts are a summary measure, nesting both information and salience effects

Combining survey moments with utility weight impacts

The treatment $P(S)$ impact on the utility weight for $Q_j^P(Q_j^S)$ is

$$\tilde{\beta}_{PP} = \Big(\underbrace{\beta_{PP}}_{Salience} - \underbrace{\mu_P \gamma_P}_{Information\ Updating} \Big)$$

$$\tilde{\beta}_{SS} = \Big(\underbrace{\beta_{SS}}_{Salience} - \underbrace{\mu_S \gamma_S}_{Information\ Updating} \Big)$$

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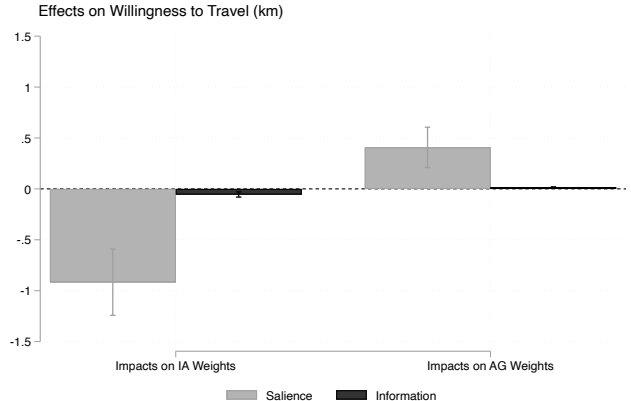
$$\tilde{\beta}_{SS} = \Big(\underbrace{\beta_{SS}}_{Salience} - \underbrace{\mu_S \gamma_S}_{Information\ Updating} \Big)$$

- μ_P, μ_S : mean bias identified in the survey
- γ_P, γ_S : utility weights for the control group
- Salience is a residual and the portion of the change that can't be accounted for by the mean bias before the intervention

▸ Decomposition Details

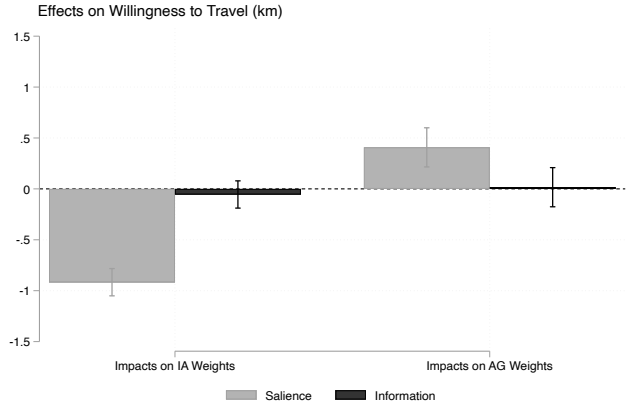
Decomposition Results

Salience accounts for most of the effects



Decomposition Results

Range of estimates for $\hat{\mu}_P \in [\mu_P - \sigma_{Pb}, \mu_P + \sigma_{Pb}]$ *and* $\hat{\mu}_S \in [\mu_S - \sigma_{Sb}, \mu_S + \sigma_{Sb}]$



Discussion

VA-oriented information campaigns

- Parents respond to variation and information about school quality more than they do for peer quality
- VA-oriented campaigns have the potential to affect demand for effective schools, segregation, potentially amplified in equilibrium (Allende et al. 2019)

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Social interactions and their implications

- Evidence of an externality at the preference formation stage
- Information interventions that encourage social interactions (Banerjee et al. 2022) can potentially address network-based disparities in accessing effective schools

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Social interactions and their implications

- Evidence of an externality at the preference formation stage
- Information interventions that encourage social interactions (Banerjee et al. 2022) can potentially address network-based disparities in accessing effective schools

The role of salience

- Information campaigns potentially operate by addressing information disparities but also by re-orienting demand

Agenda Moving Forward

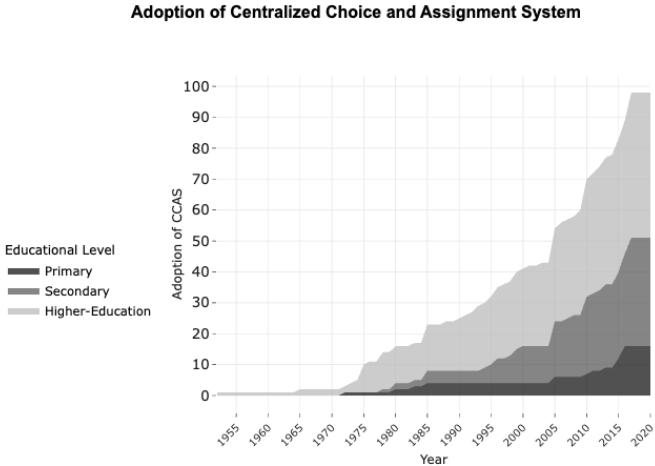
Effects of VA-oriented information campaigns on

- Short-run student outcomes
- School enrollment segregation
- Equilibrium outcomes
- Neighborhood choice

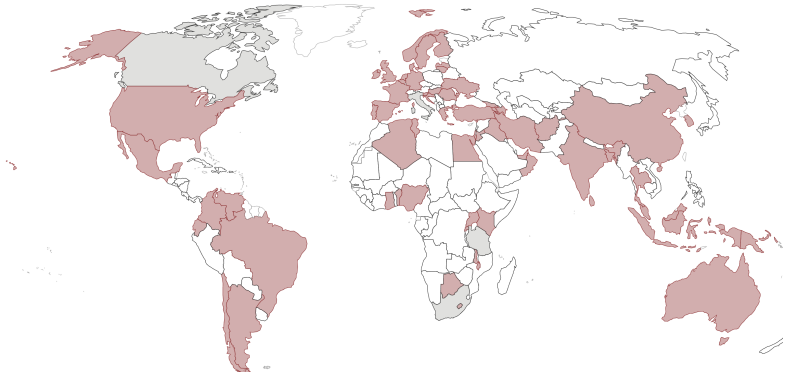
Thank you!

Christopher.Campos@chicagobooth.edu

Motivation: Rise of Centralized Choice in Public Education Systems



Motivation: Rise of Centralized Choice in Public Education Systems



Source: Neilson 2021

Treatment Letters in English and Spanish

We are providing information about schools within your Zone of Choice to ensure you have the best information available prior to your upcoming decision.

Bell Zone of Choice

We determine the quality of a school based on students' average scores on state exams

This measure has two parts you should consider, one which measures the school's ability of attracting high scoring students, and the second is the school's impact on test score growth.

Therefore, a school's observed quality is a combination of both their students' **incoming achievement** and the **achievement growth** they obtain while at the school. Some parents may prefer schools with high incoming achievement, and others may prefer schools with high achievement growth. The table below provides each school's district-wide ranking.

Incoming Achievement

Incoming achievement is the average test scores of school's incoming students at the time they enter school.

Achievement Growth

We measure a school's ability improve test scores by measuring the growth of their students' test scores between entry into the school and eleventh grade.

We hope you use this information when choosing the right school for your student.

School	Incoming Achievement*	Achievement Growth*	Campus Location	Type of School
Science, Technology, Engineering, Arts & Math (STEAM) High School	76	94	Legacy HS	Small School
Visual & Performing Arts (VAPA) High School	74	67	Legacy HS	Small School
Health Academy	58	58	Elizabeth LC	Small Learning Community
Multilingual Teacher Academy	63	50	Bell HS	Linked Learning Academy
STEAM	47	82	Maywood Academy	Small Learning Community
Information Technology Academy	49	53	Elizabeth LC	Small Learning Community
Arts Language & Performance Humanities Academy	63	50	Bell HS	Linked Learning Academy
9thGrade Academy	47	82	Maywood Academy	Small Learning Community
Bell Global Studies	63	50	Bell HS	Small Learning Community

Estamos proporcionando información sobre las escuelas dentro de su Zona de Opción, para asegurarnos de que tenga la mejor información disponible antes de su próxima decisión.

Zona de Opción Bell

Determinamos la calidad de una escuela en función de los puntajes promedio de los estudiantes en los exámenes estatales

Esta medida tiene dos partes que debe considerar, una que mide la capacidad de la escuela para atraer a estudiantes con altas calificaciones, y la segunda es el impacto de la escuela en el crecimiento de las calificaciones de las pruebas.

Por lo tanto, la calidad observada de una escuela es una combinación tanto del **rendimiento entrante** de sus estudiantes como del **crecimiento de logros** o **crecimiento del rendimiento** que obtienen mientras están en la escuela. Algunos padres pueden preferir escuelas con alto rendimiento entrante, y otros pueden preferir escuelas con alto crecimiento de logros. A continuación, proporcionamos la clasificación de cada escuela comparado a todas escuelas en el distrito.

Rendimiento Entrante

El rendimiento entrante de una escuela es el puntaje promedio de sus estudiantes cuando ingresan a la escuela.

Crecimiento de logros

Medimos la capacidad de una escuela para mejorar los puntajes de los exámenes midiendo el crecimiento de los puntajes de los exámenes de sus estudiantes entre el ingreso a la escuela y el onceavo grado.

Esperamos que utilice esta información al elegir la escuela adecuada para su estudiante.

Escuela	Rendimiento Entrante*	Crecimiento de logros*	Ubicación del campus	Tipo de escuela
Preparatoria de Ciencia, Tecnología, Ingeniería, Artes y Matemáticas (STEAM)	76	94	Legacy HS	Escuela Pequeña
Preparatoria de Artes Visuales y Técnicas (VAPA)	74	67	Legacy HS	Escuela Pequeña
Academia de Salud	58	58	Elizabeth LC	Comunidad Educativa Pequeña (SLC)
Academia de Aprendizaje Enlazado/ Carrera de Profesores Multilingües	63	50	Bell HS	Academia de Aprendizaje Enlazado
Academia de Ciencia, Tecnología, Ingeniería, Artes y Matemáticas (STEAM)	47	82	Maywood Academy	Comunidad Educativa Pequeña (SLC)
Academia de Información Tecnológica	49	53	Elizabeth LC	Comunidad Educativa Pequeña (SLC)
Academia de Artes, Idiomas, Artes Escénicas y Humanidades	63	50	Bell HS	Academia de Aprendizaje Enlazado
Academia del 9º Grado	47	82	Maywood Academy	Comunidad Educativa Pequeña (SLC)
Estudios Globales	63	50	Bell HS	Comunidad Educativa Pequeña (SLC)

Descriptive Statistics

	Non-ZOC	ZOC	Difference
	(1)	(2)	(3)
Reading Scores	0.135	-0.117	-0.252
			(0.081)
Math Scores	0.099	-0.114	-0.213
			(0.081)
College	0.1	0.065	-0.036
			(0.017)
Migrant	0.036	0.054	0.018
			(0.007)
Female	0.513	0.481	-0.032
			(0.016)
Poverty	0.909	0.967	0.058
			(0.024)
Special Education	0.148	0.141	-0.007
			(0.022)
English Learners	0.076	0.134	0.058
			(0.017)
Black	0.107	0.03	-0.077
			(0.027)
Hispanic	0.683	0.862	0.179
			(0.075)
White	0.038	0.015	-0.024
			(0.009)
N	26,517	13,015	

Go Back

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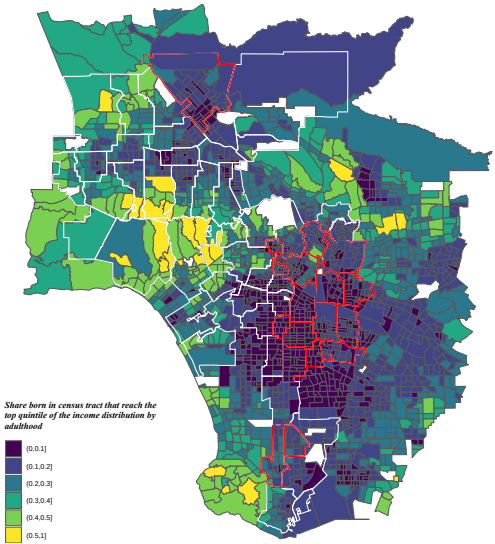
Go Back

School-level Balance

	Control (1)	Low - Control (2)	High - Control (3)
ELA	-.116	.021	.028
		(.102)	(.103)
Math	-.109	-.005	.029
		(.1)	(.116)
College	.081	.006	-.005
		(.022)	(.024)
Migrants	.063	-.009	-.005
		(.008)	(.008)
Female	.486	0	.015
		(.014)	(.01)
Poverty	.947	.011	.005
		(.026)	(.027)
Special Education	.126	.016	.008
		(.011)	(.009)
English Learner	.121	.005	.022
		(.015)	(.02)
Black	.04	-.009	-.011
		(.015)	(.014)
Hispanic	.846	.008	-.014
		(.037)	(.024)
White	.017	0	-.002
		(.007)	(.008)
Size of Cohort	239.639	16.212	18.399
		(44.856)	(42.92)
Number of Schools	20	16	16
Number Treated	0	2633	3780

Go Back

ZOC neighborhoods are mostly classified as low mobility by Chetty et al. (2018)



Student-level Balance (within treated schools)

	Control (1)	Peer - Control (2)	School - Control (3)	Both - Control (4)	P-value (5)
ELA Scores	-.101	.016	-.05	0	.144
		(.039)	(.021)	(.038)	
Math Scores	-.114	.027	-.004	-.025	.794
		(.031)	(.024)	(.037)	
Parents College	.065	.002	-.005	0	.856
		(.011)	(.008)	(.014)	
Migrant	.047	.01	0	.004	.156
		(.007)	(.008)	(.01)	
Female	.477	.001	.003	-.002	.998
		(.017)	(.018)	(.025)	
Poverty	.968	.006	.003	-.01	.263
		(.004)	(.006)	(.006)	
Special Education	.135	.007	.018	-.012	.35
		(.011)	(.01)	(.013)	
English Learners	.128	.007	.009	.001	.5
		(.01)	(.009)	(.013)	
Black	.024	.006	.002	-.007	.646
		(.005)	(.005)	(.007)	
Hispanic	.864	-.012	.007	.003	.121
		(.009)	(.011)	(.014)	
White	.014	.001	.001	-.002	.949
		(.004)	(.004)	(.005)	
Joint Test P-value		.757	.607	.905	
N	1836	1906	1906	2641	

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N	1836	1906	1906	2641	

	(1) No Survey	(2) Partial	(3) Complete
Reading Z-Score	-0.199	0.011	0.151***
		(0.032)	(0.025)
Math Z-Score	-0.187	0.010	0.162***
		(0.044)	(0.022)
Female	0.495	-0.011	-0.018**
		(0.013)	(0.009)
Migrant	0.002	0.002	0.000
		(0.002)	(0.001)
Poverty	0.901	0.004	-0.012
		(0.009)	(0.008)
Special Education	0.144	0.012	-0.008
		(0.010)	(0.008)
English Learner	0.179	0.009	-0.028***
		(0.009)	(0.008)
College	0.081	-0.010	0.023**
		(0.010)	(0.010)
Black	0.032	-0.010***	0.000
		(0.003)	(0.002)
Hispanic	0.911	-0.001	-0.017*
		(0.009)	(0.010)
White	0.016	0.001	0.001
		(0.003)	(0.002)
N	5,154	1,355	4,132

Go Back

School and Peer Quality Definition

$$Y_{ij} = \mu_j + a_i$$

- Y_{ij} is student i's potential achievement at school j
- μ_j is school j mean potential outcome
- a_i is mean-zero student ability

School and Peer Quality Definition

$$Y_{ij} = \mu_j + a_i$$

- Y_{ij} is student i's potential achievement at school j
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- a_i is mean-zero student ability

Estimation and Validation:

$$Y_i = \mu_0 + \sum_j \beta_j D_{ij} + \gamma' X_i + u_i$$

- D_{ij} are school j enrollment indicators; $\beta_j = \mu_j - \mu_0$ is school j average treatment effect
- $a_i = \gamma' X_i + u_i$ with X_i containing baseline covariates and lagged test scores

School and Peer Quality Definition

$$E[Y_i|S_i = j] = \underbrace{\beta_j}_{School\ Quality\ Component} + \underbrace{\theta' \bar{X}_j}_{E[a_i|S_i=j]:\ Peer\ Quality\ Component}$$

School and Peer Quality Definition

$$E[Y_i|S_i = j] = \underbrace{\beta_j}_{School\ Quality\ Component} + \underbrace{\theta' \bar{X}_j}_{E[a_i|S_i=j]:\ Peer\ Quality\ Component}$$

- School Quality is referred to as **Achievement Growth** and is defined as

$$Q_j^S = \text{int}\left(\frac{\text{rank}(\hat{\beta}_j)}{J} \times 100\right)$$

- Peer Quality is referred to as **Incoming Achievement** and is defined as

$$Q_j^P = \text{int}\left(\frac{\text{rank}(\hat{\theta}' \bar{X}_j)}{J} \times 100\right)$$

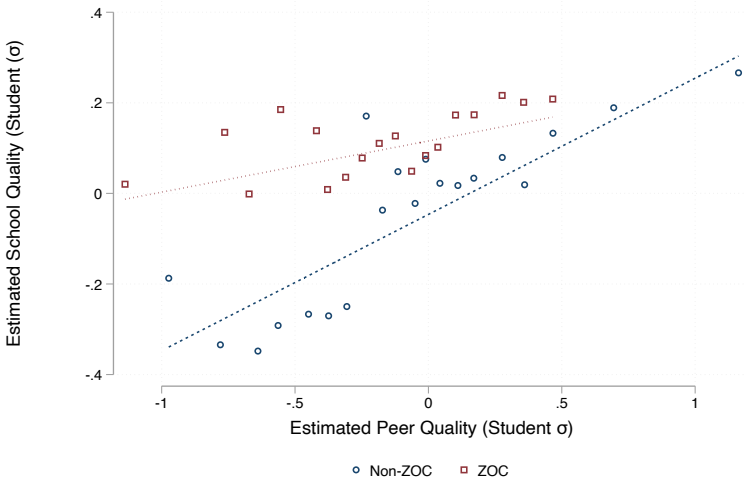
- Peer and school quality are positively correlated Evidence

VAM Validation

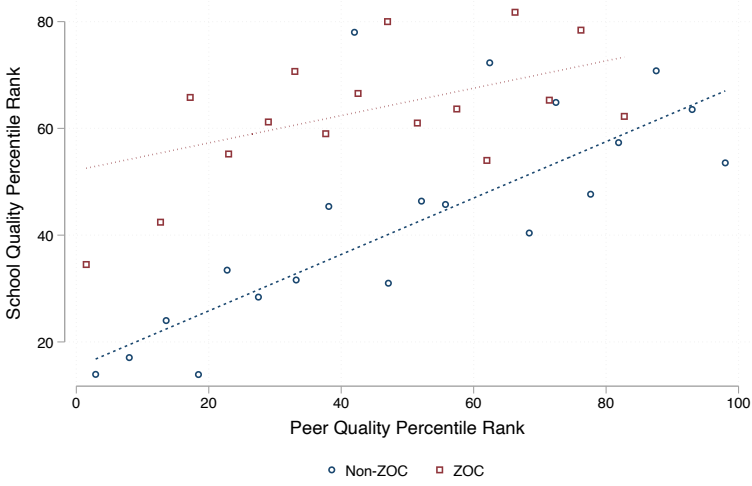
	(1) Uncontrolled	(2) Constant Effect
Forecast Coefficient	.63	1.111
	(.105)	(.134)
	[0]	[.41]
First-Stage F	277.507	37.016
Bias Tests:		
Forecast Bias (1 d.f.)	12.528	.683
	[0]	[.409]
Overidentification (180 d.f)	172.281	187.744
	[.647]	[.331]

Go back Go back to main

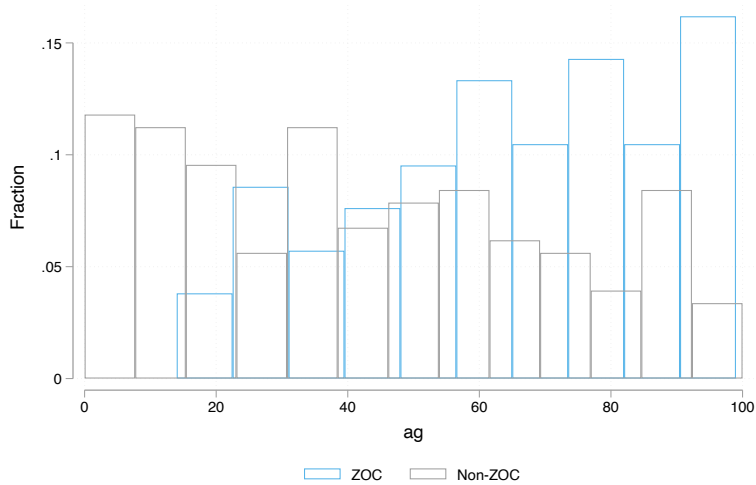
IA-AG Correlation



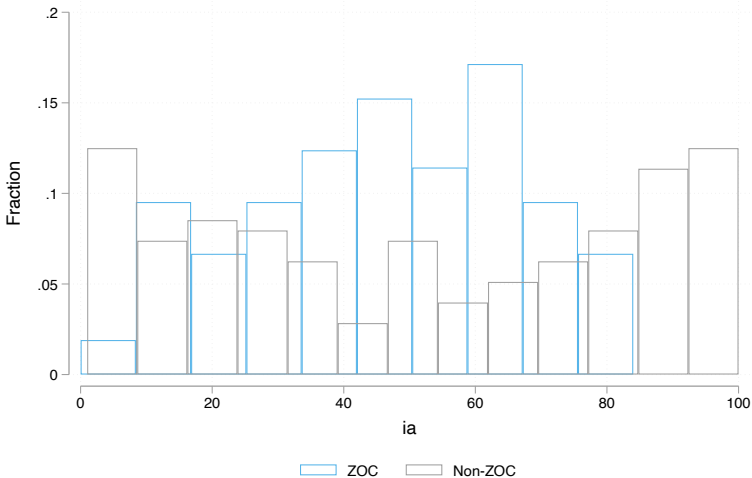
IA-AG Correlation



AG Support



IA Support



Treatment effects on other school attributes

	(1)	(2)	(3)	(4)	(5)
	Pure Control Mean	High Saturation 2019	Low Saturation 2019	High Saturation 2021	Low Saturation 2021
Achievement Growth	65.587	4.896**	1.033	8.775**	0.097
		(2.120)	(2.175)	(4.186)	(2.962)
Incoming Achievement	34.517	-1.540	-2.061	0.482	3.122
		(1.646)	(1.774)	(2.397)	(2.313)
Female	0.487	0.003	-0.001	0.006	-0.001
		(0.002)	(0.002)	(0.005)	(0.003)
Migrant	0.082	0.000	0.002*	-0.002	-0.001
		(0.001)	(0.001)	(0.003)	(0.002)
Poverty	0.979	0.000	0.003*	0.005	0.002
		(0.002)	(0.002)	(0.006)	(0.004)
Special Education	0.119	0.003**	0.001	0.004	0.000
		(0.001)	(0.001)	(0.004)	(0.002)
English Learner	0.146	0.002	0.004**	-0.010	0.000
		(0.003)	(0.002)	(0.009)	(0.005)
College	0.054	0.001	-0.002	0.002	0.000
		(0.002)	(0.002)	(0.006)	(0.003)
Black	0.044	0.000	0.000	-0.014	-0.003
		(0.002)	(0.001)	(0.013)	(0.004)
Hispanic	0.908	-0.002	0.002	0.008	0.002
		(0.003)	(0.003)	(0.014)	(0.007)
White	0.019	0.002*	-0.002	0.005	0.001
		(0.001)	(0.001)	(0.004)	(0.002)
Suspension Days	12.310	-0.572	0.162	-1.485	-0.582
		(0.605)	(0.545)	(3.517)	(2.832)
Suspension Incidents	0.007	0.000	0.000	-0.001	0.000
		(0.000)	(0.000)	(0.001)	(0.001)
N			69,054		

Go back

Treatment Effects across the Rank-Ordered List

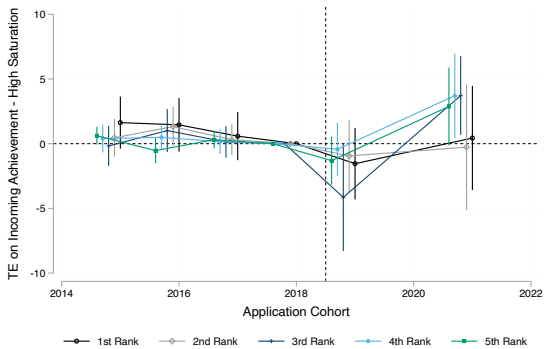


Figure: Effects on IA: High Saturation

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Treatment Effects across the Rank-Ordered List

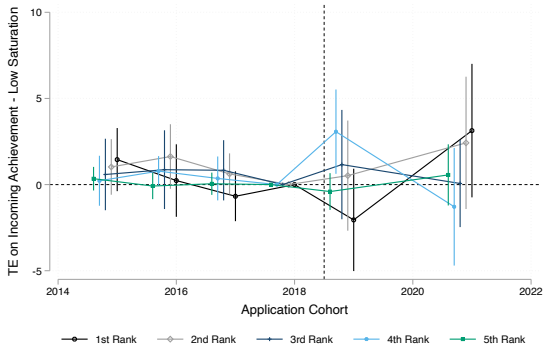


Figure: Effects on IA: Low Saturation

Go back

Treatment Effects across the Rank-Ordered List

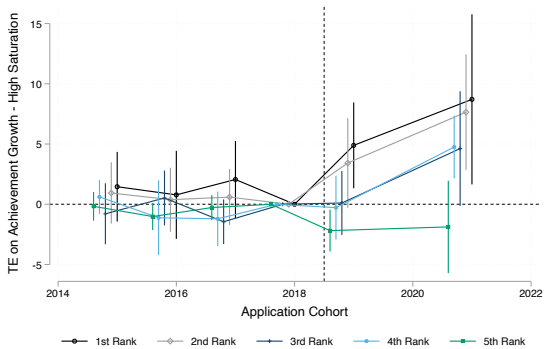


Figure: Effects on AG: High Saturation

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Treatment Effects across the Rank-Ordered List

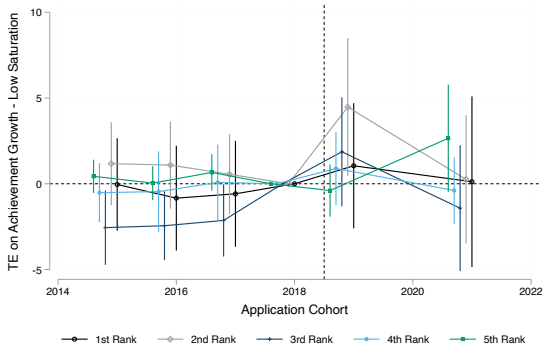


Figure: Effects on AG: Low Saturation

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Other Spillover Specifications

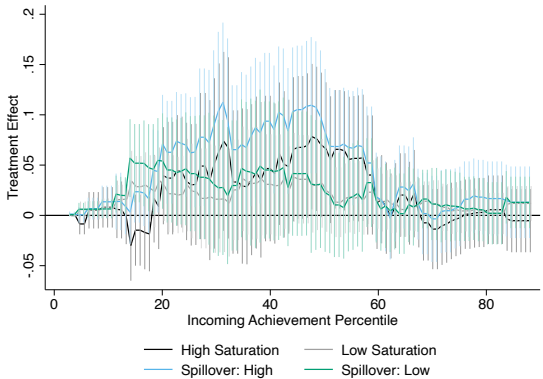


Figure: Impacts on IA Distribution

Other Spillover Specifications

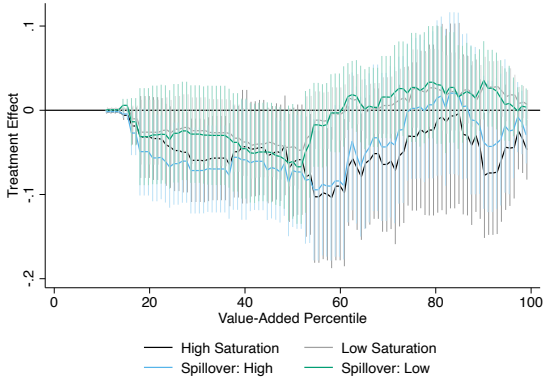
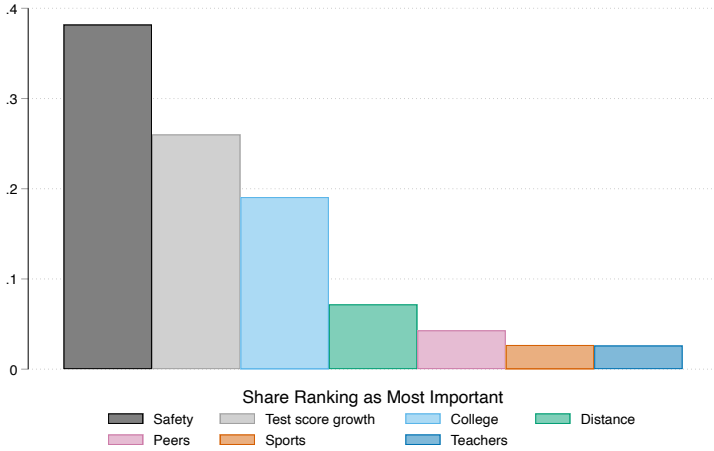
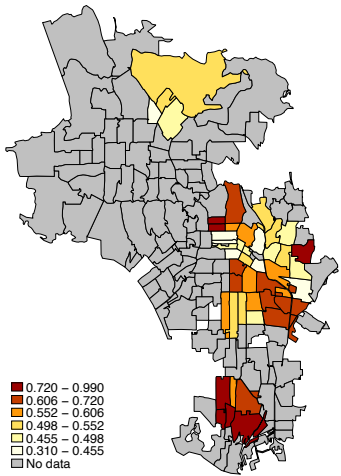


Figure: Impacts on AG Distribution

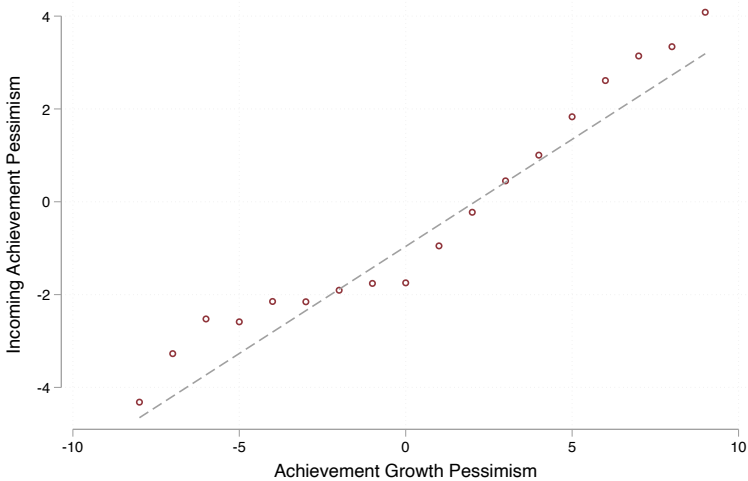
Survey Summary Statistics - Rankings of desired shcool characteristics



AG-IA Bias Correlation Across Space



Bias is positively correlated ($\rho \approx 0.45$)



Pessimism Correlates

	IA Pessimism		AG Pessimism	
	(1) Bivariate	(2) Multivariate	(3) Bivariate	(4) Multivariate
Parents College +	1.085 ***	0.627 ***	-0.009	0.126
	(0.179)	(0.197)	(0.197)	(0.220)
Hispanic	-0.883 ***	-0.243	0.844 ***	1.045 ***
	(0.178)	(0.196)	(0.258)	(0.288)
English Learner	-0.365 **	-0.146	-0.064	-0.247
	(0.152)	(0.167)	(0.189)	(0.210)
Special Education	0.202	0.354 *	0.202	0.211
	(0.157)	(0.171)	(0.182)	(0.201)
Black	0.723 **	0.499	-0.882 **	0.288
	(0.323)	(0.359)	(0.437)	(0.490)
White	0.924 **	0.279	-0.024	0.781
	(0.410)	(0.449)	(0.525)	(0.584)
Female	-0.091	-0.141	-0.094	-0.091
	(0.107)	(0.118)	(0.114)	(0.127)
Poverty	-1.708 ***	-1.572 ***	0.086	-0.154
	(0.171)	(0.190)	(0.197)	(0.220)
Math Z-Score	0.161 ***	-0.043	-0.040	-0.043
	(0.060)	(0.066)	(0.098)	(0.110)
Reading Z-Score	0.194 ***	0.158	-0.026	0.010
	(0.061)	(0.067)	(0.102)	(0.114)
Migrant	-1.265	-1.019	-1.484	-1.533
	(1.026)	(1.123)	(1.006)	(1.118)
Mean	-1.63		-0.52	
SD	2.07		2.26	

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Interpreting the β in a model *without* information frictions

Student i's indirect utility of enrolling in school j is

$$U_{ij} = -\lambda d_{ij} + \underbrace{\gamma_P Q_j^P + \gamma_S Q_j^S}_{Control} + \sum_{t \in \{P,S,B,Sp\}} \beta_{Pt} Q_j^P \times \mathbf{1}\{i \in \mathcal{I}_t\} + \beta_{St} Q_j^S \times \mathbf{1}\{i \in \mathcal{I}_t\} + \varepsilon_{ij}$$

- In a model without information frictions, the changes in WTT are due to salience (Bordalo et al. 2013)
- The lack of information gaps mean that any changes in choices are due to families re-prioritizing the importance of the two attributes

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Interpreting the β in a model *with* information frictions

Parents have beliefs about *true* Q_j^P and Q_j^S

$$\tilde{Q}_{ji}^P = (1 + b_{Pji})Q_j^p \qquad \tilde{Q}_{ji}^S = (1 + b_{Sji})Q_j^S$$

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$$\tilde{Q}_{ji}^P = (1 + b_{Pji})Q_j^p \qquad \tilde{Q}_{ji}^S = (1 + b_{Sji})Q_j^S$$

School- and individual-specific biases are jointly normal: $\begin{pmatrix} b_{Pji} \\ b_{Sji} \end{pmatrix} \sim \mathcal{N}\left(\begin{pmatrix} \mu_P \\ \mu_S \end{pmatrix}, \begin{pmatrix} \sigma_{Pb}^2 & \rho_b \sigma_{Pb} \sigma_{Sb} \\ \rho_b \sigma_{Pb} \sigma_{Sb} & \sigma_{Sb}^2 \end{pmatrix} \right)$

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Additional assumptions in a model with information frictions:

- Treated parents make choices with Q_j^P and Q_j^S, while the rest choose with their beliefs
- Constant effects; rules out heterogeneity with respect to initial biases

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Intuition:

- Differences in conditional choice probabilities between treated and untreated groups identify a summary measure of changes in WTT
- The summary measure nests both salience and information effects

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Survey moments allow for a decomposition of utility weight impacts

The treatment P impact on the utility weight for Q_j^P is

$$\tilde{\beta}_{PP} = \Big(\underbrace{\beta_{PP}}_{Salience} - \underbrace{\mu_P \gamma_P}_{Information\ Updating} \Big) \tag{1}$$

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- μ_P, μ_S : mean bias identified in the survey
- ρ_B, ρ_Q: beliefs and quality correlations identified in the survey
- $\sigma_{Sb}, \sigma_{Pb}, \sigma_S, \sigma_P$: belief and quality standard deviations identified in the survey
- γ_P, γ_S : utility weights for the control group

Survey moments allow for a decomposition of utility weight impacts

The treatment P impact on the utility weight for Q_j^P is

$$\tilde{\beta}_{PP} = \Big(\underbrace{\beta_{PP}}_{Salience} - \underbrace{\mu_P \gamma_P}_{Information\ Updating} \Big) \tag{1}$$

The utility weight impact on Q_j^S among those that only get treatment P is:

$$\tilde{\beta}_{SP} = \Big(\underbrace{\beta_{SP}(1 + \mu_S - \rho_B \frac{\sigma_{Sb}}{\sigma_{Pb}})}_{E[\tilde{Q_{ji}^S}|\mathbf{1}\{i \in \mathcal{I}_P\}]} - \underbrace{\gamma_P \rho_B \frac{\sigma_{Sb}}{\sigma_{Pb}}}_{E[\tilde{Q_{ji}^S}|\mathbf{1}\{i \in \mathcal{I}_P\}] - E[\tilde{Q_{ji}^S}]} \Big)$$

- μ_P, μ_S : mean bias identified in the survey
- ρ_B, ρ_Q: beliefs and quality correlations identified in the survey
- $\sigma_{Sb}, \sigma_{Pb}, \sigma_S, \sigma_P$: belief and quality standard deviations identified in the survey