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

Christopher Campos

University of Chicago Booth School of Business and NBER

March 2024

Reduced Form Evidenc

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

# Motivation

Motivation

••••••

- Parents' choices govern the success of school choice initiatives
  - $\rightarrow\,$  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)

- $\rightarrow$  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

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. 2023)
  - → Imperfect information introduces identification challenges (Abaluck, Compiani, and Zhang 2022)
  - $\rightarrow~$  **Open Question:** What do parents value?

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

# Motivation

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
  - $\rightarrow\,$  Are they aware of school and peer quality?
  - $\rightarrow$  Are their beliefs biased?
  - $\rightarrow~$  **Open Question:** What do parents know?

# Motivation

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, Cohodes et al. 2022)
  - → Social interactions and networks potentially mediate enrollment-based school quality gaps (Hahm and Park 2023)
  - $\rightarrow~$  Newer Question: How important are social interactions in the school choice process?

Reduced Form Evi

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior

# Motivation

Motivation

0000

- 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
- **This paper:** Jointly study how information, preferences, and social interactions shape choices in education markets and provide evidence on these open questions

Reduced Form Evidenc

Survey Evidence

Discrete Choice Evidence

# This paper

Motivation

0000

- 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. **Information campaign mechanisms:** How do information interventions work? Can we differentiate between a salience and information channel?

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

# This paper

Motivation

- 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. **Information campaign mechanisms:** How do information interventions work? Can we differentiate between a salience and information channel?
- Setting: Los Angeles
  - ightarrow 106 middle schools feed into Zones of Choice (ZOC) markets
  - ightarrow ~ ~23,000 students part of the experimental sample
  - ightarrow Two experimental waves, 2019 and 2021

# This paper

Motivation

0000

- 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. **Information campaign mechanisms:** 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
  - $\rightarrow~$  Elicit beliefs about peer and school quality at baseline
  - $\rightarrow~$  Distribute information about peer quality and school quality
  - ightarrow Spillover design allows us to infer the empirical relevance of social interactions

Reduced Form Evider

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior

# 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 mechanisms

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

### **Evidence of Social Interactions Shaping Demand**

- 5. Indirectly treated families respond in the same way as treated parents
- 6. Effects are similar at the mean and across the distribution

#### Impacts on Outcomes

- 7. Non-cognitive outcomes improve (0.04-0.09 $\sigma$  increase on a variety of indices)
- 8. Cognitive outcomes (test scores) do not improve

Survey Evider

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## Related Literature

#### 1. Parents' Preferences

Rothstein 2006; Cullen et al. 2006; Hastings, Kane, and Staiger 2009; Harris 2015; Burgess et al. 2015; Imberman and Lovenheim 2016; Abdulkadiroglu et al. 2020; Ainsworth et al. 2023; Beuermann et al. 2023 Contribution: Use information provision to isolate changes in preferences

# Related Literature

#### 1. Parents' Preferences

Rothstein 2006; Cullen et al. 2006; Hastings, Kane, and Staiger 2009; Harris 2015; Burgess et al. 2015; Imberman and Lovenheim 2016; Abdulkadiroglu et al. 2020; Ainsworth et al. 2023; Beuermann et al. 2023 Contribution: Use information provision to isolate changes in preferences

#### 2. Information in education markets and the role of salience

Hastings and Weinstein 2008; Bordalo et al. 2013; Mizala and Urquiola 2015; Andrabi et al. 2017; Corcoran et al. 2018; Allende et al. 2019; Haaland et al. 2021; Arteaga et al. 2022; Bordalo et al. 2022; Cohodes et al. 2022; Ainsworth et al. 2023

#### Contributions:

- ightarrow Collect information about beliefs and randomize two measures of quality
- ightarrow Decompose treatment effects into salience and information updating channels

l Form Evidence

vey Evidence

Discrete Choice Evidence

## **Related Literature**

#### 1. Parents' Preferences

Rothstein 2006; Cullen et al. 2006; Hastings, Kane, and Staiger 2009; Harris 2015; Burgess et al. 2015; Imberman and Lovenheim 2016; Abdulkadiroglu et al. 2020; Ainsworth et al. 2023; Beuermann et al. 2023 Contribution: Use information provision to isolate *changes* in preferences

#### 2. Information in education markets and the role of salience

Hastings and Weinstein 2008; Bordalo et al. 2013; Mizala and Urquiola 2015; Andrabi et al. 2017; Corcoran et al. 2018; Allende et al. 2019; Haaland et al. 2021; Arteaga et al. 2022; Bordalo et al. 2022; Cohodes et al. 2022; Ainsworth et al. 2023

#### Contributions:

- ightarrow Collect information about beliefs and randomize two measures of quality
- ightarrow Decompose treatment effects into salience and information updating channels

### 3. Social interactions

Banerjee 1992; Bertrand et al. 2000; Manski 2000; Brock and Durlauf 2002; Duflo and Saez 2003; 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

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

mpacts on Outcomes

Conclusion

# Roadmap

Setting

- 1. Setting and Experiment Design
- 2. Reduced Form Evidence
- 3. Survey Evidence: AG and IA Bias
- 4. Discrete Choice Framework
  - $\rightarrow$  Utility weight impacts
  - $\rightarrow~$  Decomposition of utility weight impacts
- 5. Impacts on Outcomes
  - $\rightarrow$  Enrollment
  - $\rightarrow~$  Cognitive and non-cognitive outcomes
- 6. Concluding Thoughts

Motivation

Setting Experiment

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

mpacts on Outcomes

Conclusion

# Setting

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

# Setting: Zones of Choice

- ZOC is a neighborhood-based public school choice program
- Sixteen mutually exclusive high school markets within Los Angeles
  - $\rightarrow~$  Parents' choice sets are fixed and specific to their neighborhood
  - ightarrow Schools and neighborhoods are segregated in terms of race/ethnicity and SES
- Students apply to high schools in the Fall of Grade 8
  - $\rightarrow$  Middle schools feed into particular markets
  - ightarrow Students enrolled in feeder middle schools in 2019 and 2021 are the experimental sample
  - ightarrow Families are required to rank all options in their zone of choice in their application



Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion



Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O



Experiment Design Re 00000000 0

Reduced Form Evidence

urvey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O



Middle Schools

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O



educed Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## ZOC and Non-ZOC Student Differences



- ZOC Achievement Gap:  $0.22\sigma$
- Hispanic Share: 0.90
- Poverty Share: 0.94
- College Graduate Share: 0.12
- ZOC students represent roughly 30-40 percent of LAUSD high school students



periment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

### ZOC markets located in disadvantaged neighborhoods of LA County





kperiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

### ZOC markets located in disadvantaged neighborhoods of LA County



Motivation

Experiment Design

Setting

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

mpacts on Outcomes

Conclusior O

# Experiment Design

9/33

Setting Ex

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion O

# Timeline

- 1. Baseline Survey: Early September
  - $\rightarrow~$  Distributed in the classroom and via text message
  - ightarrow Include a video that teaches parents about the differences between school and peer quality
  - $\rightarrow$  Collect baseline beliefs

# Timeline

- 1. Baseline Survey: Early September
  - $\rightarrow~$  Distributed in the classroom and via text message
  - ightarrow Include a video that teaches parents about the differences between school and peer quality
  - $\rightarrow$  Collect baseline beliefs
- 2. Information provision: Late September
  - → Cross-randomize school and peer quality
  - $\rightarrow\,$  Treatment-specific videos that help parents understand the information

# Timeline

- 1. Baseline Survey: Early September
  - $\rightarrow~$  Distributed in the classroom and via text message
  - ightarrow Include a video that teaches parents about the differences between school and peer quality
  - $\rightarrow$  Collect baseline beliefs
- 2. Information provision: Late September
  - → Cross-randomize school and peer quality
  - $\rightarrow\,$  Treatment-specific videos that help parents understand the information
- 3. Applications submitted: October-November

 Motivation
 Setting
 Experiment Design

 00000
 00000
 000000

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

# Baseline Survey

## **Survey Goals:**

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

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

# 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? • • Details

## Researcher definition of school and peer quality:

- $\rightarrow$  School quality is estimated school value-added
- $\rightarrow~$  Peer quality is analogous to school average test scores
- $\rightarrow$  School quality validated using lotteries (Angrist et al. 2017)

## Definition for parents:

- $\rightarrow~$  School quality is referred to as Achievement Growth (AG)
- $\rightarrow~$  Peer quality is referred to as Incoming Achievement (IA)

 Setting
 Experiment Design

 00
 00000
 0000000

Reduced Form Eviden

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

# **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? • Details
- 2. Many degrees of freedom in eliciting beliefs
  - ightarrow Ask parents to assess where schools in their choice set rank across all other schools in the district
  - $\rightarrow\,$  For example: For AG (or IA), is School A in the Top 10%, 80-90%, ...?
  - $\rightarrow\,$  I collect beliefs about the decile parents think their schools belong to

Ation Setting Experiment Design

Reduced Form Evidenc

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

# 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?
- ▶ Details
- 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:
  - ightarrow Survey includes a video that helps explain the differences between school and peer quality
  - $\rightarrow~$  Use visual aids to explain the differences

Motivation

00

Setting 00000 Experiment Design

Reduced Form Evidence

Survey Evident

Discrete Choice Evidence

mpacts on Outcomes

Conclusior O

## Video

Watch Video English Spanish ivation Setting

Experiment Design

Reduced Form Evidence

Survey Evidenc

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## Signal the information is on behalf of the school district



Motivation Setting

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusio O

## Introduce the two concepts



Motivation Setting

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusio O

## Use visual aid to describe IA



Motivation Setting 00000 00000

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## Use visual aid to describe AG


Experiment Design F 00000000 00

Reduced Form Evidenc

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion O

#### Describe some differences but remain agnostic about which is better



tivation Setting

Experiment Design

Reduced Form Evidenc

Survey Evidenc

Discrete Choice Evidence

Impacts on Outcomes

Conclusion O

#### Remind parents that test scores are not all they should consider



Motivation Setting

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

#### Goals:

- 1. Better understand parents' valuations of peer and school quality
- 2. Cross-randomize peer and school quality

Identify social interactions

• Two-stage randomization (Philipson 2000; Crepon et al. 2013)







Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

#### Data

- LAUSD administrative student data 2015-2021
  - $\rightarrow$  Demographics, Test Scores, Addresses
- LAUSD School Experience Survey (SES)
  - $\rightarrow~$  Student-level socio-emotional and non-cognitive outcome data
- Zones of Choice data 2015-2021
  - $\rightarrow$  Applications containing rank-ordered lists
- Survey data
  - $\rightarrow$  Baseline beliefs
  - $\rightarrow$  Baseline rank-ordered list

Motivation

Experiment I

Setting

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

mpacts on Outcomes

Conclusior O

# **Reduced Form Evidence**





#### Difference-in-differences

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

- Y<sub>i</sub>: 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

## Increased demand for AG among treated in high saturation schools

Reduced Form Evidence

Discrete Choice Evidence

Experiment Design

Setting



Discrete Choice Evidence

Reduced Form Evidence

00000

Setting

Experiment Design



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

Reduced Form Evidence

Discrete Choice Evidence

Experiment Design

Setting



Reduced Form Evidence

Experiment Design

Setting



## No detectable impacts on demand for IA for all treatment groups

Discrete Choice Evidence

Reduced Form Evidence

00000

Setting

Experiment Design



## No detectable impacts on demand for IA across all treatment groups

Discrete Choice Evidence

Reduced Form Evidence

00000

Setting

Experiment Design



#### No detectable impacts on demand for IA across all treatment groups

Discrete Choice Evidence

Reduced Form Evidence

00000

Setting

Experiment Design



#### No detectable impacts on demand for IA across all treatment groups

Discrete Choice Evidence

Reduced Form Evidence

00000

Setting

Experiment Design





#### **Distributional Impacts**

 $\mathbf{1}\{Y_{i} \le a\} = \alpha_{z(i)t(i)} + \alpha_{g(i)} + \gamma' X_{i} + \beta_{P} D_{it(i)}^{P} + \beta_{S} D_{it(i)}^{S} + \beta_{B} D_{it(i)}^{B} + \beta_{C} C_{it(i)} + u_{i},$ 

•  $1{Y_i \leq a}$  as an outcome recovers effects on the CDF of Y at different points of support  $a \in [\underline{a}, \overline{a}]$ 

• Report estimates from 100 separate regressions at different points of support



#### **Distributional Impacts**

 $\mathbf{1}\{Y_{i} \le a\} = \alpha_{z(i)t(i)} + \alpha_{g(i)} + \gamma' X_{i} + \beta_{P} D_{it(i)}^{P} + \beta_{S} D_{it(i)}^{S} + \beta_{B} D_{it(i)}^{B} + \beta_{C} C_{it(i)} + u_{i},$ 

- $1{Y_i \leq a}$  as an outcome recovers effects on the CDF of Y at different points of support  $a \in [\underline{a}, \overline{a}]$
- Report estimates from 100 separate regressions at different points of support
- $D_{it(i)}^X$ : individual *i* treatment X indicator for cohort t
- $C_{it(i)}$ : individual *i* spillover indicator for cohort *t*
- $\beta_P, \beta_S, \beta_B, \beta_{Spill}$ : Treatment-specific effects, ignoring saturation groups



#### **Distributional Impacts**

 $\mathbf{1}\{Y_{i} \leq a\} = \alpha_{z(i)t(i)} + \alpha_{g(i)} + \gamma' X_{i} + \beta_{P} D_{it(i)}^{P} + \beta_{S} D_{it(i)}^{S} + \beta_{B} D_{it(i)}^{B} + \beta_{C} C_{it(i)} + u_{i},$ 

- $1{Y_i \leq a}$  as an outcome recovers effects on the CDF of Y at different points of support  $a \in [\underline{a}, \overline{a}]$
- Report estimates from 100 separate regressions at different points of support
- $D_{it(i)}^X$ : individual *i* treatment X indicator for cohort t
- $C_{it(i)}$ : individual *i* spillover indicator for cohort *t*
- $\beta_P, \beta_S, \beta_B, \beta_{Spill}$ : Treatment-specific effects, ignoring saturation groups
- Distributional estimates demonstrate that demand moved uniformly across the distribution, regardless of individual treatment status

Survey Eviden

Conclusion O

#### Distributional effects show increased demand for higher AG schools



Survey Eviden

Discrete Choice Evidence

Conclusion O

#### Distributional effects show an increased demand for higher AG schools



Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Conclusion

#### Distributional Effects show an increased demand for higher AG schools



#### Spillover effects identical to treatment effects across the distribution



Motivation

Experimen

Setting

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

mpacts on Outcomes

Conclusion O

# Survey Evidence

20/33

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

## Survey Evidence

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

#### Today:

- Beliefs elicited in decile units
- 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

Survey Evidence

0000

#### Beliefs by Position of the Rank-Ordered List



- Parents tend to think their schools have higher AG rankings than IA rankings; this is true
- Parents tend to think schools in their choice set are above average in terms of IA and AG: this is not always true for IA
- A steep gradient in beliefs moving down the ROL is indicative of signal in beliefs

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion O

### 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)

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

mpacts on Outcomes

Conclusion

## 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)

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion O

## 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)
- Biases are choice relevant

Motivation

Experiment

Setting

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

# **Discrete Choice Evidence**

Survey Evidenc

## The Information Campaign Viewed Through a Discrete Choice Lens

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
- $\varepsilon_{ij}$  : unobserved preference heterogeneity



#### The Information Campaign Viewed Through a Discrete Choice Lens

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

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

•  $1{i \in \mathcal{I}_t}$  correspond to treatment  $t \in {IA(P), AG(S), IA and AG(B), Spillover(Sp)}$  indicators



#### The Information Campaign Viewed Through a Discrete Choice Lens

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

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

- $1{i \in I_t}$  correspond to treatment  $t \in {IA(P), AG(S), IA and AG(B), Spillover(Sp)}$  indicators
- $E[MWTT_{i0}^{P}] \equiv \frac{\gamma_{P}}{\lambda}$ : marginal willingness to travel for peer quality among pure control group
- $E[\Delta MWTT_{iP}^{P}] \equiv E[MWTT_{iP}^{P}] E[MWTT_{i0}^{P}] = \frac{\beta_{PP}}{\lambda}$ : summarizes impact on MWTT for peer quality among those in treatment group P

### The Information Campaign Viewed Through a Discrete Choice Lens

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

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

- $1{i \in I_t}$  correspond to treatment  $t \in {IA(P), AG(S), IA and AG(B), Spillover(Sp)}$  indicators
- $E[MWTT_{i0}^{P}] \equiv \frac{\gamma_{P}}{\lambda}$ : marginal willingness to travel for peer quality among pure control group
- $E[\Delta MWTT_{iP}^{P}] \equiv E[MWTT_{iP}^{P}] E[MWTT_{i0}^{P}] = \frac{\beta_{PP}}{\lambda}$ : summarizes impact on MWTT for peer quality among those in treatment group P
- Assumptions for estimation: EVT1 errors and truthful reporting
Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## Information Campaign Effects



- $\Delta$  MWTT IA:  $\sim$  -1km/Decile
- $\Delta$  MWTT AG:  $\sim$  0.5km/Decile
- Treatment effects similar for all treatments; mirrors reduced form evidence
- Structural model replicates
  reduced form effects
  Evidence
- Utility weight impacts are a summary measure, nesting both information and salience effects

urvey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior

## Introducing Imperfect Information

• Define beliefs about  $Q_j^P$  and  $Q_j^S$  as

 $\tilde{Q}_{ji}^P = (1 + b_{Pi})Q_j^p$  $\tilde{Q}_{ji}^S = (1 + b_{Si})Q_j^S$ 

where biases  $b_{Pi}$  and  $b_{Si}$  have mean  $\mu_P$  and  $\mu_S$ , respectively

• The biases (b<sub>Pi</sub>, b<sub>Si</sub>) are proportional deviations away from the researcher-generated measures

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## Introducing Imperfect Information

• Define beliefs about  $Q_j^P$  and  $Q_j^S$  as

 $\tilde{Q}_{ji}^P = (1 + b_{Pi})Q_j^P$  $\tilde{Q}_{ji}^S = (1 + b_{Si})Q_j^S$ 

where biases  $b_{Pi}$  and  $b_{Si}$  have mean  $\mu_P$  and  $\mu_S$ , respectively

- The biases (*b<sub>Pi</sub>*, *b<sub>Si</sub>*) are proportional deviations away from the researcher-generated measures
- Key assumption: In a model with imperfect information, assume treated parents choose schools with  $Q_j^P$  and/or  $Q_j^S$  and pure control parents choose with their beliefs

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## Decomposing treatment effects

• Interested in decomposing the following estimand:

$$E[\Delta MWTT_i^P] \equiv E[MWTT_{iP}^P - MWTT_{i0}^P]$$

- Observed average MWTT for  $Q_j^P$  among those in the pure control group:  $E[MWTT_{i0}^P] = \frac{\gamma_P(1+\mu_P)}{\lambda}$
- Observed average MWTT among those receiving treatment P:  $E[MWTT_{iP}^{P}] = \frac{\gamma_{P} + \beta_{PP}}{\lambda}$
- Therefore,

$$E[\Delta MWTT_i^P] = \frac{\beta_{PP} - \gamma_P \mu_P}{\lambda}$$



Experiment Design

Reduced Form Evidence

rvey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

#### **Decomposition Results**

Salience accounts for most of the impacts for both IA and AG



Motivation

Experiment

Setting

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior

# Impacts on Outcomes

Reduced Form Evid

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

## Outcomes of Interest

- 1. Enrollment
  - ightarrow Previous evidence relates to application behavior but congestion potentially attenuates enrollment impacts
- 2. Test Scores
  - ightarrow Observed in eleventh-grade and only available for 2019 cohort
- 3. Non-cognitive outcomes collected in School Experience Survey
  - → Following Jackson et al. 2020, I organize non-cognitive outcome data into five standardized indices (Kling, Liebman, and Katz 2007):
    - 3.1 Happiness
    - 3.2 Interpersonal Skills
    - 3.3 School Connectedness
    - 3.4 Academic Effort
    - 3.5 Bullying

Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

#### Students enroll in higher quality schools



Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

#### No Test Score Impacts

The pandemic interfered with educational trajectories of 2019 cohort



Motivation Setting 00000 00000 Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

#### Non-cognitive outcomes improve

Only bullying-related outcomes improve for 2019 cohort



Motivation Setting 00000 00000 Experiment Design

Reduced Form Evidence

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusior O

#### Non-cognitive outcomes improve

#### All non-cognitive outcomes improve for 2021 cohort



Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## Concluding Thoughts

#### What Parents Know and Value

- What parents know: Parents' bias is not severe on average but there is substantial dispersion in beliefs
- What parents value: Parents respond more to variation and information about school than peer quality
- VA-oriented campaigns have the potential to affect demand for effective schools and school enrollment segregation

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## Concluding Thoughts

#### What Parents Know and Value

- What parents know: Parents' bias is not severe on average but there is substantial dispersion in beliefs
- What parents value: Parents respond more to variation and information about school than peer quality
- VA-oriented campaigns have the potential to affect demand for effective schools and school enrollment segregation

#### Social interactions and their implications

- This paper documents 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

Survey Evidence

Discrete Choice Evidence

Impacts on Outcomes

Conclusion

## Concluding Thoughts

#### What Parents Know and Value

- What parents know: Parents' bias is not severe on average but there is substantial dispersion in beliefs
- What parents value: Parents respond more to variation and information about school than peer quality
- VA-oriented campaigns have the potential to affect demand for effective schools and school enrollment segregation

#### Social interactions and their implications

- This paper documents 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

Motivating Evidence

Design Quality Defin 0 0000000

Definition and Validation

educed Form Evidence

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

## Thank you!

Christopher.Campos@chicagobooth.edu

### Motivation: Rise of Centralized Choice in Public Education Systems

Adoption of Centralized Choice and Assignment System



Reduced Form Evid

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

#### Motivation: Rise of Centralized Choice in Public Education Systems



Design Quality

Quality Definition and Validation

Reduced Form Evidence

Survey Evidence Di

Discrete Choice Evic

Evidence of Strategic Behavior

#### Most ZOC neighborhoods classified as low mobility by Chetty et al. (2018)



Design Quality

uality Definition and Validation

Reduced Form Evidence

Survey Evidence Di

Discrete Choice Evic

Evidence of Strategic Behavior

#### Most ZOC neighborhoods classified as low mobility by Chetty et al. (2018)



0

Discrete Choice

Evidence of Strategic Behavior

### **Descriptive Statistics**

Data

00000

	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	



0

Reduced Form Evidence

Discrete Choice

Evidence of Strategic Behavior

## **Descriptive Statistics**

Data

00000

	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	,



Discrete Choice

Evidence of Strategic Behavior

## **Descriptive Statistics**

Data

	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	



Design Quality

Quality Definition and Vali 00000000 Reduced Form Evidence

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

### **Descriptive Statistics**

Data

00000

	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	



Motivating Evidence 0

Design 0

Data 00●00

Quality Definition and Validation

Reduced Form Evidence

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

	(1)	(2)	(3)
	No Survey	Partial	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

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

#### School-level Balance

	Control	Low - Control	High - Control
	(1)	(2)	(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	40	32	32



Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

#### Student-level Balance (within treated schools)

						$\frown$
	Pure Control	Control	Peer - Control	School - Control	Both - Control	P-value
	(1)	(2)	(3)	(4)	(5)	(6)
ELA Scores	- 121	- 124	- 005	- 027	- 016	531
LLA GUOICS	.121	.124	(026)	(02)	(023)	.001
Math Scores	- 124	- 122	004	- 021	- 016	475
			(.023)	(.017)	(.019)	
Parents College	.08	.074	O Ó	0	001	.999
			(.008)	(.005)	(.007)	
Migrant	.037	.032	.008	001	.01	.172
			(.004)	(.004)	(.007)	
Female	.485	.488	008	002	01	.85
			(.01)	(.013)	(.017)	
Poverty	.945	.933	.002	.001	003	.476
			(.004)	(.004)	(.004)	
Special Education		.14	001	.009	.006	.531
			(.008)	(.008)	(.008)	
English Learners	.153	.154	.001	0	.014	.406
			(.006)	(.007)	(.009)	
Black	.039	.027	.004	002	002	.526
			(.004)	(.004)	(.003)	
Hispanic	.902	.908	005	.003	001	.744
			(.006)	(.007)	(.006)	
White	.018	.015	002	0	002	.81
			(.003)	(.003)	(.003)	$\square$
Joint Test P-value			.883	.979	.987	
Number of Students	8,610	5,344	3,329	3,351	2,534	



Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

#### Student-level Balance (within treated schools)

	Pure Control	Control	Peer - Control	School - Control	Both - Control	P-valu
	(1)	(2)	(3)	(4)	(5)	(6)
ELA Scores	121	124	005	027	016	.531
			(.026)	(.02)	(.023)	
Math Scores	124	122	.004	021	016	.475
			(.023)	(.017)	(.019)	
Parents College	.08	.074	0	0	001	.999
			(.008)	(.005)	(.007)	
Migrant	.037	.032	.008	001	.01	.172
			(.004)	(.004)	(.007)	
Female	.485	.488	008	002	01	.85
			(.01)	(.013)	(.017)	
Poverty	.945	.933	.002	.001	003	.476
			(.004)	(.004)	(.004)	
Special Education		.14	001	.009	.006	.531
			(.008)	(.008)	(.008)	
English Learners	.153	.154	.001	0	.014	.406
			(.006)	(.007)	(.009)	
Black	.039	.027	.004	002	002	.526
			(.004)	(.004)	(.003)	
Hispanic	.902	.908	005	.003	001	.744
			(.006)	(.007)	(.006)	
White	.018	.015	002	0	002	.81
			(.003)	(.003)	(.003)	$ \frown $
Joint Test P-value			.883	.979	.987	
Number of Students	8,610	5,344	3,329	3,351	2,534	

#### Motivating Evidence

#### Design

Quality Definition and Validation

Survey Evidence

Evidence of Strategic Behavior

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.

We measure a school's ability improve test scores by measuring the growth of their students' test scores between entry into 1-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	Bizabeth 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	Bizabeth 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



· .....

1

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

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

#### Zona de Opción Bell

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

Esta medida tiene dos partes que debe considerar, una que mide la capacidad de la escuela nara 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. Aigunos nadras puedes preferir escuelas con alto rendimiento entrante vintros puedes. preferir escuelas con alto crecimiento de logros. A continuación, proporcionamos la clasificación de cada escuela comparado a todas escuelas en el distrito.

#### 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, Tecnologia, Ingenieria, 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	Dizabeth LC	Comunidad Educativa Pequeña (SLC)
Academia de Aprendizaje Enlazado/ Carrera de Profesores Multilingües	63	50	Bell HS	Academia de Aprendizaje Enlazado
Academia de Ciencia, Tecnologia, Ingeniería, Artes y Matemáticas (STEAM)	47	82	Maywood Academy	Comuniciad 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)





sus estudiantes entre el ingreso a la

escuela y el onceavo grado.

Crecimiento de logros Madimos la canacidad de una escuela para mejorar los puntajes de los exámenes midiendo el crecimiento de los puntales de los exámenes de



Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

## School and Peer Quality Definition

 $Y_{ij} = \mu_j + a_i$ 

- $Y_{ij}$  is student *i*'s potential achievement at school *j*
- $\mu_j$  is school j mean potential outcome
- *a<sub>i</sub>* is mean-zero student ability

Survey Evidence

iscrete Choice

Evidence of Strategic Behavior

## School and Peer Quality Definition

 $Y_{ij} = \mu_j + a_i$ 

- $Y_{ij}$  is student *i*'s potential achievement at school j
- $\mu_j$  is school j mean potential outcome
- *a<sub>i</sub>* 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

Reduced Form Evider

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

#### School and Peer Quality Definition



Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

## School and Peer Quality Definition



• School Quality is referred to as Achievement Growth and is defined as

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

• Peer Quality is referred to as Incoming Achievement and is defined as

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

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

#### Peer Effects: Observables do not correlate with school quality

	(1)	(2)	(3)	(4)
	(0)	(2)	(0)	(4)
	aj	aj	$\alpha_j$	aj
Poverty Share			0.457	0.534
			(0.326)	(0.355)
Black Share			-0.625*	-0.617
			(0.365)	(0.385)
White Share			-0.511	-0.425
			(0.516)	(0.563)
College Share			0.464	0.307
			(0.918)	(0.940)
English Learner Share			-0.408	-0.349
			(0.365)	(0.403)
English at Home Share			0.155	-0.0106
			(0.337)	(0.377)
Spanish at Home Share			0.242	0.0917
			(0.249)	(0.291)
Special Education Share			0.244	0.309
			(0.412)	(0.399)
Female Share			0.0375	0.0584
			(0.139)	(0.137)
Migrant Share			0.289	0.212
			(0.336)	(0.362)
Lagged ELA Achievement	0.0531			0.0231
	(0.0472)			(0.0841)
School Enrollment		0.000289		0.000441
		(0.000414)		(0.000338)
R-squared	0.011	0.010	0.156	0.176

#### Peer Effects: Regression-adjusted rankings preserve ordinal rankings



Non-ZOC
 ZOC

0

0

Discrete Choice

Evidence of Strategic Behavior

## VAM Validation

	(1)	(2)
	Uncontrolled	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]

## **IA-AG** Correlation



Estimated School Quality (Student  $\boldsymbol{\sigma})$
Reduced Form Evider

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

## **IA-AG** Correlation



School Quality Percentile Rank

• Non-ZOC • ZOC

Motivating Evidence

Quality Definition and Validation 0000000

Survey Evidence

Evidence of Strategic Behavior

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.

#### 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	Bizabeth 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	Bizabeth 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



4

1

Incoming achievement is the average test

We measure a school's ability improve test

scores by measuring the growth of their

students' test scores between entry into

time they enter school

Achievement Growth

the school and eleventh grade.

scores of school's incoming students at the

Estamos proporcionando información sobre las escuelas dentro de su Zona de Opción, para asegurarnos de que tenga la meior 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 nara 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 lorros 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.

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	Dizabeth LC	Comunidad Educativa Pequeña (SLC)
Academia de Aprendizaje Enlazado/ Carrera de Profesores Multilingües	63	50	Bell HS	Academia de Aprendizaje Enlazado
Academia de Ciencia, Tecnologia, 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)





Crecimiento de logros Madimos la canacidad de una escuela para mejorar los puntajes de los examenes midiendo el crecimiento de los puntajes de los exámenes de sus estudiantes entre el ingreso a la escuela y el onceavo grado.

Go Bac

# Motivating Evidence Data Design Quality Definition and Validation Reduced Form Evidence Survey Evidence Discrete Choice Evidence of Strategic Behavior

#### Treatment effects on other school attributes

Pure Control Mean High Saturation 2019 Low Saturation 2020   Achievement Growth 6.5.587 4.8.96** 1.033 (4.12) (4.186) (2.962)   Low Saturation 2020 (2.175) (4.186) (2.92) (3.93) [1.373]   nononing Achievement 3.5.17 -7.540 -2.061 0.482 (3.122)   Female 0.487 0.002 -0.002* (0.003) (0.003)   Female 0.487 0.002 -0.002* 0.000 (0.000)   Log Saturation 0.082 0.000 0.002** -0.001 0.000   Migrant 0.082 0.001 0.0005* 0.003 0.001   Poverty 0.979 0.001 0.002** 0.001 0.003 0.001   Special Education 0.119 (2.03) (0.001) (0.003) (0.003) 0.001		(1)	(2)	(3)	(4)	(5)
Achievement 65.587 4.896+** 1.033 8.775** 0.097   Achievement (2120) (2175) (4.186) (2.962)   Incoming Achievement 34.517 -1.540 -2.061 0.482 3.122   (1643) (1724) (2.397) (2.213) (2.217) (2.213)   (1744) (2.397) (2.213) (2.217) (2.231)   (1744) (0.001) (0.004) (0.003) (0.001)   Fernale 0.487 (0.001) (0.001) (0.003) (0.001)   (1001) (0.001) (0.003) (0.001) (0.003) (0.001)   (1393) (0.55] [343] [443] [443]   Poverty 0.79 (0.001) (0.003) (0.003) (0.003)   [393] (0.55] [343] [443] [443]   Special Education 0.19 (0.002) (0.003) (0.003)   [393] [139] [139] [132] [134] [345]		Pure Control Mean	High Saturation 2019	Low Saturation 2019	High Saturation 2021	Low Saturation 2021
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Achievement Growth	65.587	4.896**	1.033	8.775**	0.097
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			(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) (2.33) [275] [282] [395] [0.68]   Female 0.487 0.002 -0.002* 0.005 -0.001   Migrant 0.082 0.000 0.000* -0.001 0.000   Migrant 0.082 0.000 0.000* -0.001 0.000   Poverty 0.979 (0.001) (0.003) (0.003) (0.003)   Poverty 0.19 0.003* 0.001 0.003 0.002   Poverty 0.19 0.003* 0.001 0.003 0.003   Special Education 0.19 0.03** 0.001 0.003 0.001   Special Education 0.19 0.003* 0.001 0.003 0.001   English Learner 0.46 0.001 0.002* 0.001 0.001 0.001   English Learner 0.46 0.001 0.001 0.001 0.001			[.053]	[.412]	[.055]	[.373]
Fenale (1346) (1774) (2.37) (2.313)   Fenale 0.487 0.002 0.003 0.005 -0.01   (0.001) (0.003) (0.003) (0.002) 0.005 -0.01   (0.001) (0.003) (0.002) 0.005 -0.01 0.000   (0.001) (0.001) (0.003) (0.007) (0.007) (0.007)   (0.001) (0.001) (0.003) (0.007) (0.007) (0.007)   Poverty 0.99 (0.01) 0.005 0.002 (0.003) (0.003)   Special Education 0.19 0.03** 0.001 0.003 (0.003)   Special Education 0.19 0.003** 0.001 0.003 (0.003)   Special Education 0.19 0.003** 0.001 0.003 (0.003)   English Learner 0.46 0.001 0.002 0.001 (0.003) (0.002)   College 0.54 0.000 -0.001 -0.011 -0.002   Idas	Incoming Achievement	34.517	-1.540	-2.061	0.482	3.122
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			(1.646)	(1.774)	(2.397)	(2.313)
Female 0.487 0.002 -0.003 0.005 -0.001   (0001) (0.0004) (0.002) (0.002) (0.002) (0.002)   (203) [0.083] [188] [263]   (0.001) (0.003) (0.003) (0.003)   (0.001) (0.003) (0.003) (0.001)   (0.001) (0.003) (0.003) (0.003)   Poverty 0.979 (0.003) (0.003) (0.003)   Poverty 0.119 (0.003) (0.003) (0.003)   Special Education 0.119 (0.003) (0.003) (0.003)   (0.001) (0.001) (0.003) (0.003) (0.003)   figilah Learner 0.46 (0.001) (0.003) (0.003)   College 0.54 (0.000) (0.002) (0.004) (0.002)   Elisck 0.44 (0.001) (0.001) (0.013) (0.002)   Hispanic 0.908 -6.002 (0.004) (0.005) 0.001 <td< td=""><td></td><td></td><td>[.275]</td><td>[.282]</td><td>[.395]</td><td>[.058]</td></td<>			[.275]	[.282]	[.395]	[.058]
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Female	0.487	0.002	-0.002*	0.005	-0.001
			(0.001)	(0.001)	(0.004)	(0.002)
Migrant 0.082 0.000 0.02** -0.001 0.000   (0.001) (0.003) (0.001) (0.003) (0.001)   Poverly 0.079 0.001 0.005** 0.005 (1.43)   Poverly 0.079 0.001 0.005** 0.005 0.002   Special Education 0.19 0.03*** 0.001 0.003 -0.001   Special Education 0.19 0.003*** 0.001 0.003 -0.001   (0.001) (0.001) (0.007) (0.003) -0.001   (0.001) (0.001) (0.007) -0.001   (0.003) (0.001) (0.003) -0.001   (0.003) (0.003) (0.003) (0.003)   (131] [192] [144] [345]   2016ge 0.054 0.000 -0.001 -0.001   (1477) [1023] [383] [425]   2016ge 0.044 0.006 -0.001   (1002) (0.003) (0.002) 0.006<			[.205]	[.085]	[.188]	[.263]
$\begin{tabular}{ c c c c } & (0.00) & (0.00) & (0.00) & (0.00) \\ & [393] & [055] & [343] & [443] \\ [390] & [005] & [0.005] & 0.002 \\ & (0.002) & (0.003) & (0.005) & 0.002 \\ & (0.002) & (0.003) & (0.003) & (0.003) \\ & [30] & [10] & [233] & [32] \\ & [30] & [10] & [233] & [32] \\ & [30] & [10] & [233] & [32] \\ & [30] & [10] & [233] & [32] \\ & [30] & [10] & [233] & [32] \\ & [30] & [10] & [233] & [32] \\ & [30] & [30] & [30] & (0.00) & (0.003) \\ & [30] & [10] & [10] & [10] & (0.003) & (0.003) \\ & [30] & [10] & [10] & [10] & [30] & [30] \\ & [30] & [30] & [30] & [30] & [30] \\ & [30] & [30] & [30] & [30] & [30] & [30] \\ & [30] & [30] & [30] & [30] & [30] & [30] \\ & [30] & [30] & [30] & [30] & [30] & [30] & [30] \\ & [30] & [30] & [30] & [30] & [30] & [30] & [30] \\ & [30] & [30] & [30] & [30] & [30] & [30] & [30] & [30] \\ & [30] & [30] & [30] & [30] & [30] & [30] & [30] & [30] \\ & [30] & [30] & [30] & [30] & [30] & [30] & [30] & [30] & [30] & [30] \\ & [30] $	Vigrant	0.082	0.000	0.002**	-0.001	0.000
20xerty 0.979 [.003] [.043] [.443]   20xerty 0.979 0.001 0.005** 0.003 0.002   [.36] [.01] [.288] [.34] [.34]   Special Education 0.19 0.003*** 0.001 0.003 0.003   Special Education 0.19 0.003*** 0.001 0.003 0.003   103] [.19] [.233] [.12] [.103] [.19] [.233] [.23]   English Learner 0.16 0.001 0.002 -0.009 -0.001   [.003] [.003] [.003] [.003] [.003] [.003] [.003]   College 0.054 0.000 -0.03** 0.001 -0.001   [.318] [.102] [.145] [.395]   Elack 0.064 0.000 -0.001 -0.011 -0.002   [.400] (.0001) (.0003) [.0002] [.004] 0.005 0.001   [.415] [.395] [.21]			(0.001)	(0.001)	(0.003)	( 0.001)
Poverty 0.979 0.001 0.006** 0.005 0.002   (0.002) (0.003) (0.003) (0.003) (0.003)   Special Education 0.119 0.003** 0.001 0.003 (0.002)   Special Education 0.119 0.003** 0.001 0.003 (0.002)   English Learner 0.146 0.001 0.002 -0.001   English Learner 0.146 0.001 (0.007) (0.003)   English Learner 0.146 0.000 0.001 (0.007) (0.003)   College 0.054 0.000 -0.001 (0.003) (0.002)   College 0.054 0.000 -0.001 -0.011 -0.002   Slack 0.044 0.000 -0.001 -0.011 -0.002   Isspanic 0.908 -0.002 0.004 0.006 0.001   (0.002) (0.003) (0.003) (0.005) (0.005)   Hisspanic 0.908 -0.002 0.004 0.006 <			[.393]	[.055]	[.343]	[.443]
(0.002) (0.003) (0.003) (0.003)   japcial Education 0.119 0.003**** 0.001 0.003 -0.001   (0.001) (0.003) (0.003) (0.003) -0.001   (0.001) (0.003) (0.003) (0.003) -0.001   (0.001) (0.003) (0.003) (0.003) (0.003)   inglish Learner 0.146 0.001 0.002 -0.009 -0.001   (0.003) (0.003) (0.003) (0.003) (0.003) (0.003)   20lege 0.054 0.000 -0.003* 0.001 -0.011   (0.001) (0.003) (0.001) -0.001 -0.012   (0.002) (0.001) -0.011 -0.022   (147) [102] [138] [142]   (147) [102] [102] [134]   (147) [102] [102] [134]   (148) [102] [132] [143]   (148) [102] [132] [143]	Poverty	0.979	0.001	0.006**	0.005	0.002
[36] [01] [288] [34]   Special Education 0.119 0.003*** 0.001 0.003 -0.001   [0001] (0.001) (0.003) (0.002) -0.001 (0.002)   English Learner 0.146 (0.001) 0.002 -0.007 (0.003)   English Learner 0.146 (0.003) (0.0001) (0.007) (0.003)   College 0.146 (0.000) -0.001 -0.001 -0.001   College 0.054 (0.000) (0.002) (0.004) (0.002)   Black 0.044 0.000 -0.001 -0.011 -0.002   Hispanic 0.908 -0.002 0.004 0.006 0.001   Hispanic 0.909 -0.002 0.004 0.005 0.001   Hispanic 0.909 0.001 -0.002* 0.004 0.005   Hispanic 0.090 0.001 0.005* 0.005 0.001   Hispanic 0.090 0.001 0.005*			(0.002)	(0.003)	(0.005)	(0.003)
Special Education 0.19 0.003*** 0.001 0.003 0.001   (0.001) (0.003) (0.002) (0.002) (0.002)   [013] [19] [233] [32]   English Learner 0.146 0.001 0.002 -0.009 -0.001   Cologa 0.003 (0.003) (0.007) (0.003) (0.003) (0.003) (0.003) (0.003) (0.003) (0.003) (0.003) (0.003) (0.003) (0.003) (0.003) (0.001) (0.002) (0.004) (0.002) (0.004) (0.002) (0.002) (0.003)<			[.36]	[.01]	[.288]	[.34]
(0.001) (0.003) (0.003) (0.003)   inglish Learner 0.146 0.001 0.002 -0.009 -0.001   (0.003) (0.001) (0.007) (0.003) (0.003)   (1.138] [132] [134] [395]   College 0.054 0.000 -0.033** 0.001 -0.001   (0.001) (0.003) (0.001) (0.002) (0.004) (0.002)   138ck 0.044 0.000 -0.001 -0.001 -0.001   (1.002) (0.003) (0.001) (0.013) (0.002)   14spanic 0.908 -0.002 0.004 0.006 0.001   (0.002) (0.003) (0.007) (0.003) (0.007)   4tispanic 0.908 -0.002 0.004 0.006 0.001   (195] [102] [132] [1438] [1438] [1438]   4tispanic 0.908 -0.002 0.004 0.006 0.001   (0.002) (0.003) (0.	Special Education	0.119	0.003***	0.001	0.003	-0.001
Install [19] [23] [22]   English Learner 0.146 0.001 0.002 -0.009 -0.001   [0.03] (0.001) (0.007) (0.033)   [0.03] [0.001] (0.007) (0.033)   [218] [102] [148] [395]   College 0.054 (0.000) -0.002 (0.004) (0.002)   Jack 0.044 (0.000) -0.001 -0.011 -0.002   Jasak 0.044 (0.002) (0.001) (0.002) (1.011) (0.002)   Hispanic 0.908 -0.002 0.004 0.006 0.001   Hispanic 0.909 -0.002 (0.003) (0.015) (1.025)   Hispanic 0.909 -0.002 0.004 0.005 0.005   Hispanic 0.091 0.0023 (0.003) (0.015) [195] [102] [323] [438]			(0.001)	(0.001)	(0.003)	(0.002)
English Learner 0.146 0.001 0.002 -0.009 -0.001   (0.003) (0.007) (0.003) (0.003) (0.003) (0.003)   [318] [102] [145] [395]   College 0.054 0.001 -0.003** 0.001 -0.001   (0.001) (0.001) (0.002) (0.004) (0.002)   Black 0.044 0.000 -0.001 -0.001 -0.001   (1992) [27] [263] [34] [425]   Hispanic 0.908 -0.002 0.004 0.005 0.001   (1002) (0.003) [0.003] [0.003] [0.003] [0.003]   (199] [27] [263] [34] [34] [34]   (1002) (0.003) [0.003] [0.003] [0.003] [0.003]   (1002) [0.003] [0.003] [0.003] [0.003] [0.002]			[.013]	[.19]	[.233]	[.32]
(0.003) (0.007) (0.003)   [318] [102] [145] [395]   College 0.054 0.000 -0.03** 0.001 -0.01   (0.001) (0.002) (0.004) 0.001 -0.01   [477] [0.23] [383] [4/25]   Black 0.044 0.000 -0.01 -0.01 -0.002   [199] [21] [263] [34]   Hispanic 0.908 -0.002 0.004 0.006 0.001   [199] [21] [263] [143]   Hispanic 0.908 -0.002 0.004 0.006 0.001   (0.002) (0.003) (0.011) (0.003) (0.005)   (199] [102] [323] [438]   White 0.019 0.002* 0.004 0.004 0.005	English Learner	0.146	0.001	0.002	-0.009	-0.001
Latel [102] [144] [395]   College 0.054 0.000 -0.002** 0.001 -0.001   L0001 (0.000) 0.0022 (0.004) (0.002)   L477 [1023] [383] [425]   Black 0.004 (0.000) -0.001 -0.002   (0.002) (0.001) -0.011 -0.002   [asps] [21] [263] [134]   Hispanic 0.908 -0.002 0.004 0.005 0.001   (1002) (0.003) (0.011) (0.005) (0.005)   (195] [102] [323] [438]   White 0.019 0.007 0.002* 0.044 0.000			(0.003)	(0.001)	(0.007)	(0.003)
College 0.054 0.000 -0.03** 0.001 -0.001   (0.001) (0.002) (0.004) (0.002)   [477] [1023] [1343] [1425]   Jlack 0.004 0.000 -0.001 -0.01   (0.002) (0.001) (0.003) (0.003)   (1395] [17] [1263] [134]   4ispanic 0.908 -0.002 0.004 0.006 0.007   (1002) (0.003) (0.007) (0.005) (0.005) (0.005)   (195] [102] [323] [438]   white 0.019 -0.002* 0.004 0.006   (0.001) -0.002* 0.004 0.000 0.000			[.318]	[.102]	[.145]	[.395]
(0.001) (0.002) (0.004) (0.002)   [477] [023] [383] [425]   Black 0.044 0.000 -0.011 -0.002   (0.002) (0.001) (0.011) (0.002)   Hispanic 0.908 -0.002 0.004 0.006 0.011   Hispanic 0.908 -0.002 0.004 0.006 0.001   Hispanic 0.908 -0.002 0.004 0.005 0.001   (0.002) (0.003) (0.007) (0.005) (0.005) (0.005)   (175] [172] [323] [438] [438]   White 0.019 0.001 -0.002* 0.004 0.000	College	0.054	0.000	-0.003**	0.001	-0.001
[477] [023] [383] [425]   Black 0.044 0.000 -0.001 -0.011 -0.002   (0002) (0.001) (0.003) (0.011) (0.003)   Hispanic 0.908 -0.002 0.004 0.006 0.001   (0002) (0.004) 0.006 0.001 (0.005)   (195] [102] [323] [438]   White 0.019 0.001 -0.002* 0.004   (0.001) 0.002* 0.004 0.000 0.000			(0.001)	(0.002)	(0.004)	(0.002)
Black 0.04 0.000 -0.001 -0.011 -0.002 (0.002) (0.001) (0.01) (0.003) Hispanic 0.908 -0.002 0.004 0.006 0.001 (0.002) (0.003) (0.011) (0.005) (1.95] [102] [323] [438] hite 0.019 0.001 -0.002* 0.004 0.000			[.477]	[.023]	[.383]	[.425]
(0.002) (0.001) (0.011) (0.003)   [39] [21] [263] [34]   Hispanic 0.908 -0.002 0.004 0.006 0.001   (0.002) (0.003) (0.011) (0.003)   (195] [102] [323] [438]   White 0.019 0.002* 0.004 0.002	Black	0.044	0.000	-0.001	-0.011	-0.002
Hispanic 0.908 -0.002 0.004 0.006 0.001 (1.915) [21] [263] [34] (0.002) 0.004 0.006 0.001 (0.002) (0.003) (0.011) (0.005) [195] [102] [323] [438] (0.001) -0.002* 0.004 0.000 (0.001) (0.003) (0.002)			(0.002)	(0.001)	(0.011)	(0.003)
Hispanic 0.908 -0.002 0.004 0.006 0.001 (0.002) (0.003) (0.011) (0.005) [195] [102] [1323] [438] White 0.019 0.001 -0.002* 0.004 0.000 (0.001) (0.003) (0.002)			[.395]	[.21]	[.263]	[.34]
(0.002) (0.003) (0.011) (0.005)   [195] [102] [323] [438]   White 0.019 0.001 -0.002* 0.004 0.000   (0.001) (0.003) (0.002) (0.002) (0.002)	Hispanic	0.908	-0.002	0.004	0.006	0.001
[195] [102] [323] [438] White 0.019 0.001 -0.002* 0.004 0.000 (0.001) (0.003) (0.002)			(0.002)	(0.003)	(0.011)	(0.005)
White 0.019 0.001 -0.002* 0.004 0.000 (0.001) (0.001) (0.003) (0.002)			[.195]	[.102]	[.323]	[.438]
(0.001) (0.003) (0.002)	White	0.019	0.001	-0.002*	0.004	0.000
			(0.001)	(0.001)	(0.003)	(0.002)

17/29

Design

Data

Motivating Evidence

Survey Evidence

e Choice Evidence of

Evidence of Strategic Behavior

#### Impacts on AG (with Randomization Inference)



#### Impacts on AG (with Randomization Inference)



### Impacts on AG (with Randomization Inference)



- - - Low Saturation Treatment

Reduced Form Evidence

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

#### Impacts on AG (with Randomization Inference)



---- Low Saturation Spillover

lation Reduced Form Evidence

Survey Evidence

e Discrete Choi

Evidence of Strategic Behavior

#### Impacts on IA (with Randomization Inference)



Reduced Form Evidence

Evidence of Strategic Behavior

### Impacts on IA (with Randomization Inference)



Effect on Top-Ranked School Incoming Achievement (percentile rank)

Motivating Evidence

Data

Design



Reduced Form Evidence

000000

- - Low Saturation Treatment

Evidence of Strategic Behavior

Motivating Evidence

Data

Design



Reduced Form Evidence

000000

Low Saturation Spillover -----

Evidence of Strategic Behavior



Effects on CDF of Achievement Growth

— AG



Effects on CDF of Achievement Growth

— IA



Effects on CDF of Achievement Growth

IA and AG



Effects on CDF of Achievement Growth

Spillover



Effects on CDF of Incoming Achievement

—— AG



Effects on CDF of Incoming Achievement

IA



Effects on CDF of Incoming Achievement

IA and AG



Effects on CDF of Incoming Achievement



	(1)	(2)	(3)	(4)	(5)
	~ ~ ~	Low Sa	turation	High Sa	turation
	Control Mean	2019	2021	2019	2021
	Pi	anel A: Scho	ol Experien	ce Survey	
Happiness Index	0.048	-0.038	-0.006	0.028	0.072**
		(0.027)	(0.030)	(0.027)	(0.028)
		[0.117]	[0.445]	[0.223]	[0.028]
Interpersonal Skills Index	0.030	-0.060**	-0.004	-0.019	0.056**
		(0.024)	(0.021)	(0.026)	(0.028)
		[0.035]	[0.412]	[0.248]	[0.055]
School Connectedness Index	0.514	-0.014	0.000	0.004	0.039**
		(0.015)	(0.017)	( 0.015)	(0.016)
		[0.213]	[ 0.477]	[0.423]	[0.025]
Academic Effort Index	0.053	-0.048	-0.006	-0.002	0.046**
		(0.031)	(0.029)	(0.022)	(0.022)
		[0.068]	[ 0.393]	[0.453]	[0.085]
Bullying Index	0.175	0.048	0.029	0.099***	0.094***
		(0.033)	(0.026)	(0.036)	(0.028)
		[0.148]	[0.228]	[0.020]	[ 0.010]
Observations			23	3792	
	Da	nol R: Elovor	ath Grade T	aet Scores	
		ner b. Liever	itir orade i	eat ocorea	
Math Score	-0.020	-0.039	-	-0.031	-
		(0.037)	-	(0.040)	-
ELA Score	0.069	-0.007	-	-0.001	-
		( 0.036)	-	(0.036)	-
Observations			16	145	

	(1)	(2)	(3)	(4)	(5)
		Low Sa	turation	High Sa	turation
	Control Mean	2019	2021	2019	2021
	Pi	anel A: Scho	ol Experien	ce Survey	
Happiness Index	0.048	-0.038	-0.006	0.028	0.072**
		(0.027)	(0.030)	(0.027)	(0.028
		[0.117]	[0.445]	[0.223]	[0.028]
Interpersonal Skills Index	0.030	-0.060**	-0.004	-0.019	0.056**
		(0.024)	(0.021)	(0.026)	(0.028)
		[0.035]	[0.412]	[0.248]	[0.055]
School Connectedness Index	0.514	-0.014	0.000	0.004	0.039**
		(0.015)	(0.017)	(0.015)	( 0.016)
		[0.213]	[0.477]	[0.423]	[0.025
Academic Effort Index	0.053	-0.048	-0.006	-0.002	0.046*
		(0.031)	(0.029)	(0.022)	(0.022
		[0.068]	[0.393]	[0.453]	[0.085
Bullying Index	0.175	0.048	0.029	0.099***	0.094**
	$\square$	(0.033)	(0.026)	(0.036)	(0.028)
		[0.148]	[0.228]	[0.020]	[ 0.010
Observations			23	792	
	Pa	nel B: Elever	nth Grade T	est Scores	
Math Score	-0.020	-0.039		-0.031	-
man obore	0.020	(0.037)	-	(0.040)	-
ELA Score	0.069	-0.007	-	-0.001	-
		( 0.036)	-	(0.036)	-
Observations			16	145	

	(1)	(2)	(3)	(4)	(5)
		Low Sa	turation	High Sa	turation
	Control Mean	2019	2021	2019	2021
	Pa	anel A: Scho	ol Experien	ce Survey	
Happiness Index	0.048	-0.038	-0.006	0.028	0.072**
		( 0.027) [ 0.117]	( 0.030) [ 0.445]	( 0.027) [ 0.223]	( 0.028) [ 0.028]
Interpersonal Skills Index	0.030	-0.060** (0.024)	-0.004 ( 0.021)	-0.019 (0.026)	0.056**
School Connectedness Index	0.514	[ 0.035] -0.014 ( 0.015)	[ 0.412] 0.000 ( 0.017)	[ 0.248] 0.004 ( 0.015)	[ 0.055] 0.039** ( 0.016)
Academic Effort Index	0.053	[0.213] -0.048	[0.477]	[0.423]	[0.025] 0.046**
Bullving Index	0.175	( 0.031) [ 0.068] 0.048	( 0.029) [ 0.393] 0.029	(0.022) [0.453] 0.099***	(0.022) [0.085] 0.094***
		( 0.033) [ 0.148]	( 0.026) [ 0.228]	( 0.036) [ 0.020]	( 0.028) [ 0.010]
Observations			23	792	
	Pa	nel B: Elever	nth Grade Te	est Scores	
Math Score	-0.020	-0.039	-	-0.031	-
ELA Score	0.069	(0.037)	-	(0.040)	-
		( 0.036)	-	( 0.036)	-
Observations			16	145	

	(1)	(2)	(3)	(4)	(5)
		Low Sa	turation	High Sa	turation
	Control Mean	2019	2021	2019	2021
	P	anal A: Soho	ol Evnerien	co Suprey	
		iner A. Sono	or experien	ce survey	
Happiness Index	0.048	-0.038	-0.006	0.028	0.072**
		(0.027)	(0.030)	(0.027)	(0.028)
		[0.117]	[0.445]	[0.223]	[0.028]
Interpersonal Skills Index	0.030	-0.060**	-0.004	-0.019	0.056**
		(0.024)	(0.021)	(0.026)	(0.028)
		[ 0.035]	[0.412]	[0.248]	[0.055]
School Connectedness Index	0.514	-0.014	0.000	0.004	0.039**
		(0.015)	(0.017)	(0.015)	(0.016)
		[ 0.213]	[0.477]	[0.423]	[0.025]
Academic Effort Index	0.053	-0.048	-0.006	-0.002	0.046**
		(0.031)	(0.029)	(0.022)	(0.022)
		[0.068]	[0.393]	[0.453]	[0.085]
Bullying Index	0.175	0.048	0.029	0.099***	0.094***
		(0.033)	(0.026)	(0.036)	(0.028)
		[ 0.148]	[0.228]	[ 0.020]	[0.010]
Observations			23	792	
		10.5			
	Pa	nel B: Elever	nth Grade I	est Scores	
Math Score	-0.020	-0.039	-	-0.031	
		(0.037)	-	(0.040)	-
ELA Score	0.069	-0.007	-	-0.001	-
		(0.036)	-	( 0.036)	-
Observations			16	145	

	(1)	(2)	(3)	(4)	(5)
		Low Sa	turation	High Sa	ituration
	Control Mean	2019	2021	2019	2021
	P	anel A: Scho	ol Experien	ce Survey	
Happiness Index	0.048	-0.038	-0.006	0.028	0.072**
		(0.027)	(0.030) [0.445]	(0.027) [0.223]	(0.028) [0.028]
Interpersonal Skills Index	0.030	-0.060**	-0.004	-0.019	0.056**
		(0.024) [0.035]	(0.021)	(0.026) [0.248]	( 0.028) [ 0.055]
School Connectedness Index	0.514	-0.014 ( 0.015)	0.000 ( 0.017)	0.004 ( 0.015)	0.039** ( 0.016)
Academic Effort Index	0.053	[0.213] -0.048	[ 0.477] -0.006	[0.423] -0.002	[ 0.025] 0.046**
		( 0.031) [ 0.068]	( 0.029) [ 0.393]	( 0.022) [ 0.453]	( 0.022) [ 0.085]
Bullying Index	0.175	0.048 ( 0.033)	0.029 ( 0.026)	0.099*** ( 0.036)	0.094*** ( 0.028)
		[ 0.148]	[ 0.228]	[0.020]	[ 0.010]
Observations			23	3792	
	Pa	inel B: Elever	nth Grade T	est Scores	
Math Score	-0.020	-0.039	-	-0.031	) -
ELA Score	0.069	(0.037) -0.007	-	(0.040) -0.001	-
		( 0.036)	-	(0.036)	J -
Observations			16	145	

#### Biases are choice relevant





0

Discrete Choice

Evidence of Strategic Behavior

#### **Pessimism Correlates**

	IA Pes	ssimism	AG Pe	ssimism
	(1) Bivariate	(2) Multivariate	(3) Bivariate	(4) Multivariate
	Divariate	TYPE I LIVE I LIVE	Divariate	watervariat
Parents College +	1 085 ***	0.627 ***	-0.009	0.126
r arenno oonege	(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	3	.07	3	3.36

0

Reduced Form Evidence

Survey Evidence 0.00

Discrete Choice

Evidence of Strategic Behavior

#### Pessimism Correlates

(4) (2) (4)									
	(1)	(2)	(3)	(4)					
	Bivariate	Multivariate	Bivariate	Multivariate					
Devente College i	1.005 ***	0.607.###	0.000	0.106					
Parents College +	(0.170)	(0.107)	+0.009	0.126					
Linnania	(0.179)	(0.197)	(0.197)	(0.220)					
Hispanic	-0.883 ***	+0.243	(0.050)	(0.000)					
	(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					
2	(1.026)	(1.123)	(1.006)	(1.118)					
	(	((ab))	(	(					
Mean	-1	.63	-	0.52					
SD	з	.07	3	3.36					
	6	Go Back							

tion Reduced Form

Survey Evidence

Discrete Choi

Evidence of Strategic Behavior

# 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





Motivating Evidence O	Data 00000	Design O	Quality Definition and Validation	Reduced Form Evidence	Survey Evidence	Discrete Choice •O	Evidence of Strategic Behavior
Intuition							

There is an intermediate de-biasing step, with magnitude equal to the difference between gray and black bar







Design

0

Survey Evidence

Discrete Choice .

Evidence of Strategic Behavior

#### Intuition

#### Observed Effect = Salience Effect - Information Effect



Design

Data

Reduced Form Evider

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

#### Reduced Form Effects Implied by Structural Model

Quality Definition and Validation





Design Quality Do

Definition and Validation

Reduced Form Evidence

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

#### Many Applicants Face No Admission Risk

	Mean	SD	Share Zero	Share One
	(1)	(2)	(3)	(4)
Bell	.885	.318	0	.713
Belmont	.999	.001	0	.27
Boyle Heights	1	0	0	.673
Carson	.999	0	0	.26
Eastside	.876	.33	.124	.876
Fremont	.948	.221	.052	.948
Hawkins	.999	0	0	.463
Huntington Park	.999	0	0	.394
Jefferson	1	0	0	.854
Jordan	1	0	0	1
Narbonne	1	0	0	1
North East	1	0	0	1
North Valley	1	0	0	1
RFK	1	0	0	.68
South Gate	.971	.168	.029	.971
All Zones	.968	.176	.019	.734

Reduced Form Ev

Survey Evidence

oice Evidence of Strategic Behavior ○●

#### No Descriptive Evidence of Strategic Behavior

#### Share of Students Ranking School .8 .6 .4 .2 0 1 2 1 2 REX

**Before Intervention** 



Reduced Form Evic

Survey Evidence

ete Choice Eviden

#### No Descriptive Evidence of Strategic Behavior



2019


Reduced Form Ev

Survey Evidence

Discrete Choice

Evidence of Strategic Behavior

## No Descriptive Evidence of Strategic Behavior



2021

