Designing School Choice for Diversity in the San Francisco Unified School District

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Summary

The San Francisco Unified School District (SFUSD) passed a resolution in 2018 to redesign their elementary school student assignment system to promote predictability, proximity, and diversity. We developed an optimization and simulation engine to suggest and evaluate potential policies. Using this tool, we recommended a policy that was passed by the San Francisco Board of Education in December 2020 for a new policy starting 2023-24.

Background

- San Francisco has historical patterns of socio-economic and racial residential segregation
- Since 2002, SFUSD has used district-wide choice to help integrate schools, but choice has not reversed the trend of school resegregation.
- In 2018, Board Resolution 189-25A1: *Developing a Community Based Student Assignment System for SFUSD* initiated a redesign of the elementary school student assignment system
- **Goals: increase diversity, proximity, and predictability**

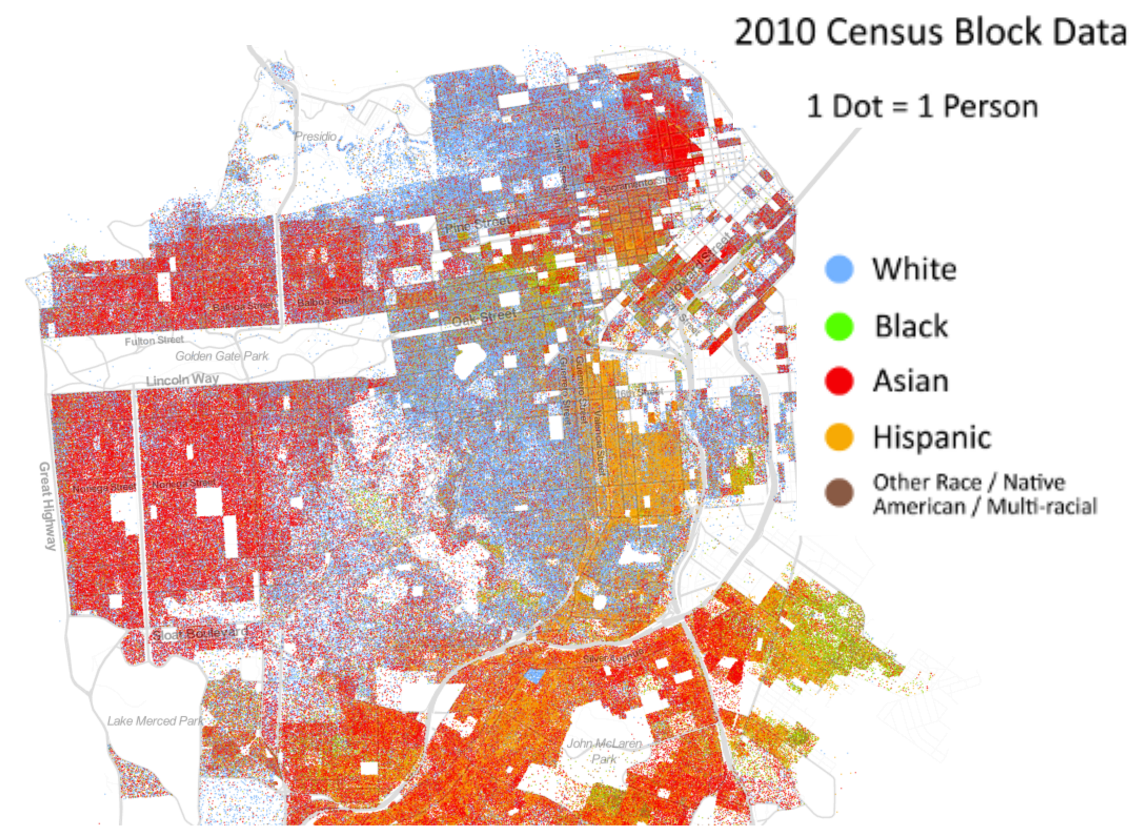

Figure 1: San Francisco residential segregation by Ethnicity

Standard School Choice Policy Design

- Typical school choice policy options include:
  - **Neighborhood Assignment** – Achieves proximity and predictability but not diversity or equity of access
  - **District-Wide Choice** *(current policy)* – Does not achieve predictability, proximity, diversity, or equity of access
- Tools explored in school choice literature:
  - Modifying school **priorities** – give disadvantaged students priority to any school [4,7]
  - Using diversity **quotas and reserves** – set aside seats for disadvantaged students [1,2,3,5,10]
  - **Restricting choice** – let families choose from a smaller menu of schools [6,7], assignment within zones (typically for districts without choice) [8,9]

Zone Optimization

- Zones can be used to restrict choice: students may choose only from schools in their zone
- SFUSD preferred zones to personalized menus

We developed a mixed-integer optimization problem to develop contiguous zones containing multiple schools.

- **Objective:** minimize shortage of seats in each zone
- **Constraints:**
  - Balance the size of every zone
  - Diversity measures within a pre-specified % of the district average
  - Limit zone size by bounding average distance across zone
  - Contiguity: each zone must be connected

Zones have traditionally been evaluated without choice. We incorporated choice in evaluating zones:

1. Find the Pareto Frontier of feasible zones with respect to diversity and distance constraints
2. Evaluate the performance of zones after simulating the choice process.

We found that choice can lead to resegregation of diverse zones, showing that it is important to **combine zone design with choice**.

Simulation

- We built an end-to-end simulation tool to test policies and evaluate resulting assignment
- Simulated student assignment using students from the 2018-19 Kindergarten application cycle
- **4 selected policies** illustrate tradeoffs: (1) 'Zones' (restricting choice with zones), (2) 'Zones+Reserves' (zones with soft quotas), (3) 'Priorities' (improved diversity priorities), (4) '2018-19 Assignment'

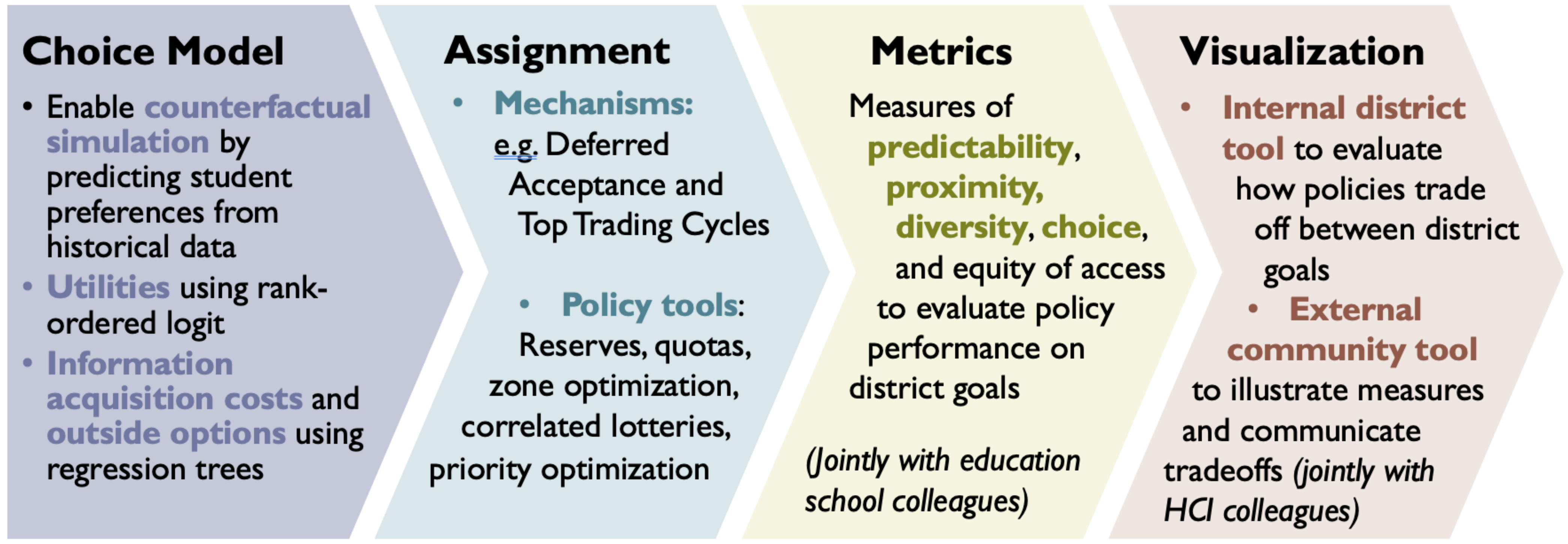

Figure 2: Workflow of simulation tool to evaluate policies

Tradeoffs and Proposed Policy

- Priorities can achieve diversity but not proximity or predictability
- Zones alone cannot achieve diversity, but with reserves they meet all 3 district goals

		Zones	Zones + Reserves	Priorities	2018-2019 Assignment
Proximity	Average Distance (miles)	1.37	1.32	1.75	1.39
	% Distance ≤ 0.5 miles	33%	34%	29%	34%
	% Distance ≥ 3 miles	12%	11%	21%	14%
Predictability	Unpredictable schools	2.7	5.3	7.5	15.2
Diversity	% Schools within ± 15% district FRL	65%	81%	79%	44%
	% AALPI in +15% FRL schools	22%	17%	12%	29%
	% AALPI in ethnically isolated schools	25%	27%	27%	31%
Choice	Rank Top 3	76%	67%	81%	80%
	Designated	22.7%	26.2%	18.0%	12.0%
	Unassigned	2.7%	2.3%	0.0%	1.9%

Proposed Policy: Restrict choice using geographic **zones with reserves**, improve outcomes for target populations (homeless, foster care) using **equity priorities**

Implementation and Next Steps

- Board passed policy in December 2020 and new policy will take effect for 2023-24 school year
- Next steps towards implementation:
  - Choosing specific zone plan with community input and further optimization
  - Choosing specific equity priorities
  - Visualization tool for community engagement and outreach

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