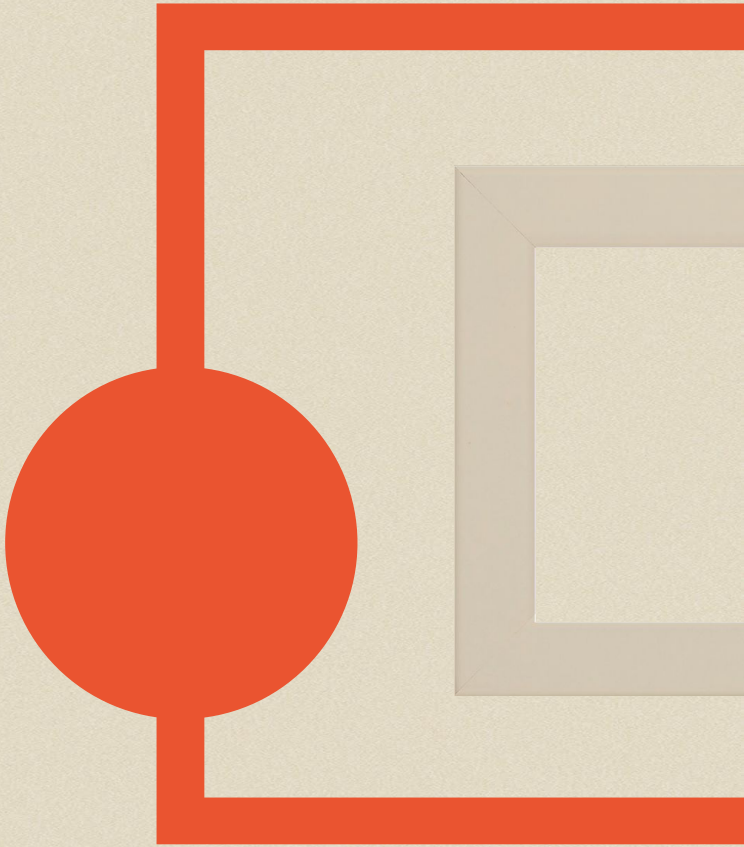
Income vs. Test Scores in California

Improvement initiatives and resource planning

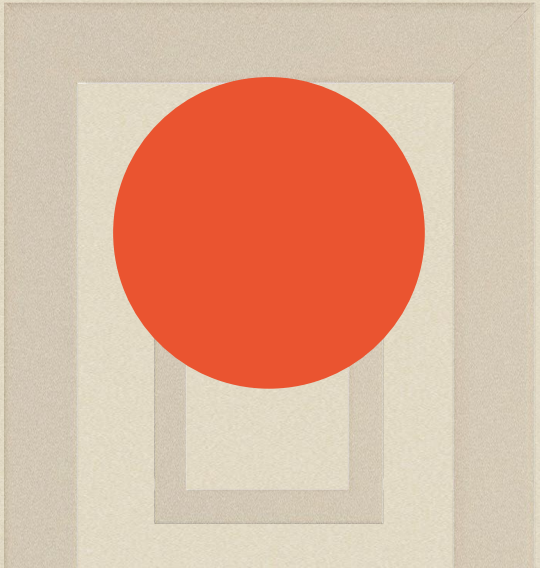


01

PROBLEM STATEMENT

02

METHODOLOGY



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DATA ANALYSIS

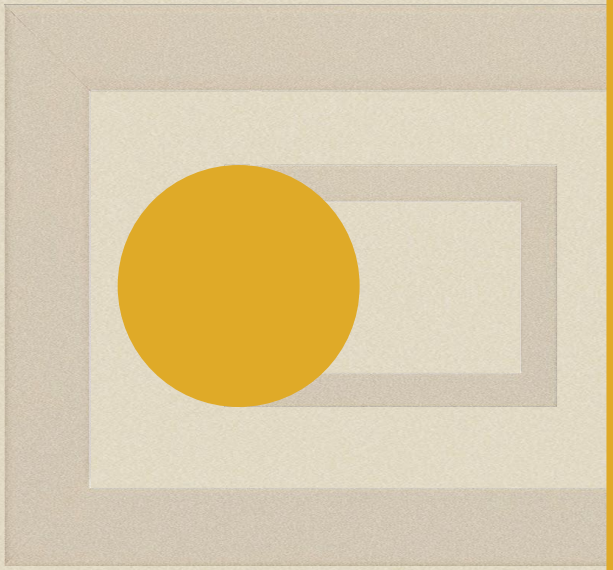
04

RECOMMENDATIONS

PROBLEM STATEMENT

There is an increasing education gap between the rich and poor.

Aim of project:
To help educational institutes and governments with resource and policy planning, to make education more accessible and equitable.



02

METHODOLOGY

Data sets, definitions and assumptions

DATA SETS

All 3 data sets were for the state of California, split by 58 counties respectively

ACT 2019

- Participation rate
- Average total score
- % of students scoring above benchmark of 21

SAT 2019

- Participation rate
- % of students meeting both benchmarks

Note: no raw score data was available

Income 2014

- Income per capita
- Median income per household

DATA CLEANING & ASSUMPTIONS

Out of the 58 states, 4 states were excluded.

Alpine County

There are no test takers, as this is the least populous county (1.6 people/sq mile)

Sierra, Plumas and Del Norte

These 3 counties had less than 15 test takers in total and the data was incomplete

Assumptions for Income Data

The income data obtained was for 2014

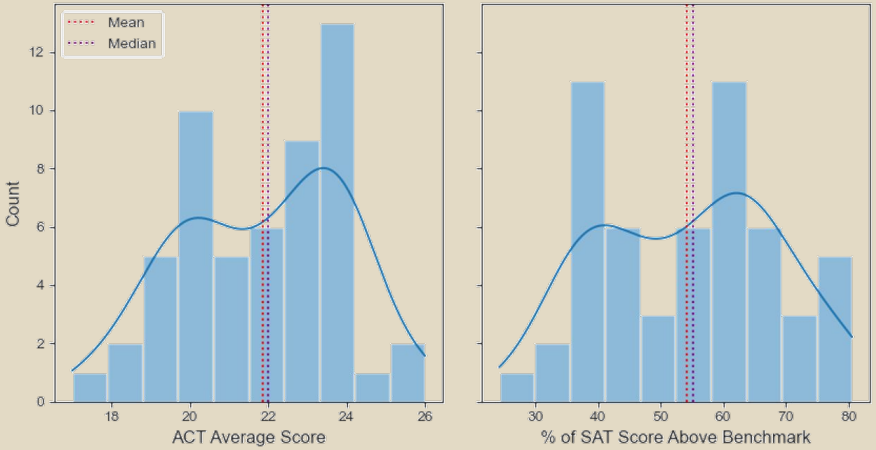
- Assume that income does not change drastically over 5 years
- Assume that the effects of family income is something that affects a student from young, and not only when a student takes their ACT/SAT

03

DATA ANALYSIS

Findings and implications

DISTRIBUTION OF TESTS



Bimodal

Indicative of 2 distinct types of students

- Hardworking vs lazy students?
- Low income vs higher income?
- Sparsely vs densely populated?

Unable to determine from histogram alone → will need to look at correlation

CORRELATION FINDINGS

Strong

- Students from higher income backgrounds tend to score better for ACT
- The higher the median household income, the higher participation rate is for SAT
- If a student scored well for the ACTs, they would most likely be above the benchmark scores for SATs

Moderate

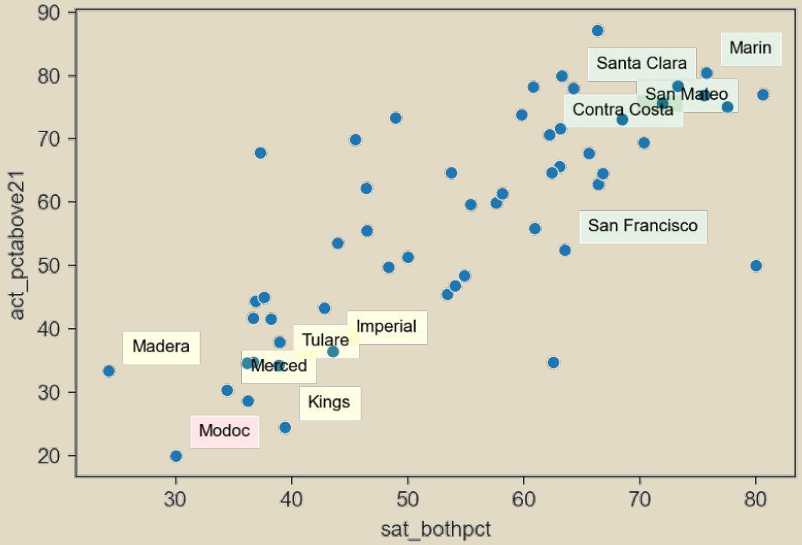
- Students from higher income backgrounds tend to score above the benchmarks for SAT and ACT
- Possible that there are other factors apart from income background that predicts scoring above the benchmarks

Weak

- Population is not a good predictor of test performance
- Population also does not predict higher income per capita

IMPLICATIONS

The previous 2 slides have established that income per capita has an impact on test performance.



Counties in green represent the top 5 income per capita counties.

- With the exception of San Francisco, they exhibit higher test performances

Counties in yellow represent the bottom 5 income per capita counties; and exhibit lower test performances

Modoc is above the 25th percentile for income but consistently exhibits one of the lowest test performances

Schools in the yellow and red counties would thus require more help in improving the quality and accessibility of education

04

RECOMMENDATIONS

Next steps and further improvements

CONCLUSIONS

1 RECOMMENDATIONS

To further look into specific schools or districts of the low income and low performing counties to identify what help students need

Immediate remedies could include: subsidies for test fees, and provision of material for lower income groups

Improvements to accessibility of education could also play a big part in today's environment, where online learning is rampant

- *Students from high income families have 50% more access to their teachers compared to low income families during Covid-19*[1]

NEXT STEPS 2

To determine if there are other factors affecting the relationship between income and test performance

- *"... effects of family income on SAT scores, though relatiively modest in contrasts to high school achievement, are substantial, non-linear, and nearly twice as large for Black students"*[2]

REFERENCES

1. Niu Gao, Julien Lafortune, and Laura Hill (Oct 2020). “Who Is Losing Ground with Distance Learning in California?”. Public Policy Institute of California
2. Ezekiel J. Dixon-Román, Howard T. Everson, John J. McArdle (May 2013). “Race, Poverty and SAT Scores: Modeling the Influences of Family Income on Black and White High School Students' SAT Performance”. Teachers’ College, Columbia University