



Pulling Back The Curtain

The True Influencers of SAT scores in NYC



Current Perception

- An SAT score is a proxy for wealth
- The SAT reflects systemic inequities
- The SAT perpetuates racial inequalities

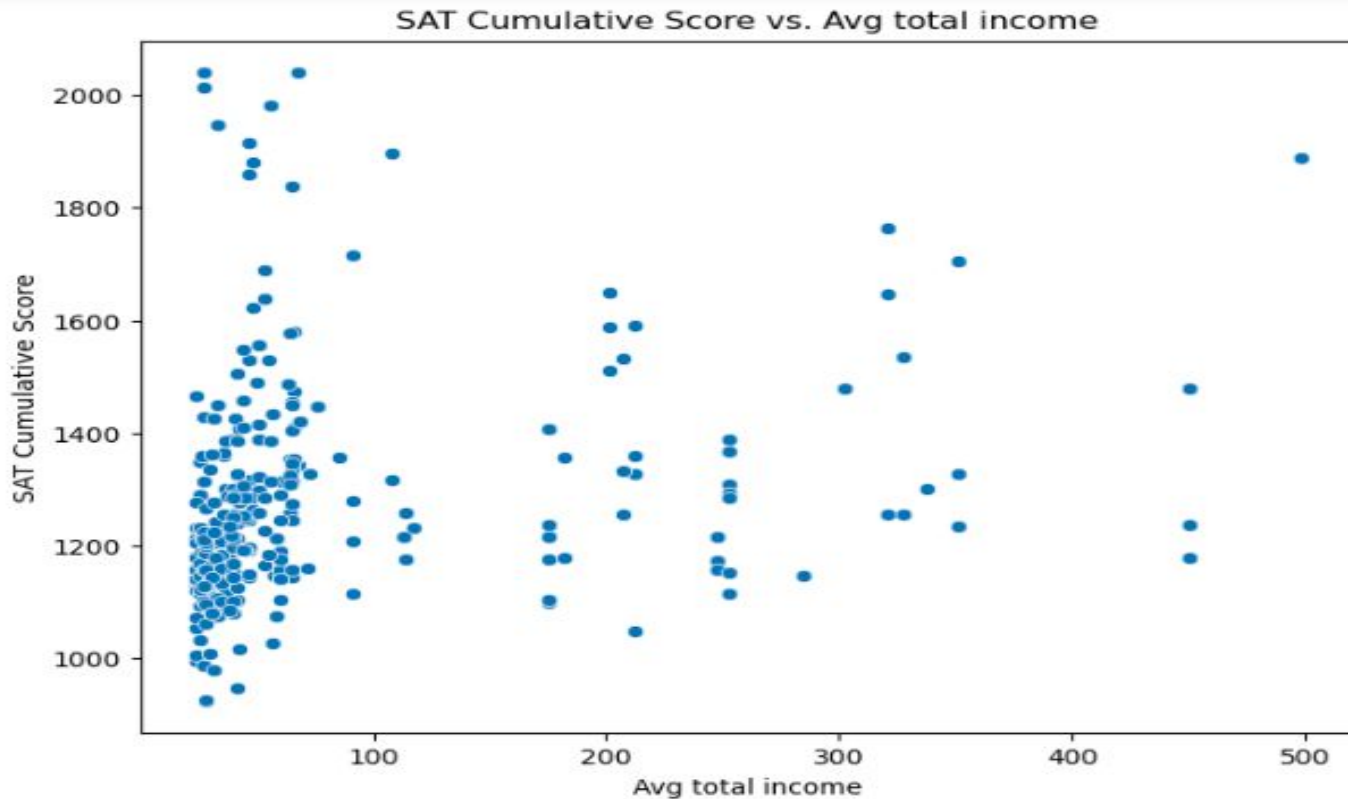
→ **To what extent do factors beyond a student's control determine SAT Score?**

Main Objective

**To provide college admissions boards with
data-driven insights around which factors
contribute to SAT scores**

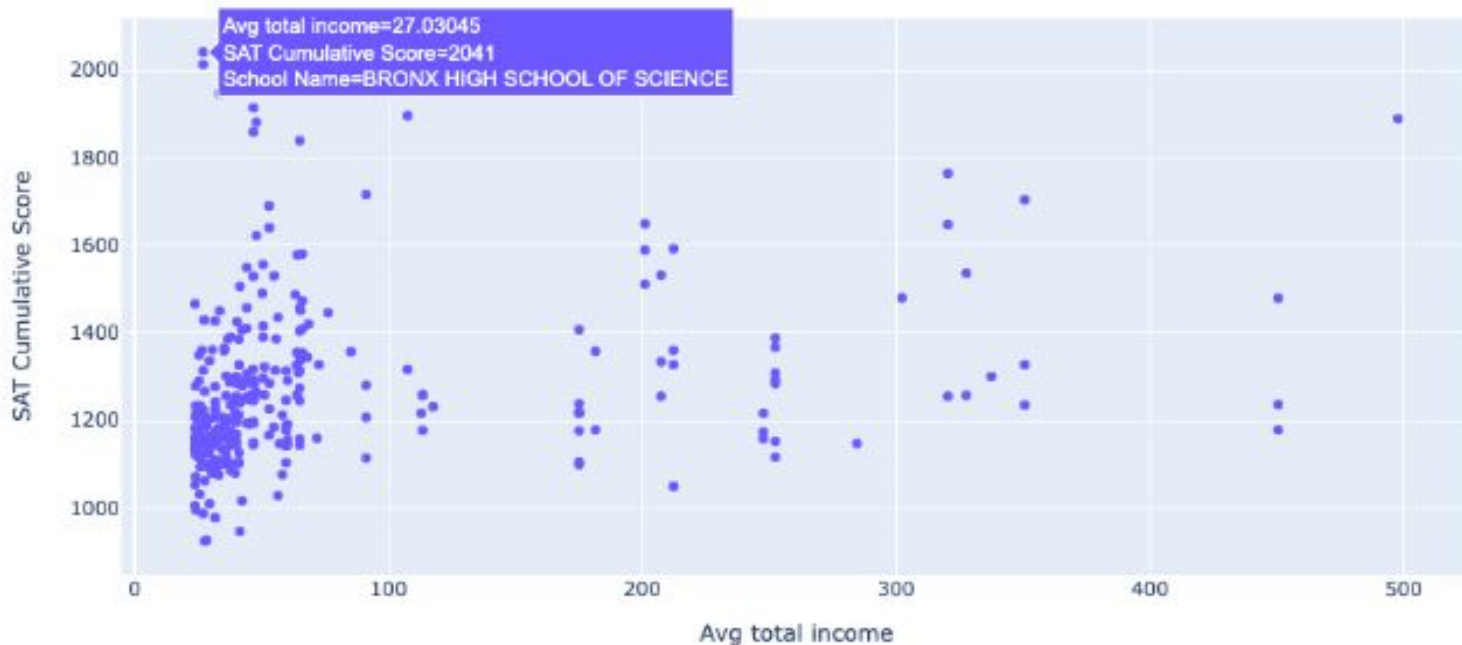


Wealth and SAT Scores

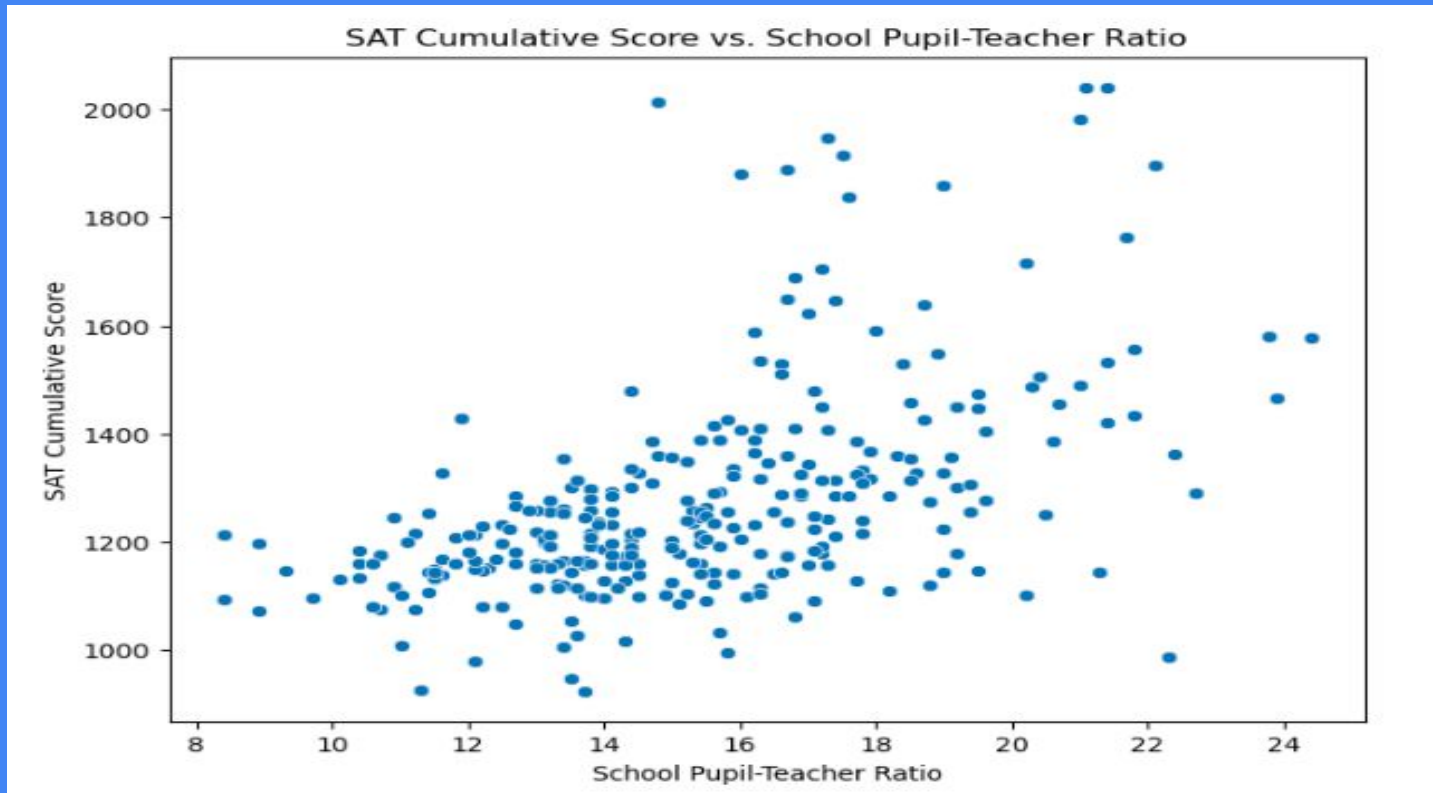


Wealth and SAT Scores

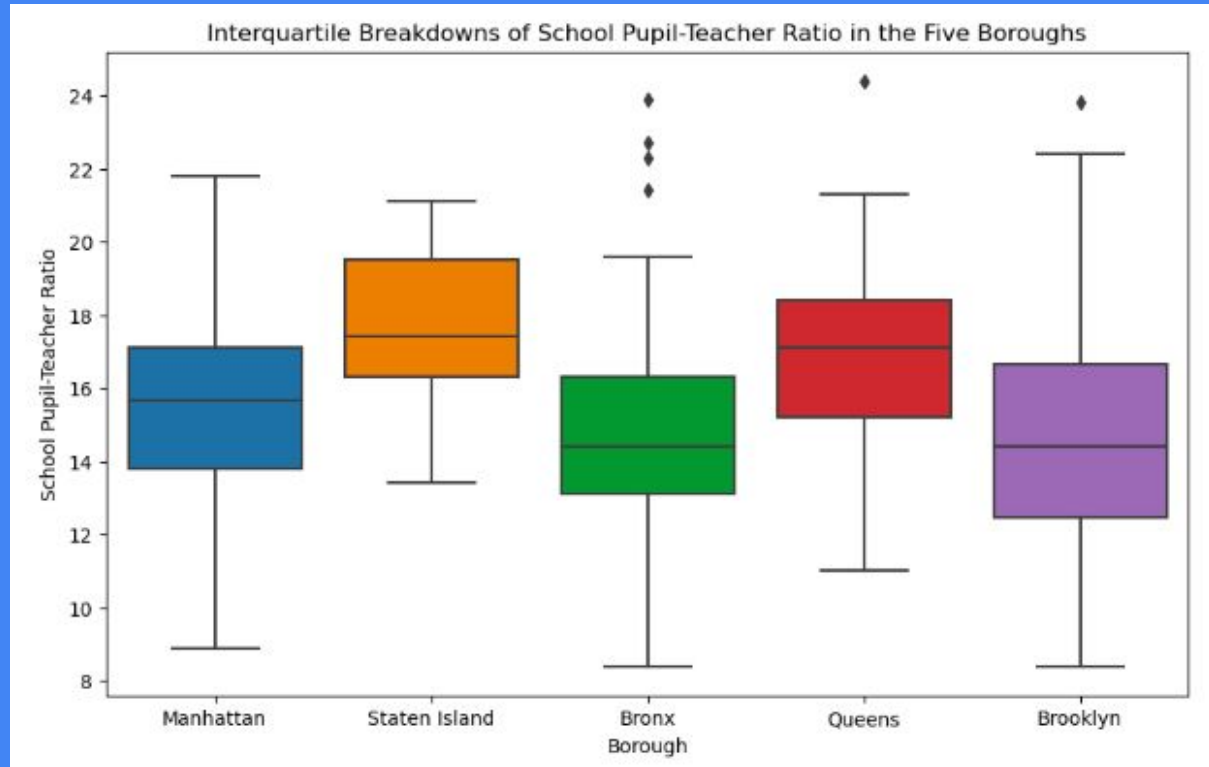
SAT Cumulative Score vs. Avg total income



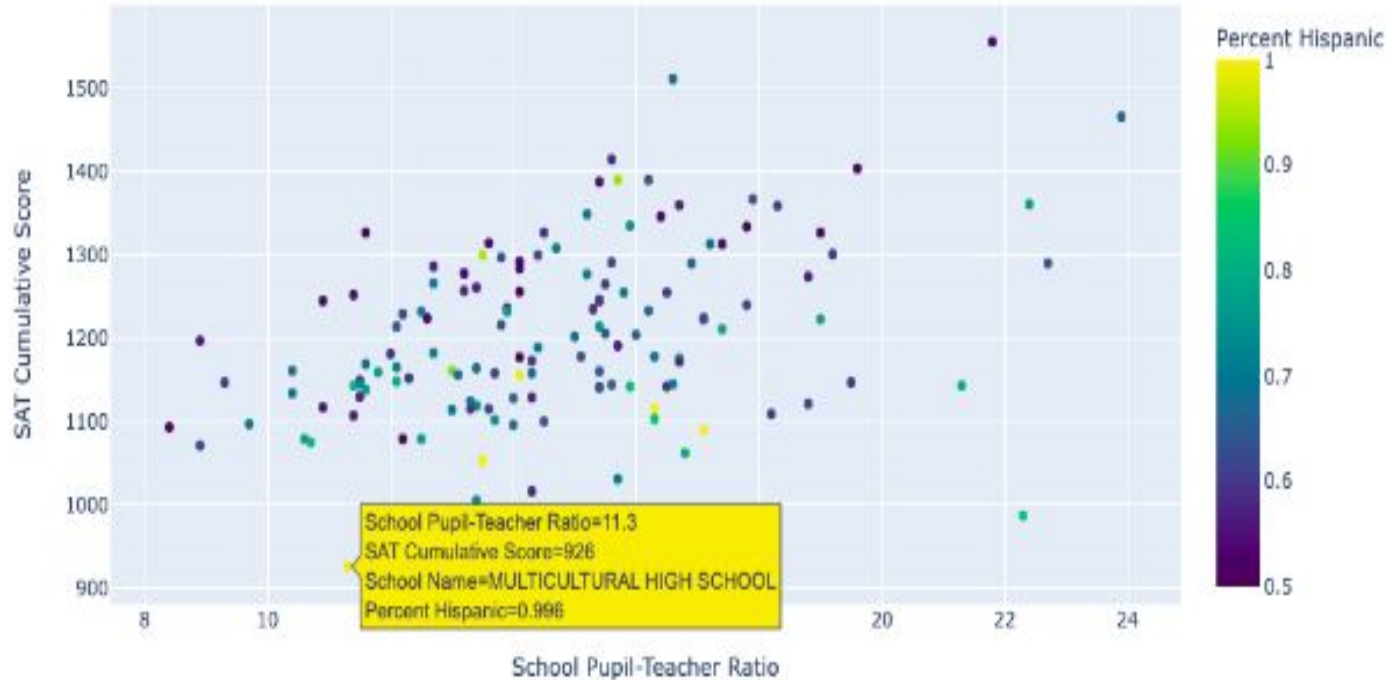
School Pupil-Teacher Ratio



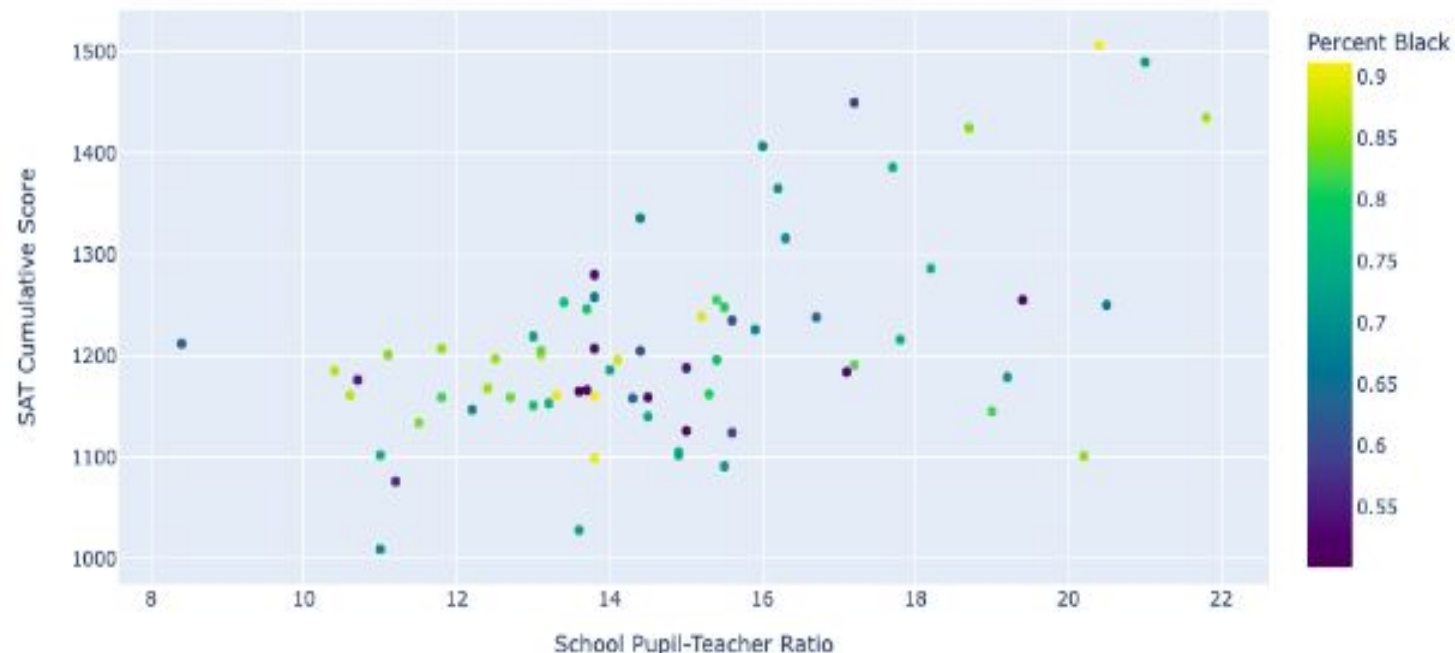
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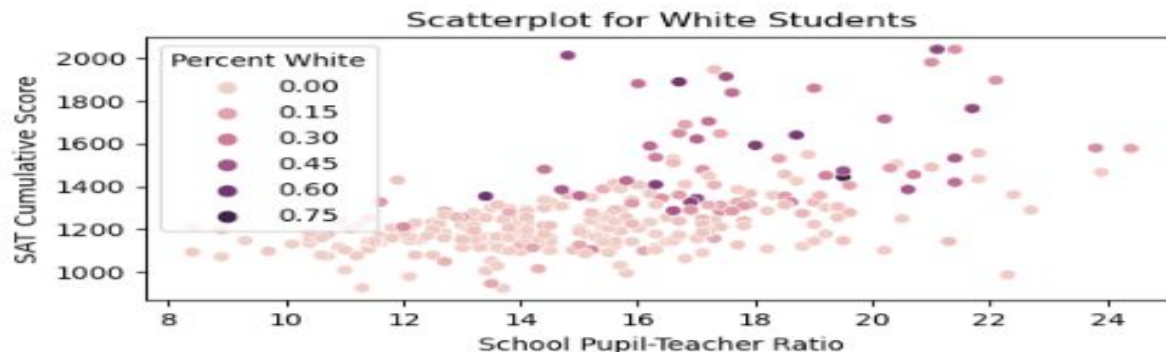
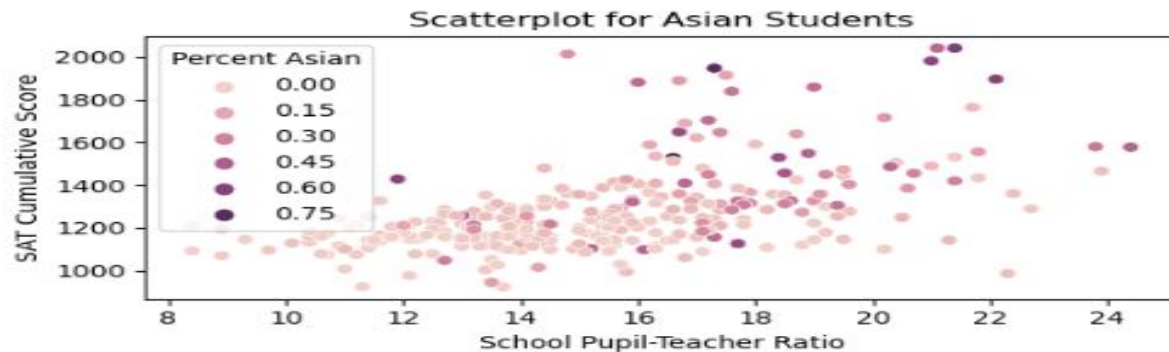
Race and SAT Scores



Race and SAT Scores



Race and SAT Scores



Race Segmentation in NYC

Black students: 34.77%

Hispanic students: 45.32%

Asian students: 10.81%

White students: 9.09%

Race Segmentation in NYC

Black students: 34.77%

Hispanic students: 45.32%

Asian students: 10.81%

White students: 9.09%

Black students: 3.7%

Hispanic students: 8.2%

Asian students: 61.4%

White students: 21.5%

Modeling

- The better the model:
 - The more SAT scores come down to external factors
 - The more likely systemic inequities

→ **To what extent do factors beyond a student's control determine SAT Score?**

Modeling

- Used multiple linear regression
 - Target variable: SAT Cumulative Score
- Included School Pupil-Teacher Ratio
- Used as many as seven different features

The Winner: School Pupil-Teacher Ratio and
Diversity Index

Modeling

- Used hyperparameter tuning, random forest, lasso and ridge regularization, cross-validation
- Most were susceptible to overfitting
 - K-nearest neighbors
 - Gradient boosting

Modeling

Winning Model: multiple linear regression with ridge regularization and cross-validation

- ❖ Accounts for 65% of variance



Concluding Thoughts

- Given the winning model, systemic inequities clearly exist
- These inequities likely happen “downstream” – the SAT is a reflection of them
- English languages learners (ELLs) are at a large disadvantage

Recommendations

- Look at students SAT percentile rank per school
- Look more closely at GPA for ELLs
- Take a student's unique history into account