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# **Analysis of Standardised Testing Scores for New York State Department of Education**

DSI-21 Project 1  
Table 3

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# Problem Statement

*“The Commissioner of the New York State Education Department would like to understand how the state fares in its education outcomes as measured by SAT/ACT scores against other states, and if it should change any policies to improve student outcomes.”*

# Methodology

## Hypothesis

- Students in New York state perform better in the SAT/ACT than other states as it is a high income state
- The state should increase education spending in order to improve its test scores further

## Approach

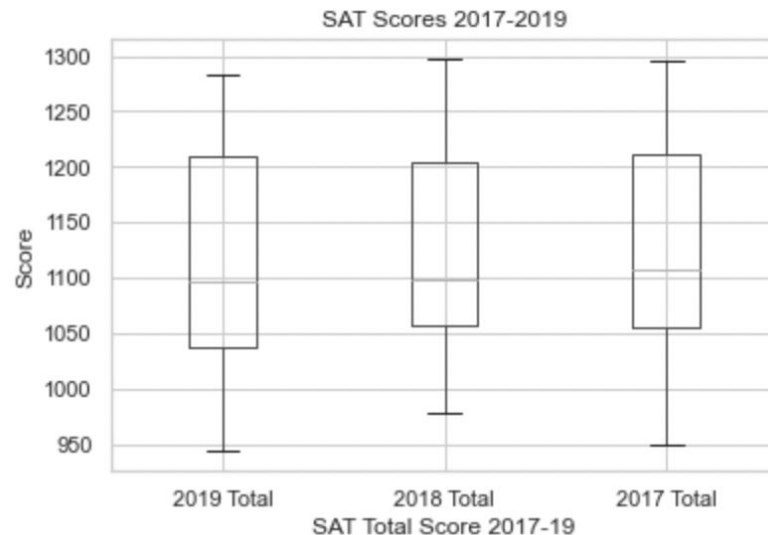
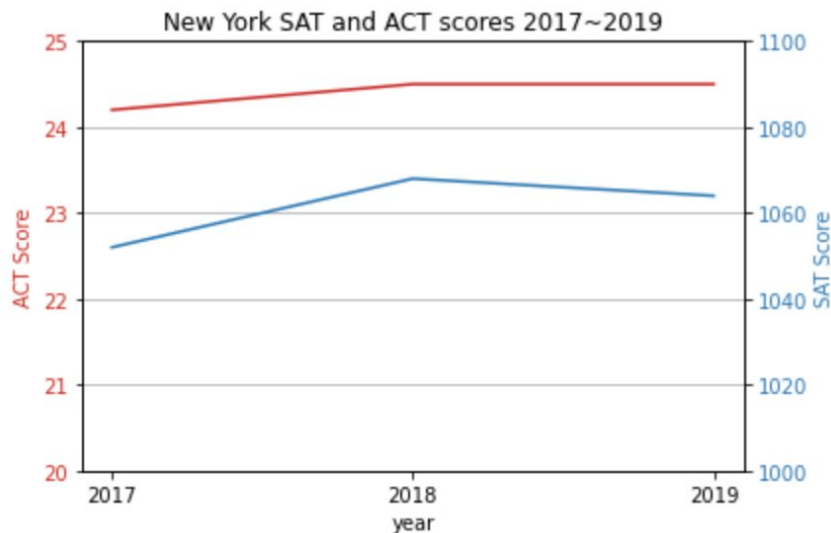
- Benchmarking New York state mean test scores and test participation rates against other states
- Examine any time trends in test scores and participation rate
- Determine if participation rates have an impact on test scores
- Examine if per capita income and state education spending have any impact on test scores, controlling for participation rate

## Data Used

- Mean SAT and ACT scores from 2017 - 2019 (Source: PrepScholar)
- SAT and ACT participation rates from 2017 - 2019 (Source: PrepScholar)
- FY2018 Public Elementary-Secondary Education Finance data (Source: US Census Bureau)
- 2019 State GDP (Source: US Bureau of Economic Analysis)
- 2019 State Per Capita Personal Income (Source: US Bureau of Economic Analysis)

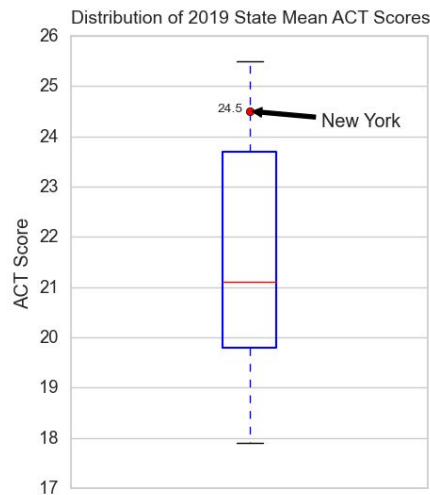
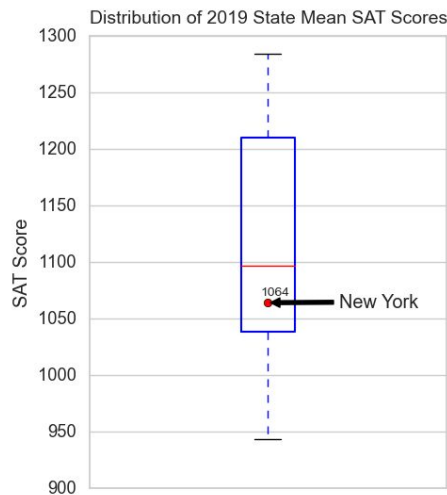
# Mean SAT and ACT scores in New York have remained largely stable in the past 3 years

- New York state's mean SAT and ACT scores have been stable over time
- Mirrors average nationwide performance, which has also been relatively stable over past 3 years

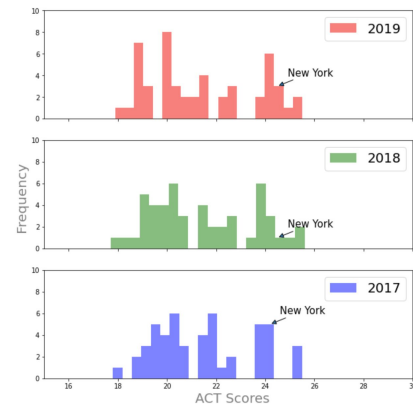
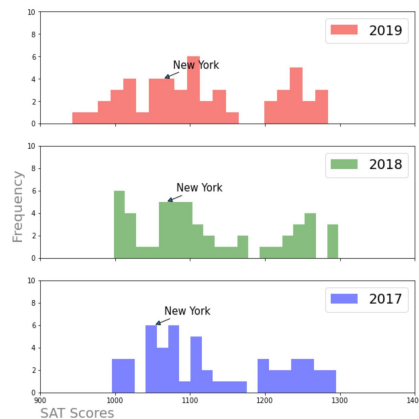


# Students in New York who take the ACT perform better on average compared to students who take the SAT

- In 2019, New York state was ranked 5th highest in mean ACT score and 34th highest in mean SAT score out of 51 jurisdictions
- Ranking amongst states has remained stable over time

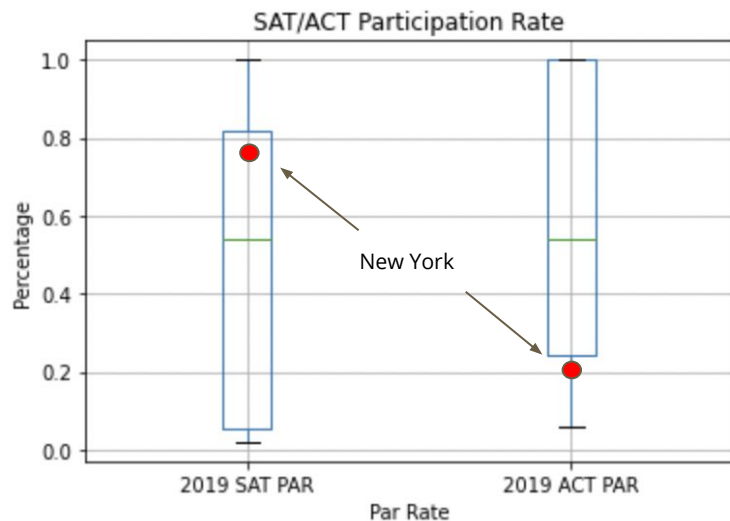


SAT Score distribution over 3 years. ACT Score distribution over 3 years.

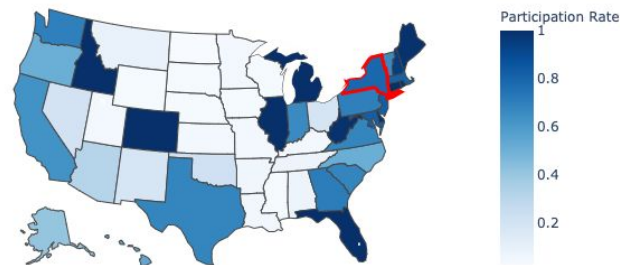


# More students in New York take the SAT compared to the ACT

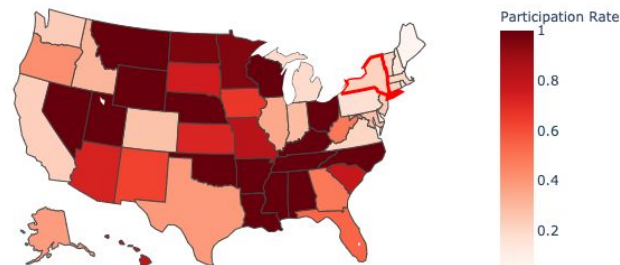
- New York lies in the 3rd quartile for SAT participation rate, but in the 1st quartile for ACT participation rate
- Preference similar to other states in the northeast US



2019 SAT Participation Rate by State

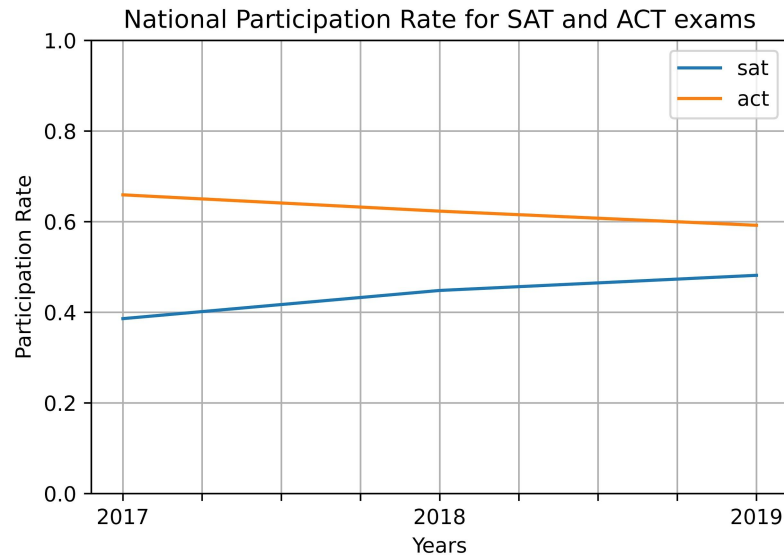
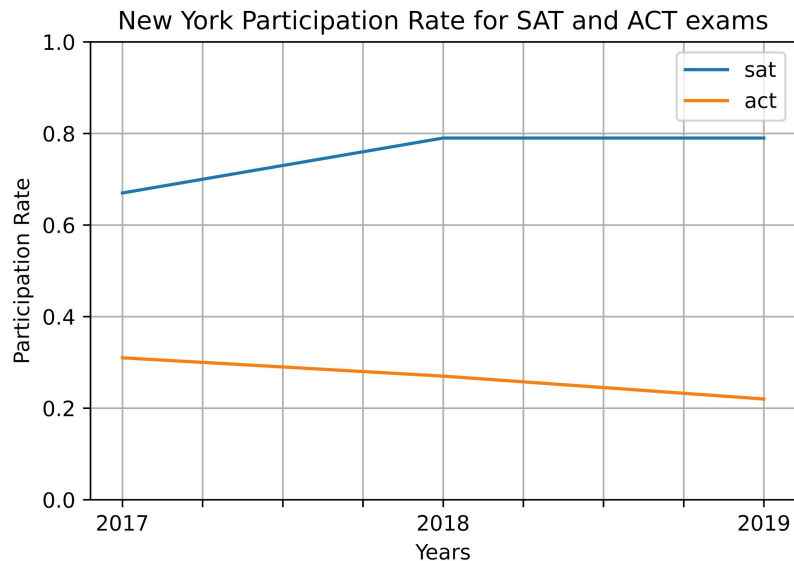


2019 ACT Participation Rate by State



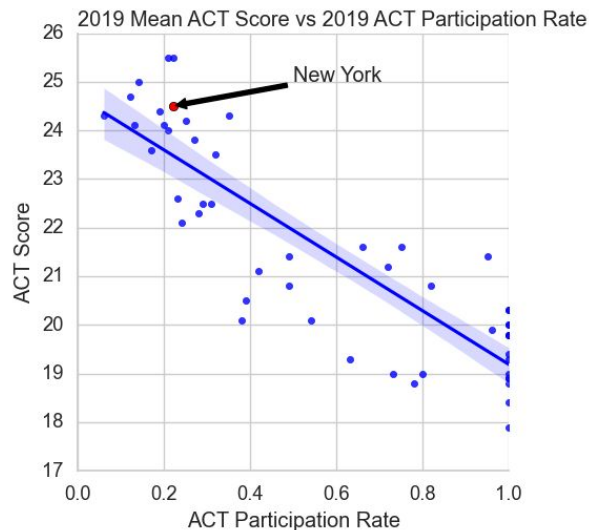
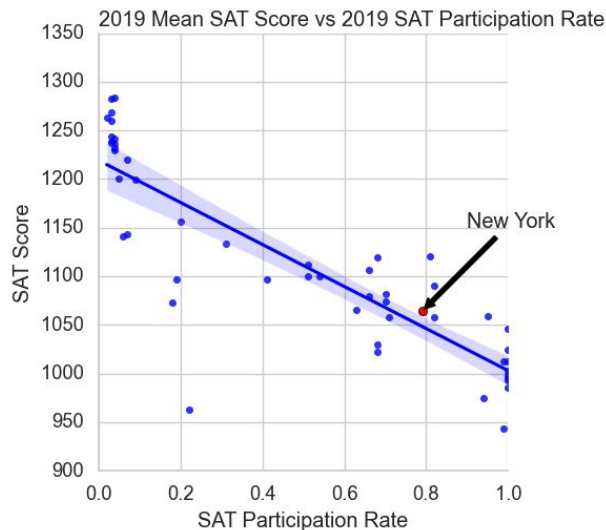
# SAT has increased in participation rate in New York over the past 3 years, while participation rate for the ACT has come down

- SATs consistently more popular compared to the ACTs over the last 3 years in New York
- In contrast, the nationwide participation rate for SAT has been increasing, while that of the ACT has been decreasing.



# New York fared relatively better than other states in both mean ACT and SAT score in 2019 after accounting for participation rate

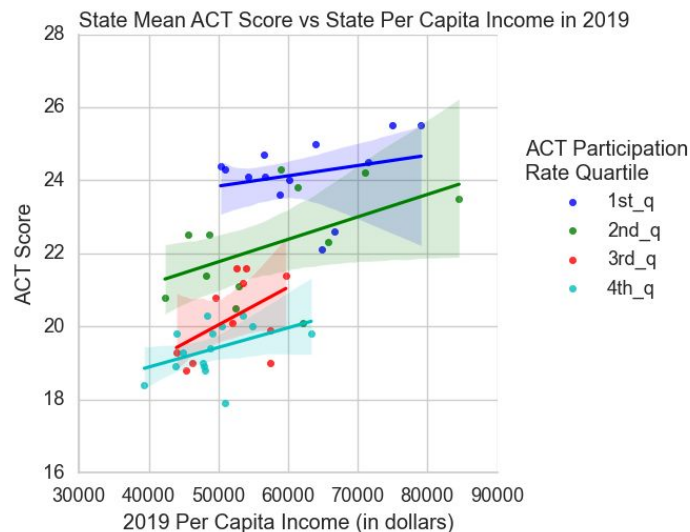
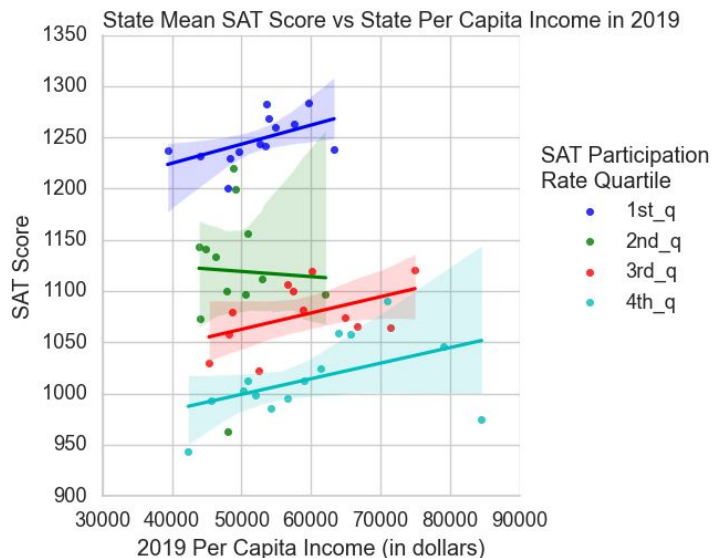
- Negative correlation between SAT/ACT score and participation rate.
  - Due to selection bias - in districts where test not mandatory, students are likely to only take tests if they can do well in them
- Accounting for the effect of participation rate, students in New York seem to do relatively better compared to other states





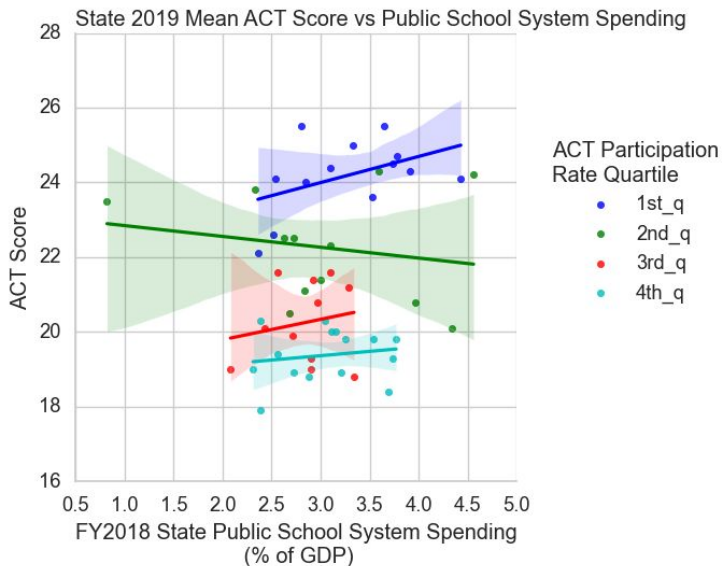
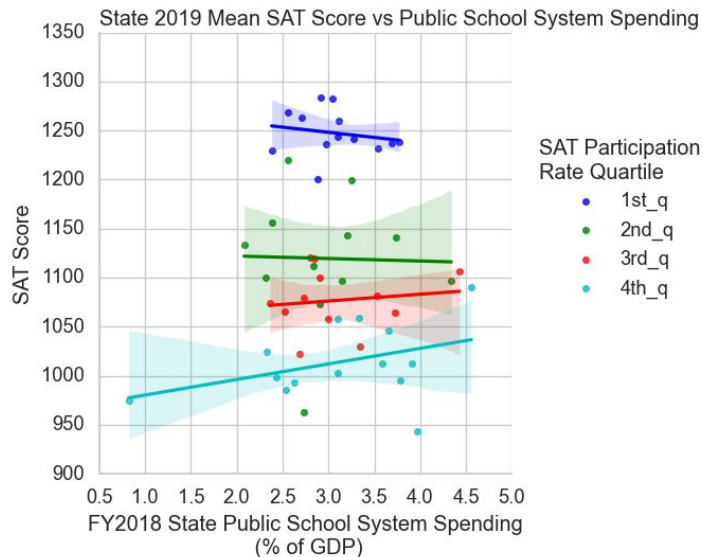
# Per Capita Income seems to have a positive impact on test scores

- To strip out the effect of participation rate on test score, the analysis grouped states into 4 buckets based on their participation rate quartile.
- Within individual buckets, there seems to be a positive correlation between test scores and per capita income
- Could explain New York's better than predicted performance, as New York is 4th highest ranked by per capita income



# Evidence for relationship between test score and public school spending is inconclusive

- Using the same buckets to strip out the effect of participation rate, spending on education does not appear to have much of an effect on test scores
  - Accounted for difference in state size by normalising school system spending as a % of GDP
  - In some buckets, increased public school system spending led to a decrease in scores



# Conclusions and Recommendations

Hypothesis 1: Students in New York state perform better than other states as it is a high income state

- Evidence seems to support the hypothesis
  - While New York is ranked below the median in mean SAT score, this is likely due to the high participation rate inducing a downward bias. After accounting for this, its mean SAT score is better than predicted.
  - Per Capita Income seems to have a positive relationship with SAT scores

Hypothesis 2: The state should increase education spending in order to improve its test scores further

- Inconclusive evidence to support the hypothesis
  - Increased spending may be wasteful and not necessarily lead to better education outcomes

## Recommendations

1. Relative to other states, students in New York state performed well in the SAT and ACT. Existing efforts seem to be adequate and should be continued.
2. Instead of increasing spending wholesale, the Commissioner should examine the influence of other factors (e.g. allocation of spending, class sizes) to see if there are more effective levers to improve student outcomes