SAT & ACT Analysis for 2017 & 2018

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Problem Statement

Participation rate changes have been recorded for both the SAT and ACT exams between 2017 and 2018. This report explores the reasons for the these changes within the United States categorized by test and subject.

Executive summary

2017 Data Import & Cleaning

Errors such as extra characters were corrected and percentages were removed to convert all numerical data in numbers with decimal points.

2018 Data Import and Cleaning

Data was found to match the data fields of 2017's data. The cleaned-up data from both 2017 and 2018 were combined to a single data frame for the ease of comparison.

Exploratory Data Analysis

The standard deviation for each numerical variable were calculated using three different methods. The highest and lowest states were identified in terms of participation rates and scores.

Executive summary con't

Data visualization

Histograms, box plots, and scatter plots were used to investigate the data and correlations further.

Descriptive and inferential statistics

Most of the statistics have a close-to-normal distribution. Although the data points add up to more than 30, more data points would further ensure a closer-to-normal distribution for the numerical variables used in this report.

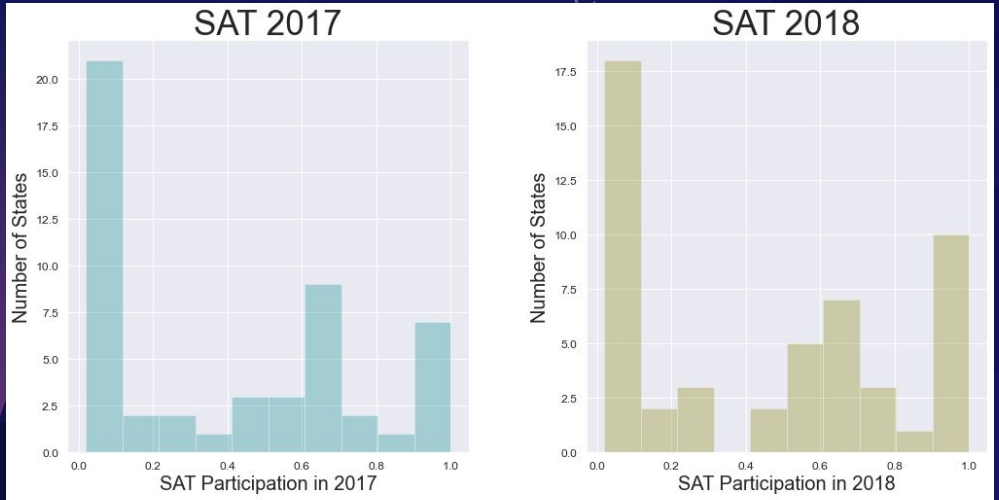
Outside Research

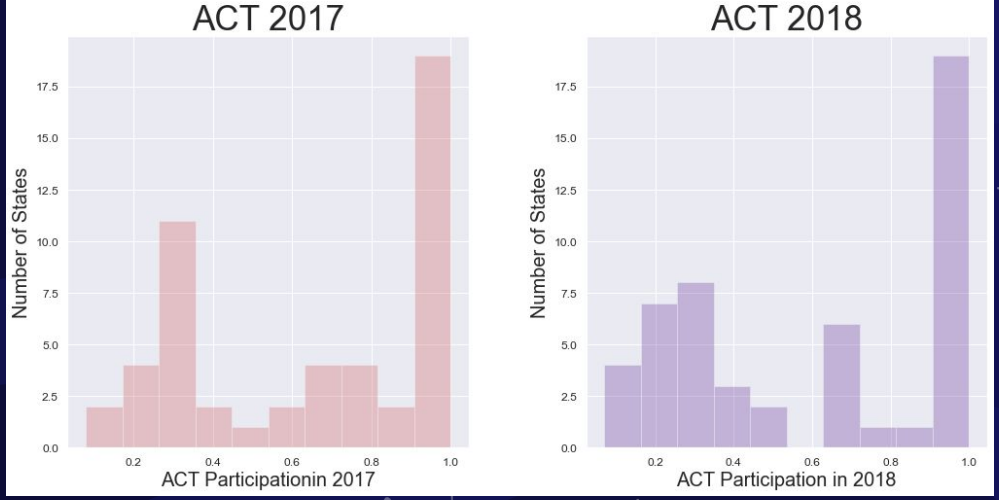
Research has been undertaken from the official State Education Departments and other related articles. Some of these include the details of state policies with regards to the compulsory taking of the exams and/or the sponsoring of test fees.

Data Limitations

Cannot compare scores 1:1 due to their scale differences, instead we compare their proportion to each other.

The participation rates do not reflect the actual number of students taking the tests. Minor changes in participation rates for certain states could actually result in a large increase in the overall number of test takers.



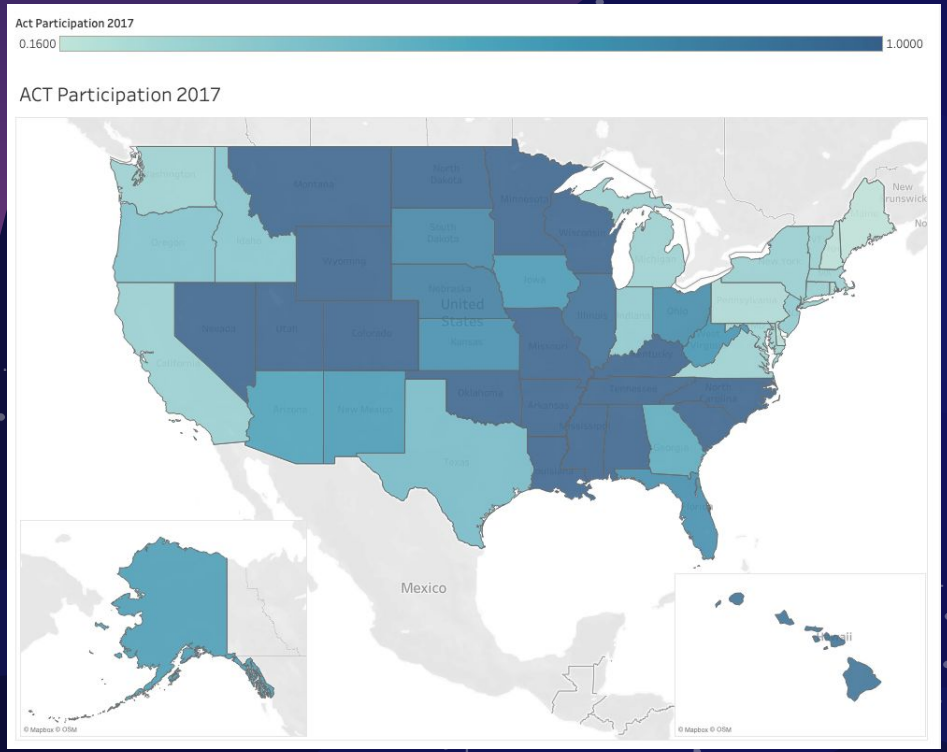


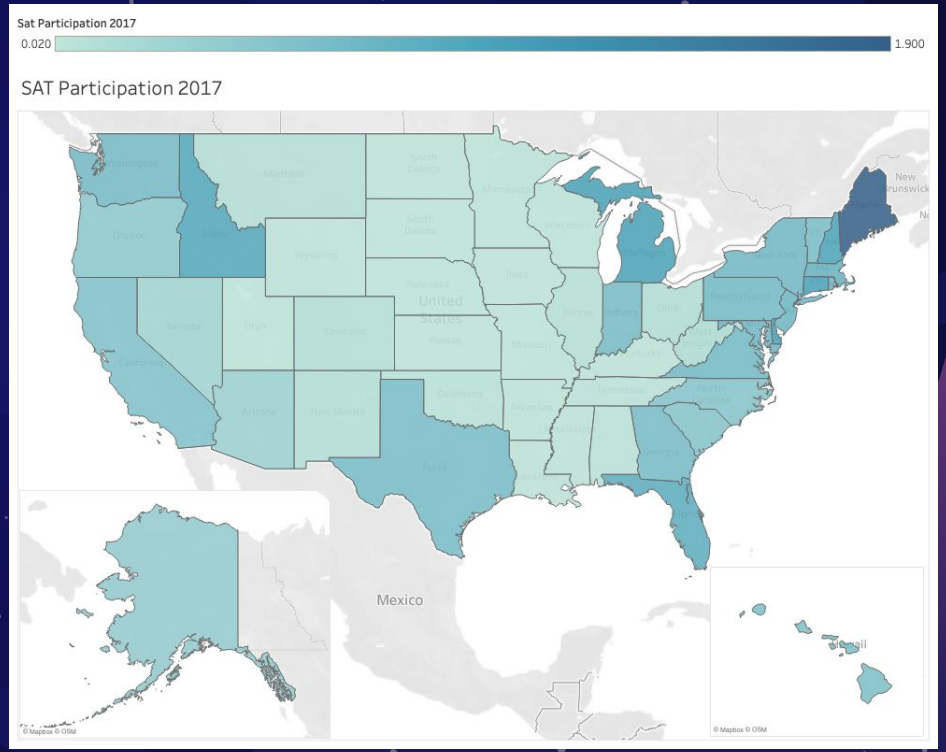
2017 & 2018 Test Participation

In 2017 and 2018 more than 17 states (the majority) had less than 2 % participation in the SAT.

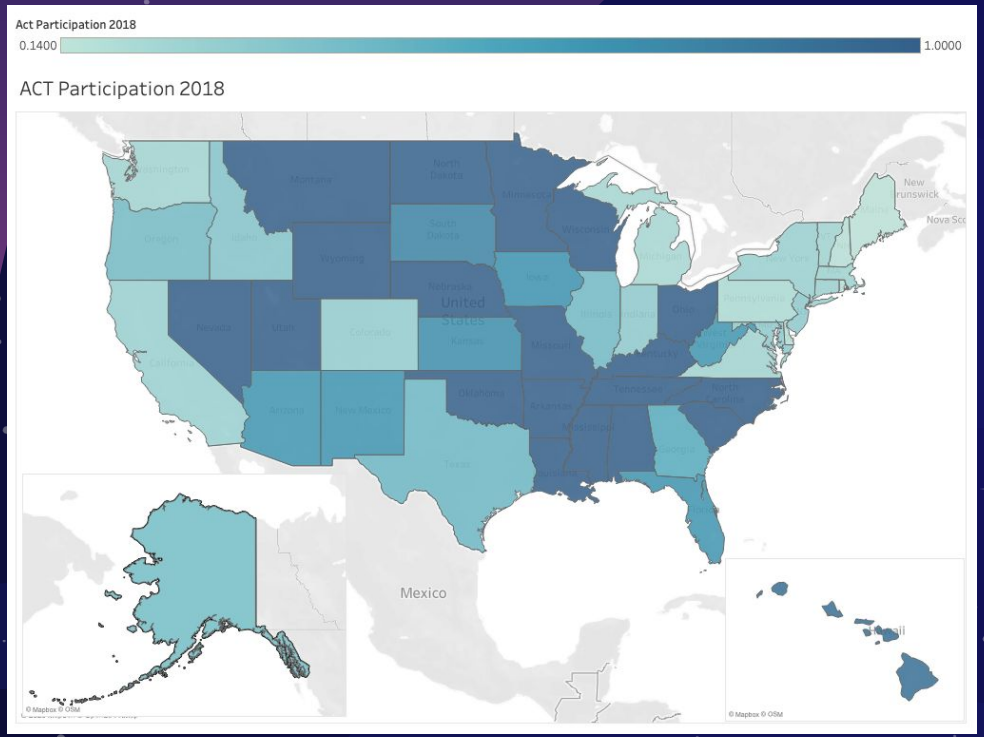
In 2017 and 2018 more than 17 states (the majority) had close to or 100 % participation in the **ACT**.

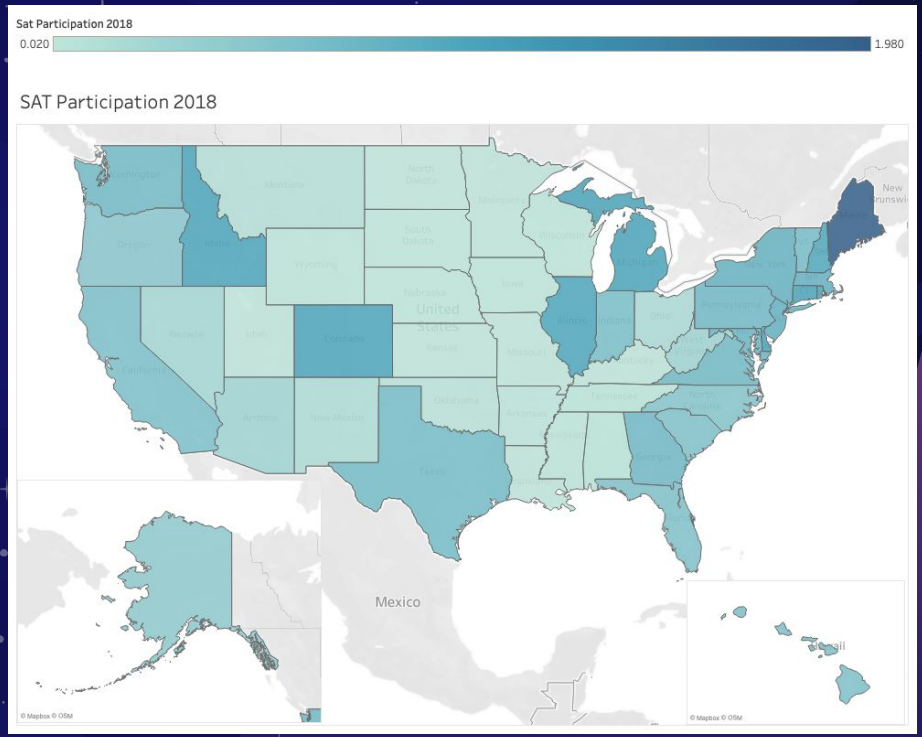
2017 Test Participation

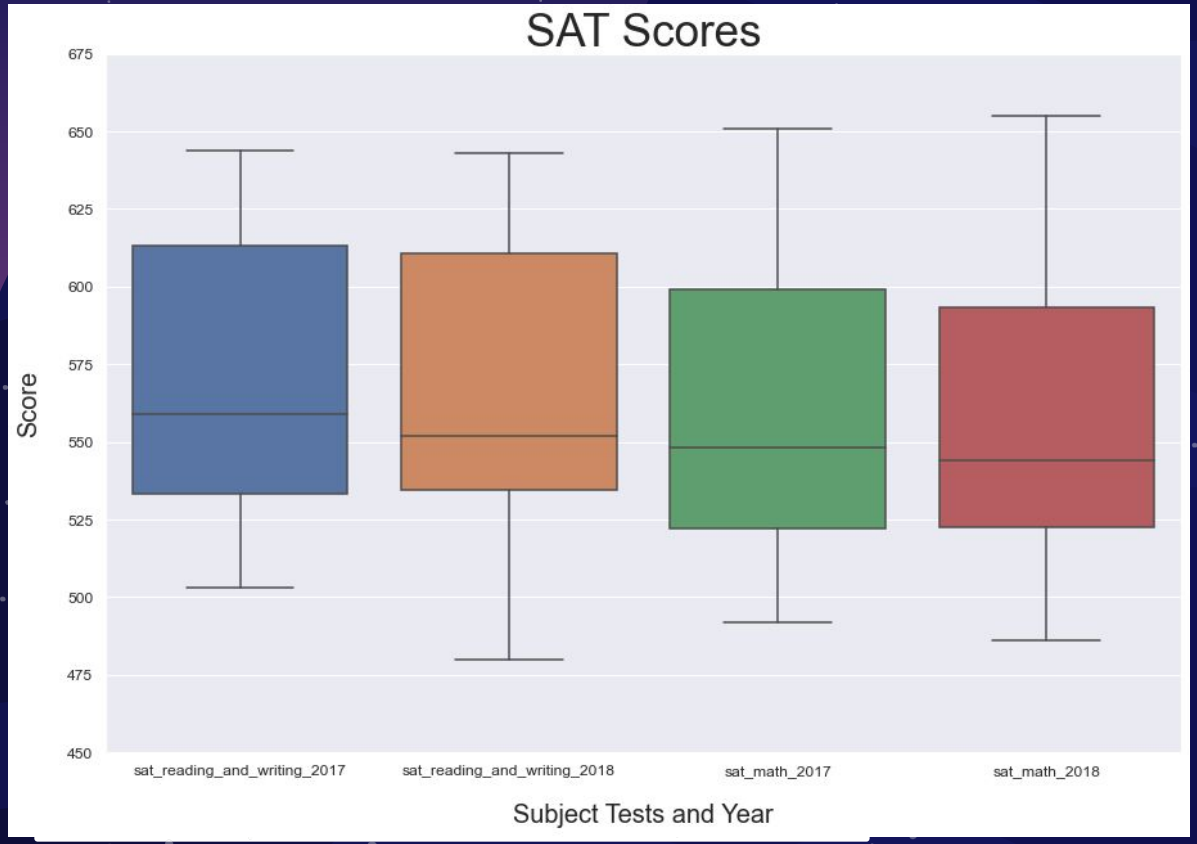




2018 Test Participation



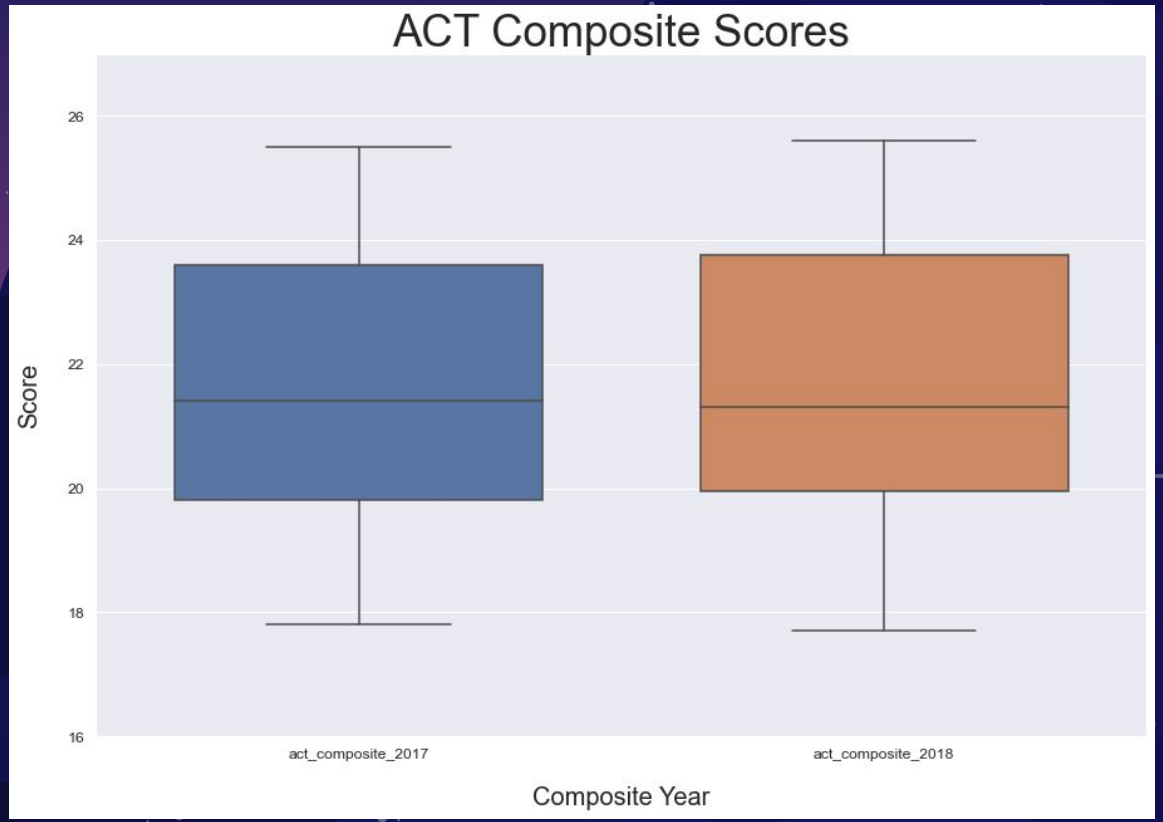




SAT Score Distribution

From the box plots, it can be seen that most of the scores from both tests in both years have a positive skew. Meaning that the lower scores are closer together than that of the higher scores.

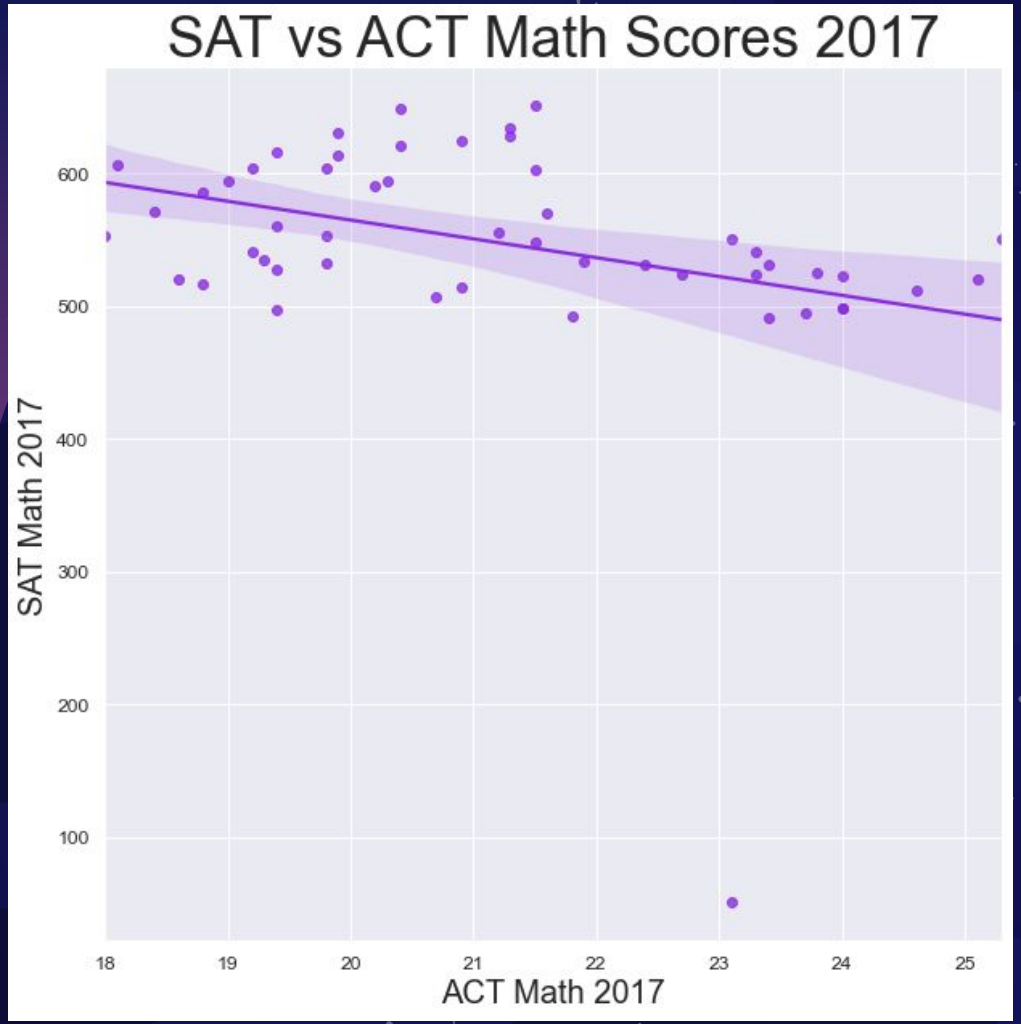
Also, the range of the scores seem to be consistent year to year.



ACT Composite Score Distribution

From the box plots, it can be seen that the composite scores both in years have a positive skew. Meaning that the lower scores are closer together than that of the higher scores.

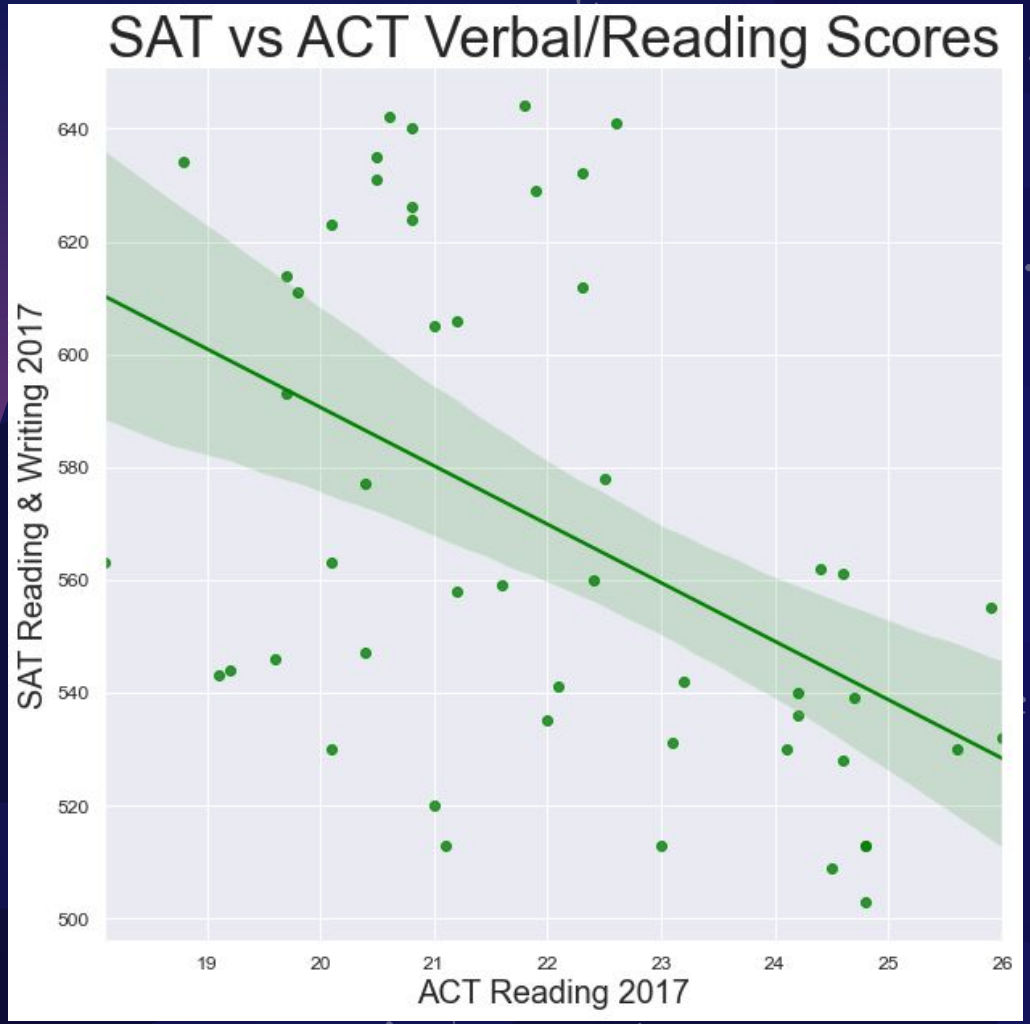
Also, the median and range of the scores seem to consistent year to year.



SAT VS ACT Math trend

The distribution of test scores from the states who participated from the SAT and ACT Math test compared to each other show that states did better on the SAT math than the ACT Math.

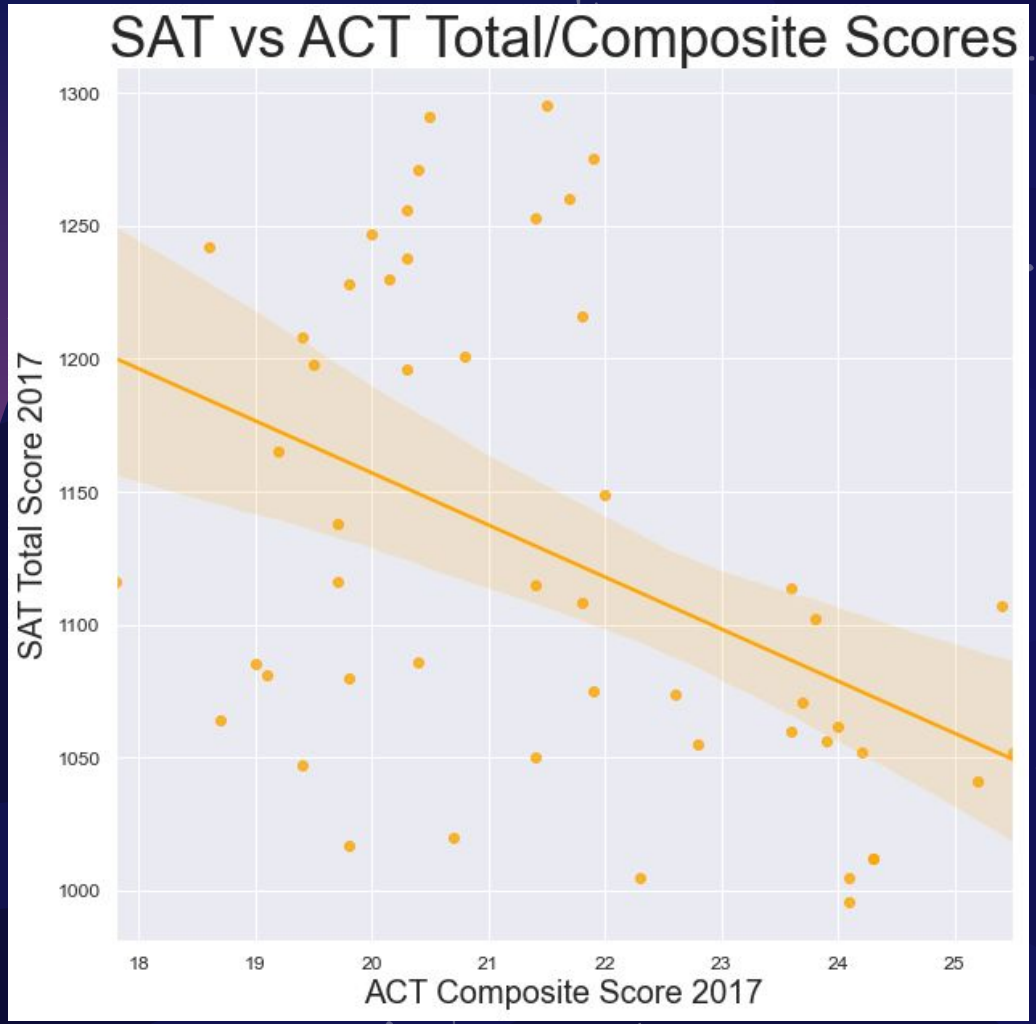
Also, the trend line confirms this by its placement towards the top part of the chart.



SAT VS ACT Verbal / Reading trend

The distribution of test scores from the states who participated from the SAT and ACT Verbal / Reading test compared to each other show that states did better on the ACT Verbal / Reading than the SAT Verbal / Reading.

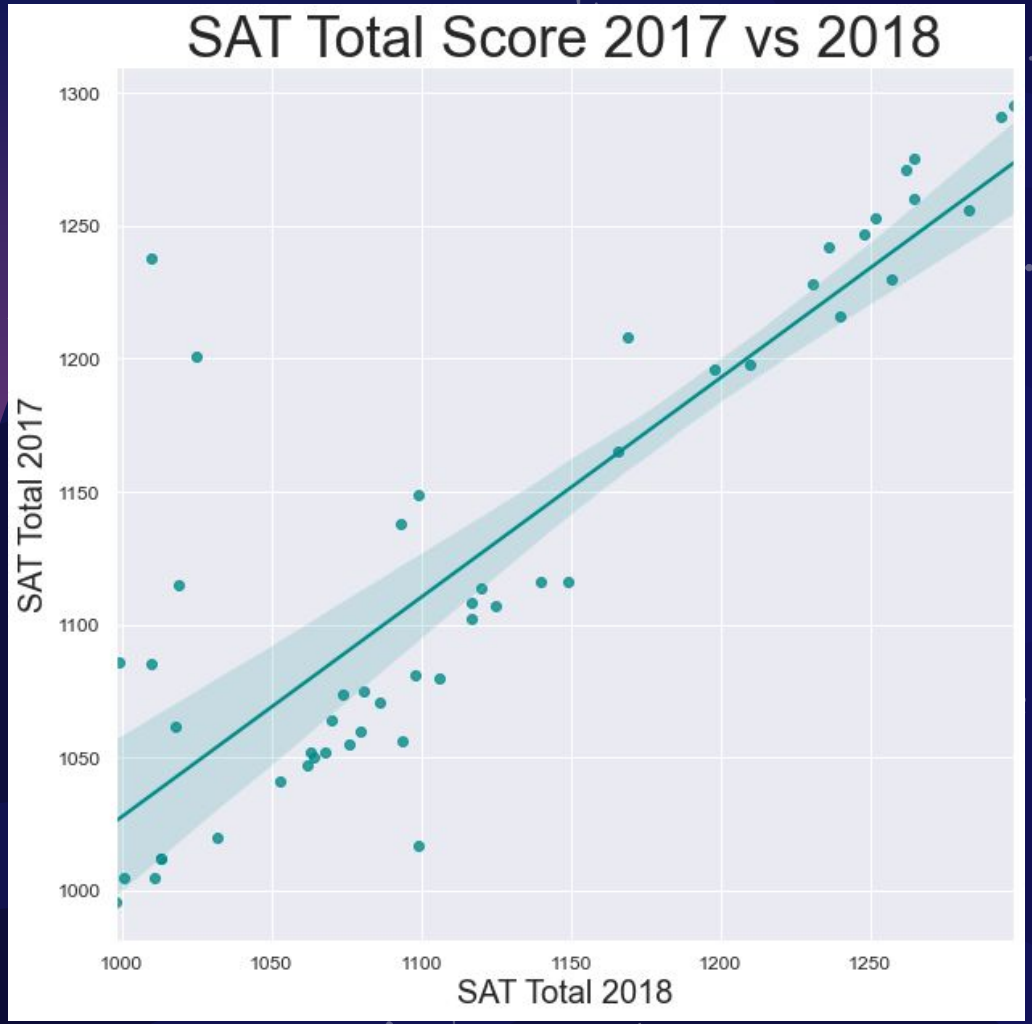
Also, the trend line negative slope confirms this trend by its heading to the bottom right of the chart.



SAT VS ACT composite score trend

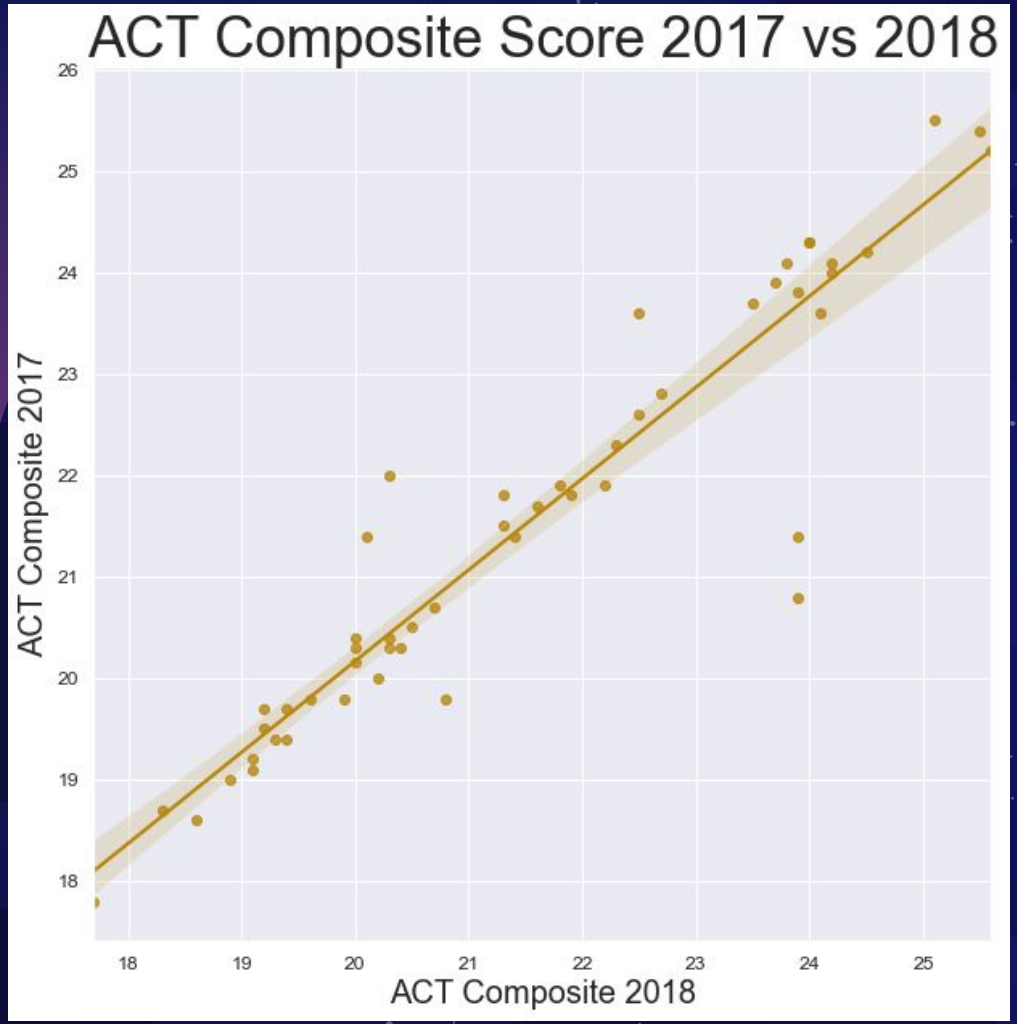
The distribution of test scores from the states who participated from the SAT and ACT Composite test scores compared to each other show that states did better on the ACT than the SAT.

Also, the trend line negative slope confirms this trend by its heading to the bottom right of the chart.



SAT Year to Year Trend

The positive trend line of the two year's scores from the states who participated compared against each other show that the scores seem to be consistent year to year.



ACT Year to Year Trend

The positive trend line of the two year's scores from the states who participated compared against each other show that the scores seem to be consistent year to year.

Key takeaways

Based on the data, major movements in participation rates are spurred on by the state department of education's policies. If a state were to mandate a requirement for all students to take a particular test, the participation rate for the rate would increase exponentially. From further research, I also found that implementation of such policies are usually met on with high opposition from the competition.

Ohio state law requires districts and community schools to administer the state-funded ACT or SAT to all grade 11 students. This has resulted in an increase for participation for both ACT and SAT tests.

Rhode Island has made SAT testing compulsory for all students. This was implemented between 2017 and 2018 and its effects can be seen in the SAT participation, from 71% in 2017 to 97% in 2018.

Illinois, like Rhode Island, has also made SAT testing compulsory for all public high school juniors. This has caused an exponential increase in SAT participation from 9% to 99%. The ACT participation rate was halved during this period. It should be noted that this move by the Illinois State Board of Education opposed this decision and is awaiting the final outcome.

Key takeaways con't

In West Virginia, the participation for SAT has doubled from 14% to 28% while ACT saw a decrease by 5%. This can be attributed to the education department's implementation of the SAT School Day where high school students can take the SAT tests on an allocated school day rather than taking in on a weekend and usually at a test center which they do not school at.

Between 2017 and 2018, 10 states (Colorado, Connecticut, Delaware, Idaho, Illinois, Maine, Michigan, New Hampshire, Rhode Island, and West Virginia) and the District of Columbia covered the cost of the SAT for all their public school students. Previously, only three states and the District of Columbia did so. This, and the implementation of the SAT School Day contributed to the overall 25% increase in SAT test-takers.

As such, the SAT School Day and the cost subsidy of the SAT can be seen to greatly improve SAT participation rates.

Recommendations

First, it is evident that a collaboration with the states' department of education has the highest and most immediate impact on participation rates of a test. This would be in terms of a mandatory test in all schools within the state.

Having said that, it is also paramount to maintain the working relationships with the states already implementing mandatory tests in their location. This would come in the form of customer service, reliability and efficiency in administering the tests and getting the results.

Success stories can also be seen in states where the education department subsidizes the full costs of the test, making them more accessible to lower income students.

Recommendations con't

Second, the college board should explore working with both high schools and colleges. A college's admission criteria based on either of the tests' score would have an huge impact on the perceived value of the test. The value to colleges of a single type of test for the admissions criteria is that they have a single metric which they can rank their applicants by, rather than having to compare their over two sets of metrics. Colleges have also been observed to be moving away from standardized tests. This issue should also be addressed to prove the need for these tests in providing impartial information about their applicants.

Last, further research should be done on the university admissions criteria, the type of test and the scores students have been accepted upon and the composition of students taking both tests. Furthermore, information about the test centers and their usage could also shed some light on the matter. These would help to identify both tactical and strategic targets for College Board to further improve the SAT participation.

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