2017 - 2018

SAT & ACT analysis

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Problem Statement

The new format for the SAT was released in March 2016. The ACT, which is the alternative standardized test used for college admissions, has been steadily gaining popularity as the test of choice amongst students in recent years.

We are keen to investigate the changes in statewide SAT test participation rates and the factors influencing them, and to **identify recommendations that could be taken by the College Board to boost SAT participation rates** in the years ahead.

Data Cleaning

IMPORTING DATA

The datasets were imported from the relevant .csv files into pandas DataFrames

Columns were cleaned and converted into the appropriate data types (*int*, *float* or *object*)

Extraneous rows were removed and problematic individual values were cross-referenced and corrected

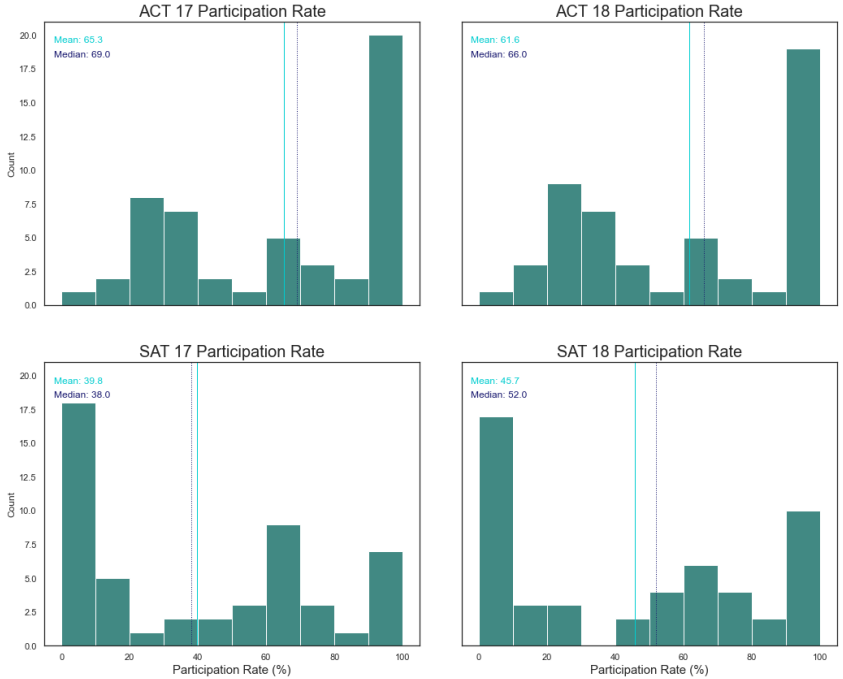
MERGING

Resultant cleaned 2017 and 2018 datasets were merged into a final DataFrame, *sat_act*

Data Dictionary

Feature	Type	Dataset	Description
state	*object*	ACT/SAT 2017	The name of the state where the ACT or SAT was conducted in.
sat17_participation	*int*	SAT 2017	The SAT participation rate for the state in 2017 (in %).
sat17_readwrite	*int*	SAT 2017	The state mean score for the SAT Evidence-Based Reading and Writing section in 2017 (from 200 to 800).
sat17_math	*int*	SAT 2017	The state mean score for the SAT Math section in 2017 (from 200 to 800).
sat17_total	*int*	SAT 2017	The state mean total score for the SAT test in 2017 (from 400 to 1600).
sat18_participation	*int*	SAT 2018	The SAT participation rate for the state in 2018 (in %).
sat18_readwrite	*int*	SAT 2018	The state mean score for the SAT Evidence-Based Reading and Writing section in 2018 (from 200 to 800).
sat18_math	*int*	SAT 2018	The state mean score for the SAT Math section in 2018 (from 200 to 800).
sat18_total	*int*	SAT 2018	The state mean total score for the SAT test in 2018 (from 400 to 1600).

Participation Rates



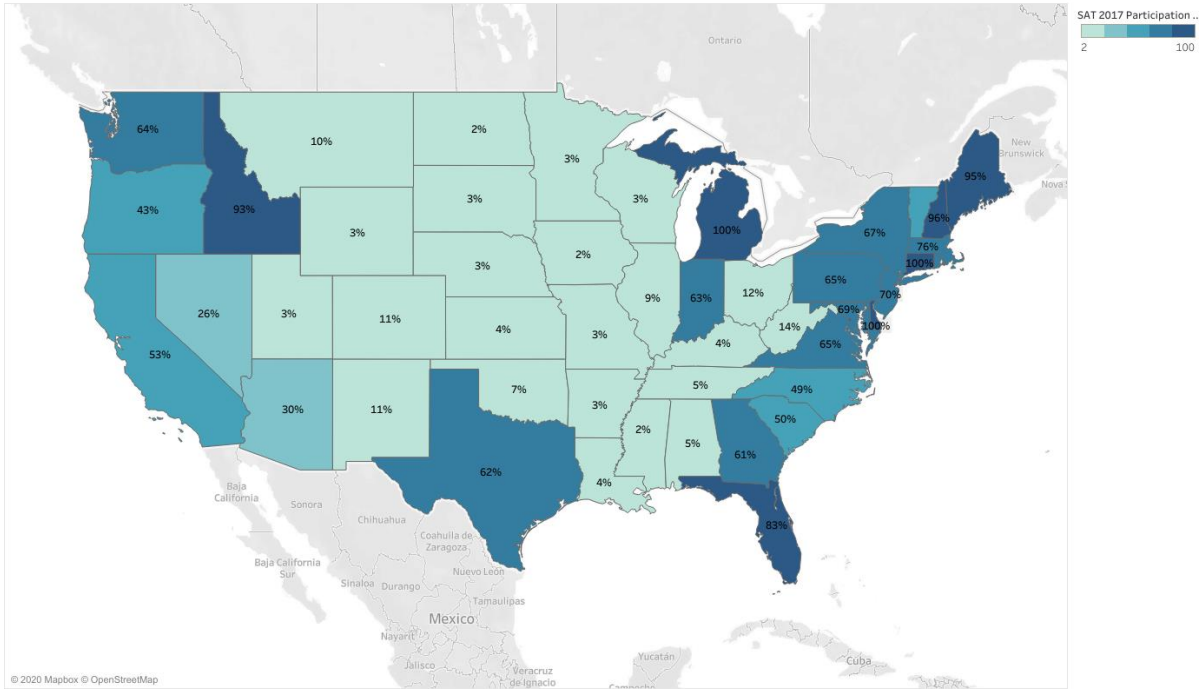
Participation rates for ACT 17, ACT 18, SAT 17 appear **unimodal**

Participation rate for SAT 18 appears **bimodal**

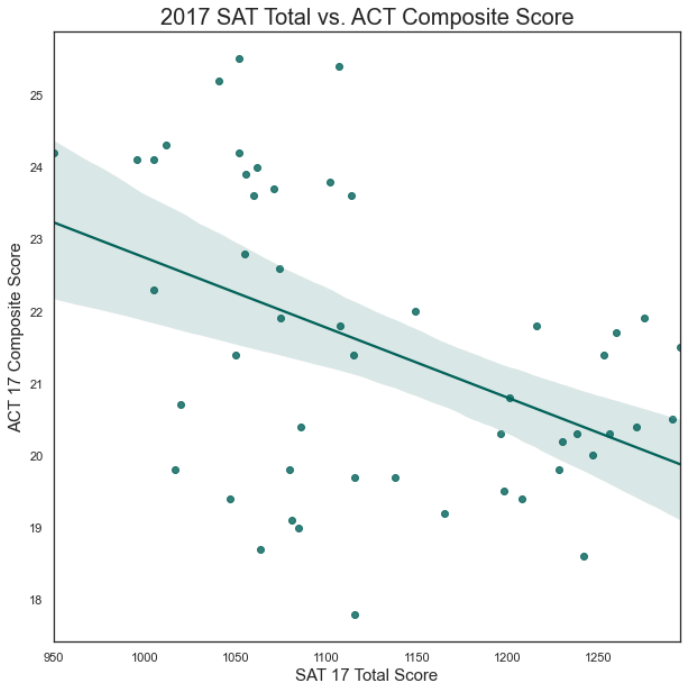
Large spread in the participation rates

SAT participation rates clustered in the lower range, while ACT participation rates are clustered in the upper range

SAT Participation 2017



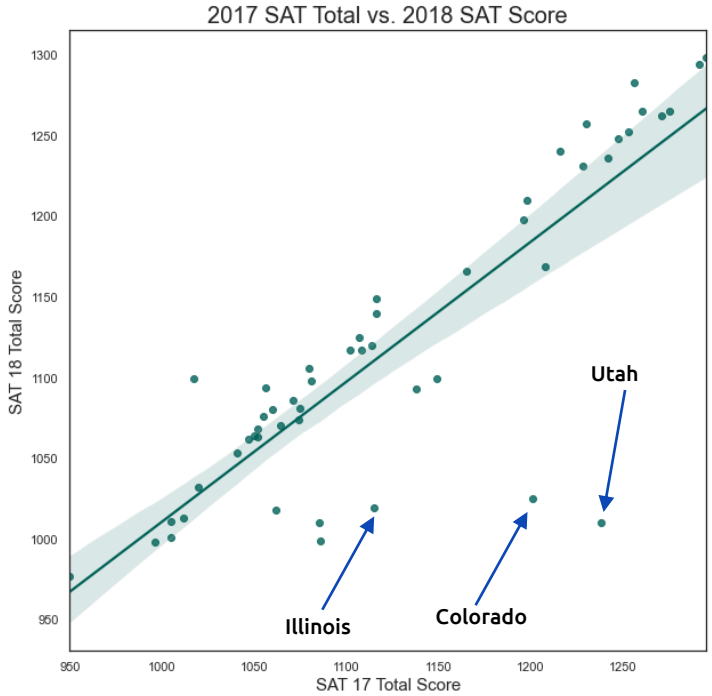
SAT Total vs. ACT Composite Scores



Weak negative correlation between SAT Total and ACT Composite scores

Most of the data points fall far away from the best fit line

SAT 2017 vs. 2018 Total Score

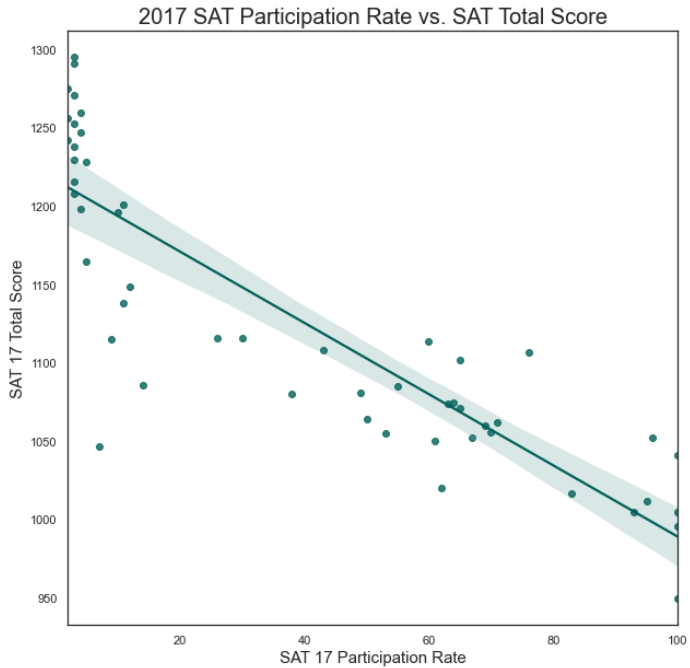


Strong positive correlation between SAT 17 and 18 scores

Most of the data points are clustered near the line of best fit

States tend to perform better in 2017 than in 2018 (notable decreases in score include **Colorado** (1201 to 1025), **Illinois** (1115 to 1019) and **Utah** (1238 to 1010)

SAT 17 Participation Rate vs Total Score

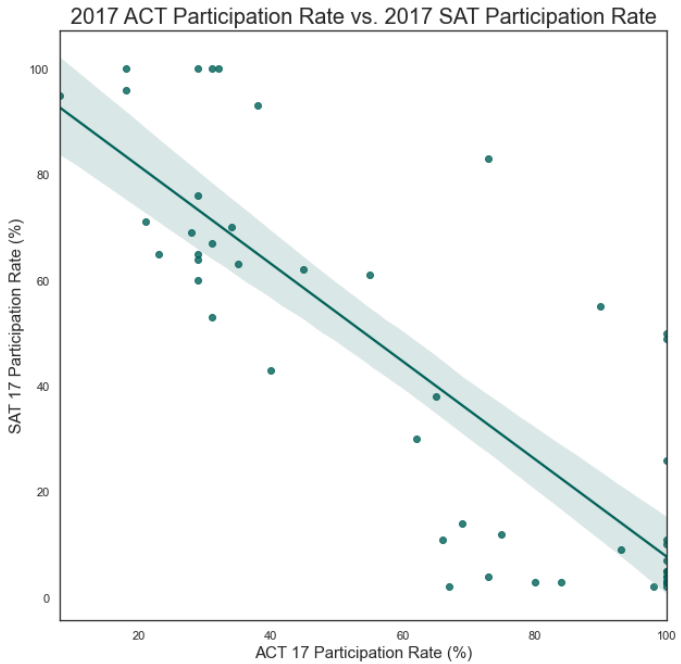


Strong negative correlation between SAT 17 and 18 scores

Likely the result of **selection bias**

Large cluster of points on the top left of the plot (i.e. for states where ACT is mandatory, mainly students who are highly motivated would bother to take both tests)

SAT 17 vs. ACT 17 Participation Rate

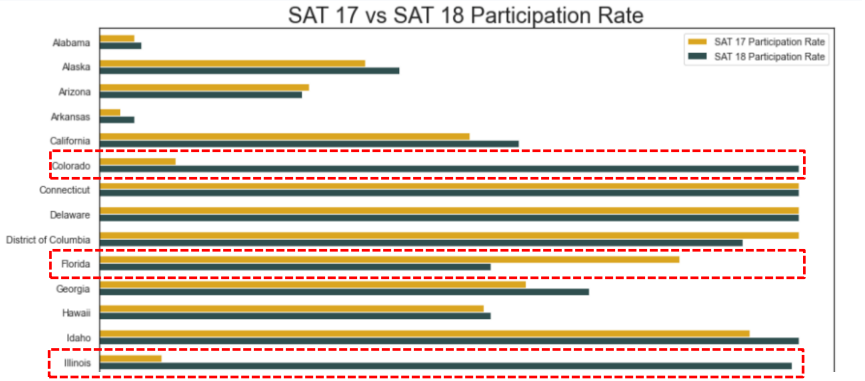


Strong negative correlation between SAT and ACT participation rates

Most universities accept both SAT and ACT test results as a form of standardized score to measure college readiness

Students are likely to take **only one or the other**

Changes in SAT Participation Rate from 17 to 18



Bar plot of each state's SAT participation rate from 2017 to 2018

Colorado's SAT participation rate increased from **11%** to **100%**

Illinois' increased from **9% to 100%**

Large spikes in participation rates are typically brought about by state-mandated policies

Florida's SAT participation fell from **83%** to **56%**, despite neither the SAT nor ACT being made mandatory

Key Findings

SAT VS. ACT

Strong negative correlation between SAT and ACT participation rates

Little merit in taking both tests, except for high performers

PARTICIPATION VS. SCORES

State mean scores tend to fall as participation increases, as the proportion of students who are not incentivized to perform increases

STATE POLICIES

State mandated testing can significantly boost participation rates, at the cost of lower mean state scores

Recommendations

FOCUS EFFORTS

Target states that do not have extremely high ACT participation rates

WEST VIRGINIA

2017: **14%,**
2018: **28%**

Neither ACT nor SAT testing is made mandatory in West Virginia

WORK WITH LOCAL AUTHORITIES

Consider subsidizing testing fees, implementing ‘SAT School Day’ programs

PROVIDE SUPPLEMENTARY RESOURCES

Allow students to perform better and increase state-wide test performance