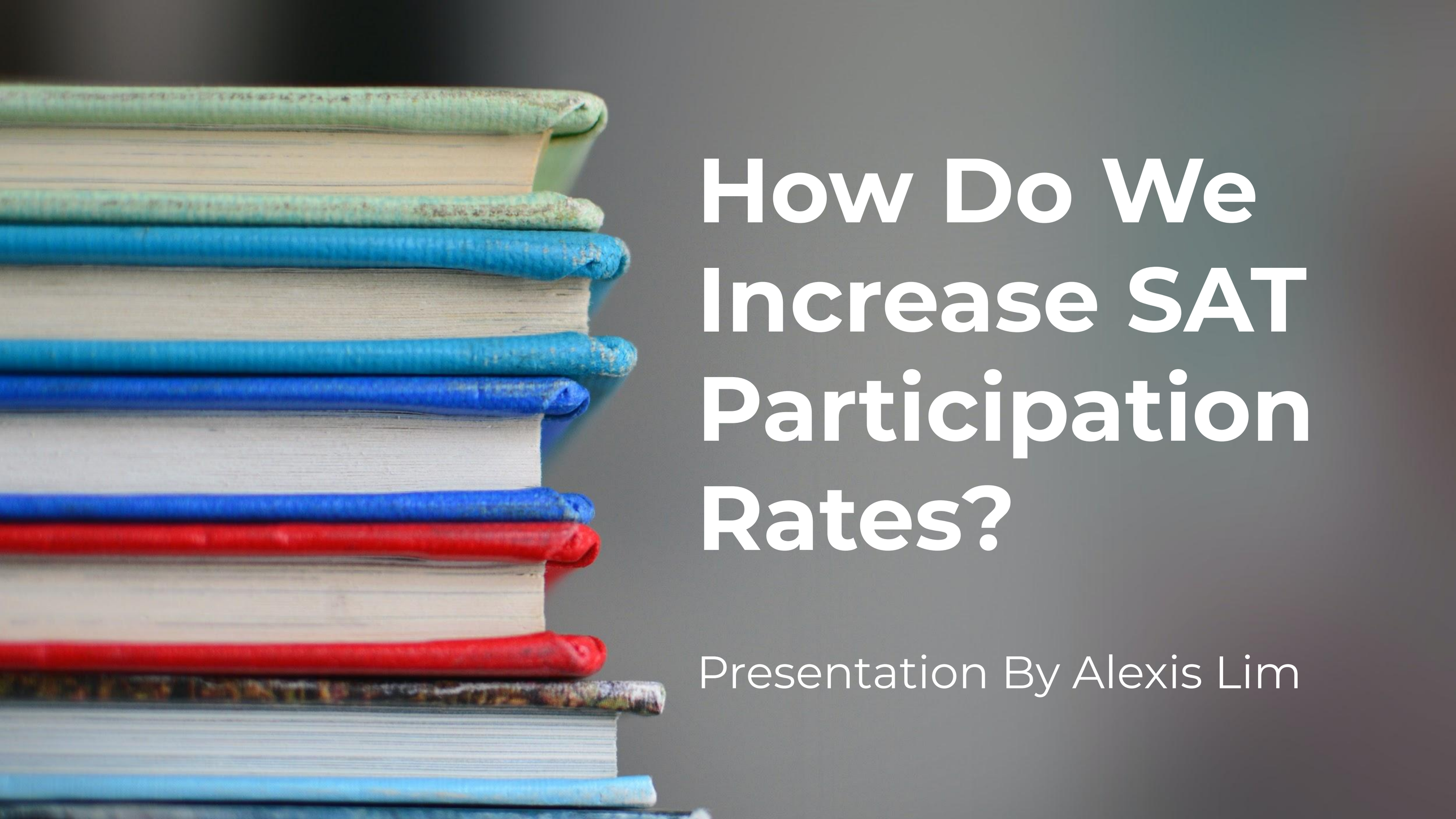

How Do We Increase SAT Participation Rates?

Presentation By Alexis Lim

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Background

The SAT and ACT are competitors as standardised tests in the United States, where SAT and ACT scores are often a component of college applications for high school seniors. Hence, many high school students choose to take either the SAT, ACT or both in their junior year.

By examining state mean participation rates and subject/total scores in 2017 and 2018 for both tests, we aim to identify relationships in the available data and provide recommendations on how the College Board can look to increase participation for the SAT.

Data Sources

- 2017 SAT Scores by State
- 2017 ACT Scores by State
- 2018 SAT Scores by State
- 2018 ACT Scores by State

Data Summary

The SAT and ACT datasets contain the following variables and initial data types:

SAT 2017 [5 columns x 51 rows]		ACT 2017 [7 columns x 52 rows]	
State	Object	State	Object
Participation Rate	Object	Participation Rate	Object
Evidence-based Reading & Writing	Integer	English	Float
Math	Integer	Math	Float
Total	Integer	Reading	Float
		Science	Float
		Composite	Object
SAT 2018 [5 columns x 51 rows]		**ACT 2018 [7 columns x 51 rows]**	
State	Object	State	Object
Participation Rate	Object	Participation Rate	Integer
Evidence-based Reading & Writing	Integer	English	Float
Math	Integer	Math	Float
Total	Integer	Reading	Float
		Science	Float
		Composite	Float

Data Processing

To process and treat the datasets to conduct our analysis, the following steps were taken:

Data Verification

For the 2017 data, the ACT science scores, SAT math scores and ACT composite scores contained inaccurate values. The accurate values were obtained from the data sources and reassigned.

Data Retyping

The variables were converted to appropriate data types. For example, the % sign was removed from the participation rates and they were converted to floats.

Dataset Standardisation

All columns were renamed for standardisation across datasets to remove spaces and converted to lowercase. Additionally, the ACT 2017 contained an additional row for “National” values which was removed.

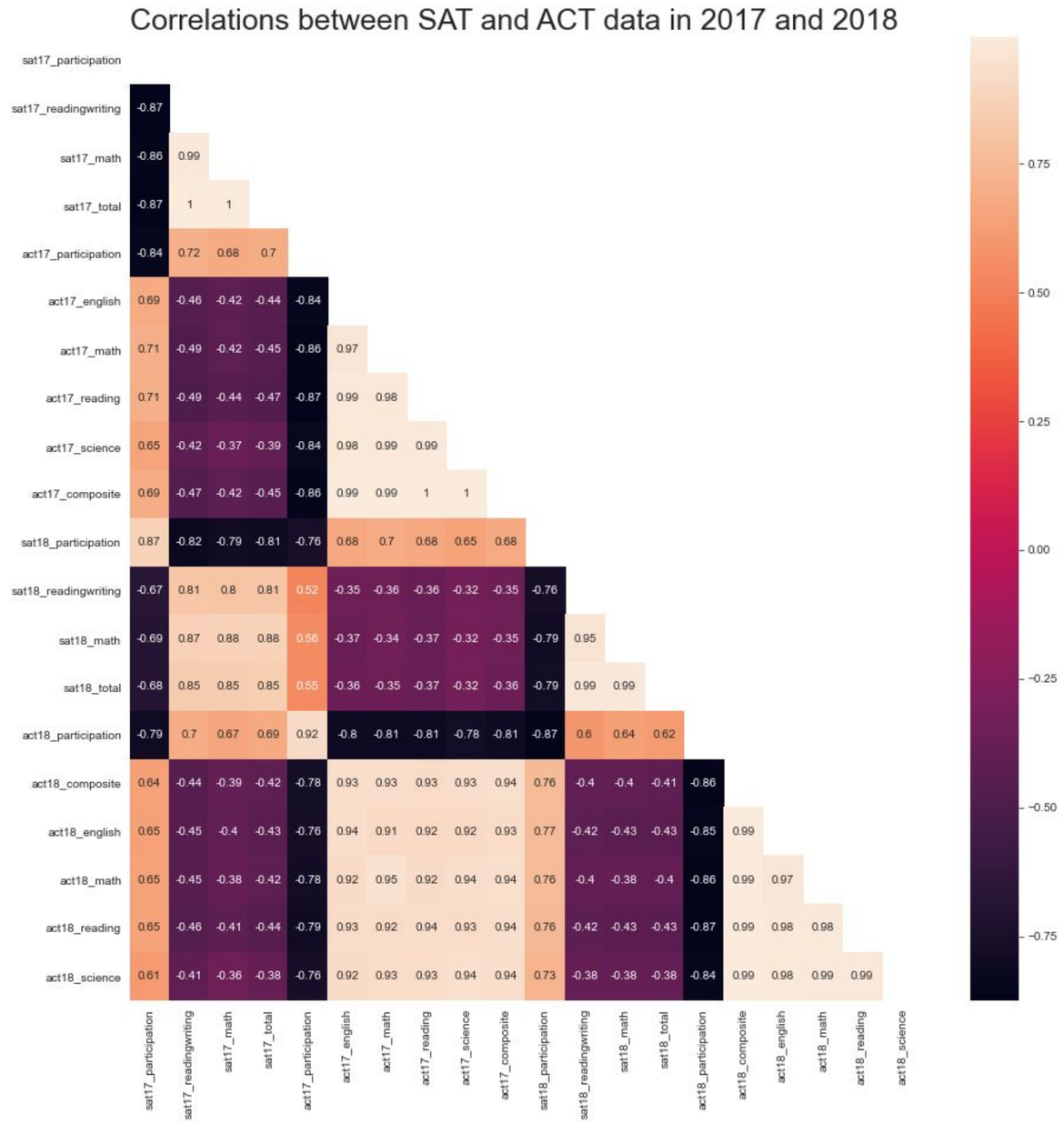
Data Limitations

Considering the data that we have available, there are limitations for our conclusions:

1. We cannot make inferences for a national population based on the state samples as the samples are **not randomly drawn,** nor do we have access to the standard deviation or sample size data.
2. As we only have data for 2017 and 2018 and not for subsequent or preceding years, our trend analysis is **limited to these 2 years**.
3. With the **aggregation of data by state**, we only have 51 data points per dataset to work with and cannot make more granular analyses on a county or school level.
4. The data does not include information such as **state policies** which we will have to conduct outside research for.

Our conclusions and recommendations will have to take into consideration the above limitations to the data.

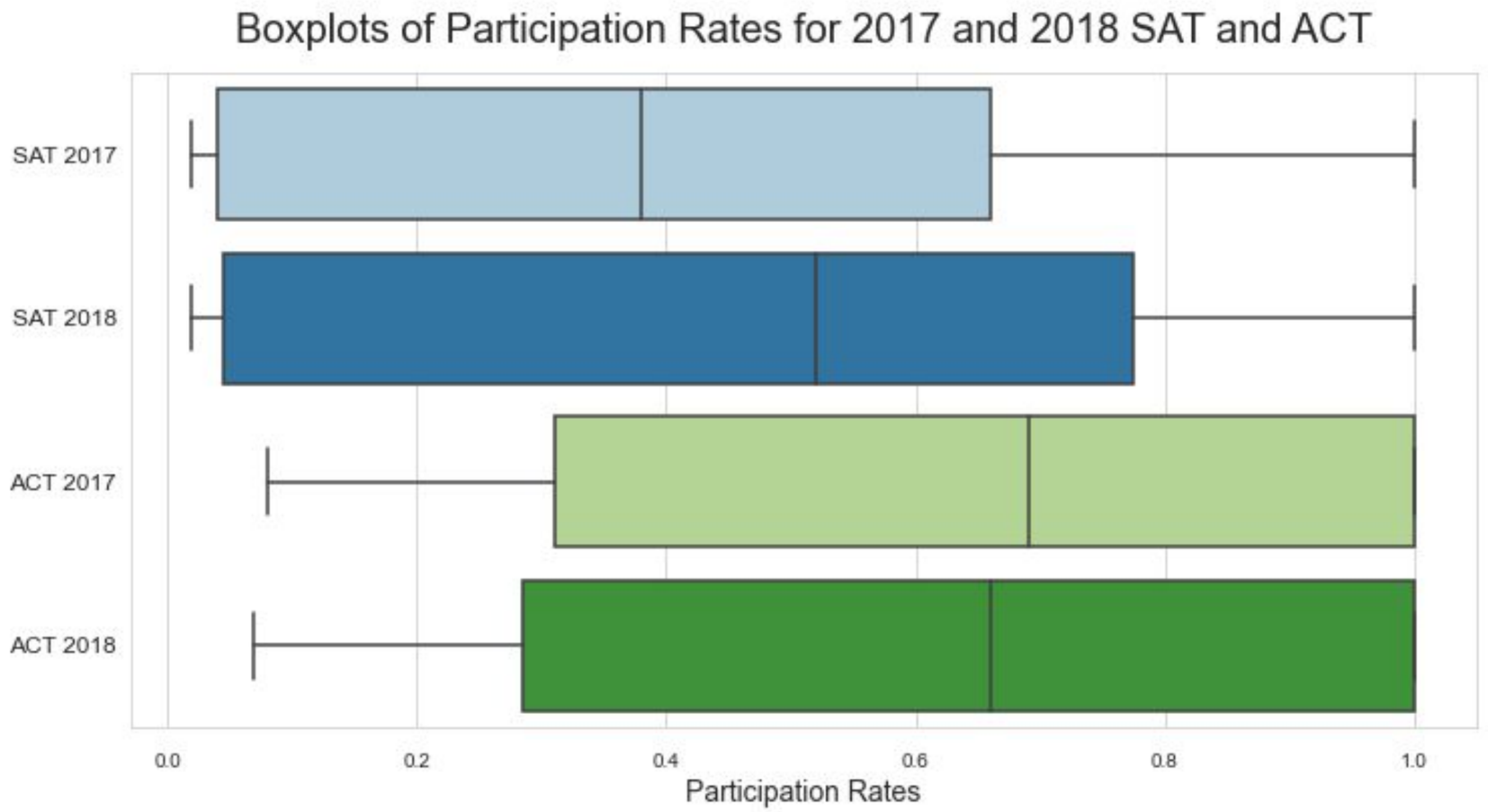
Relationships Between Our Variables



- Participation rates for each test are strongly negatively correlated with participation rates for the other test. As states move toward higher participation in either test, there is a corresponding decrease in participation for the other test.

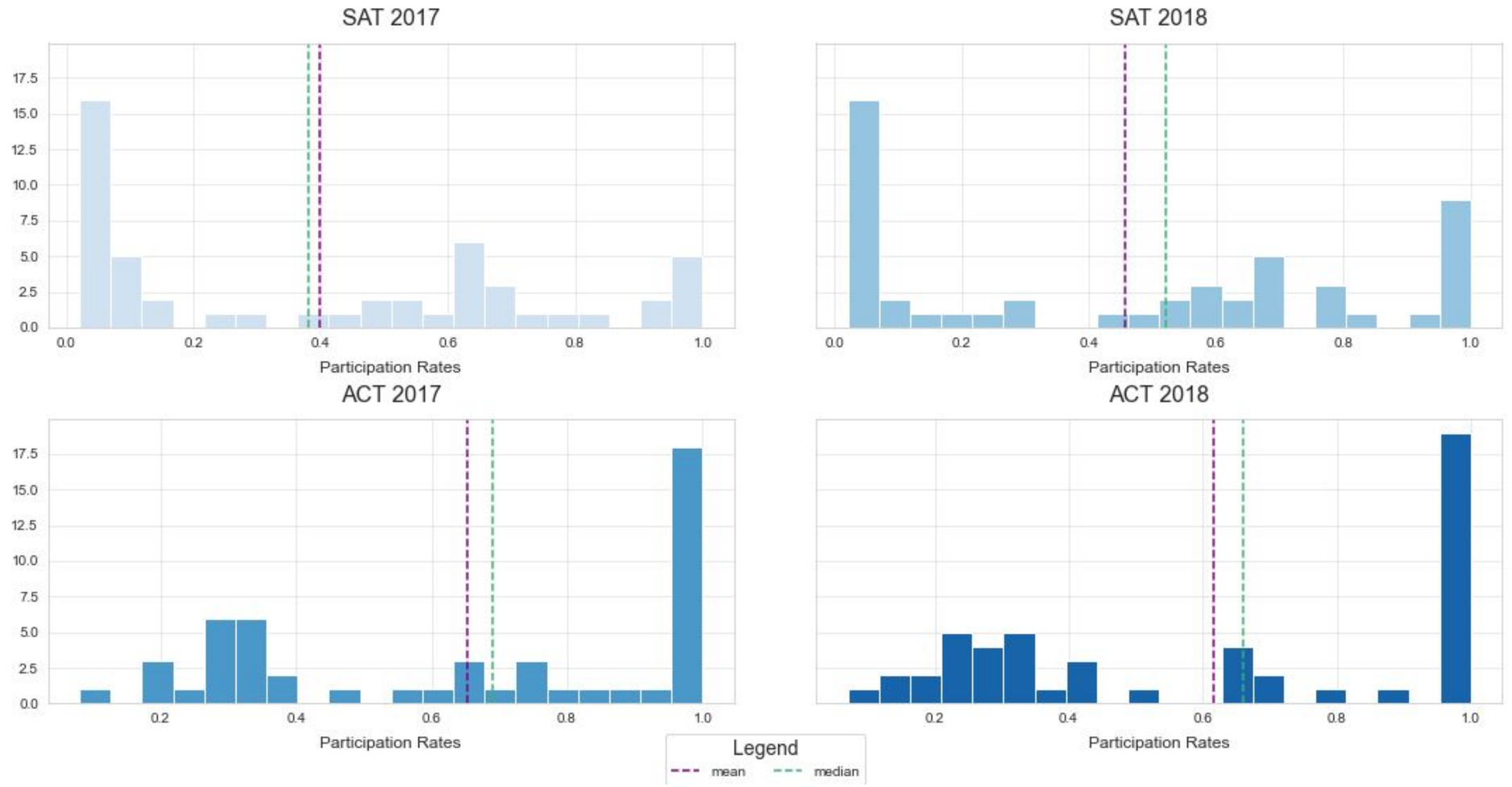
- Participation rates are also strongly negatively correlated with scores for the respective tests i.e. lower SAT participation rate with higher SAT scores.

Comparing ACT and SAT Participation Rates



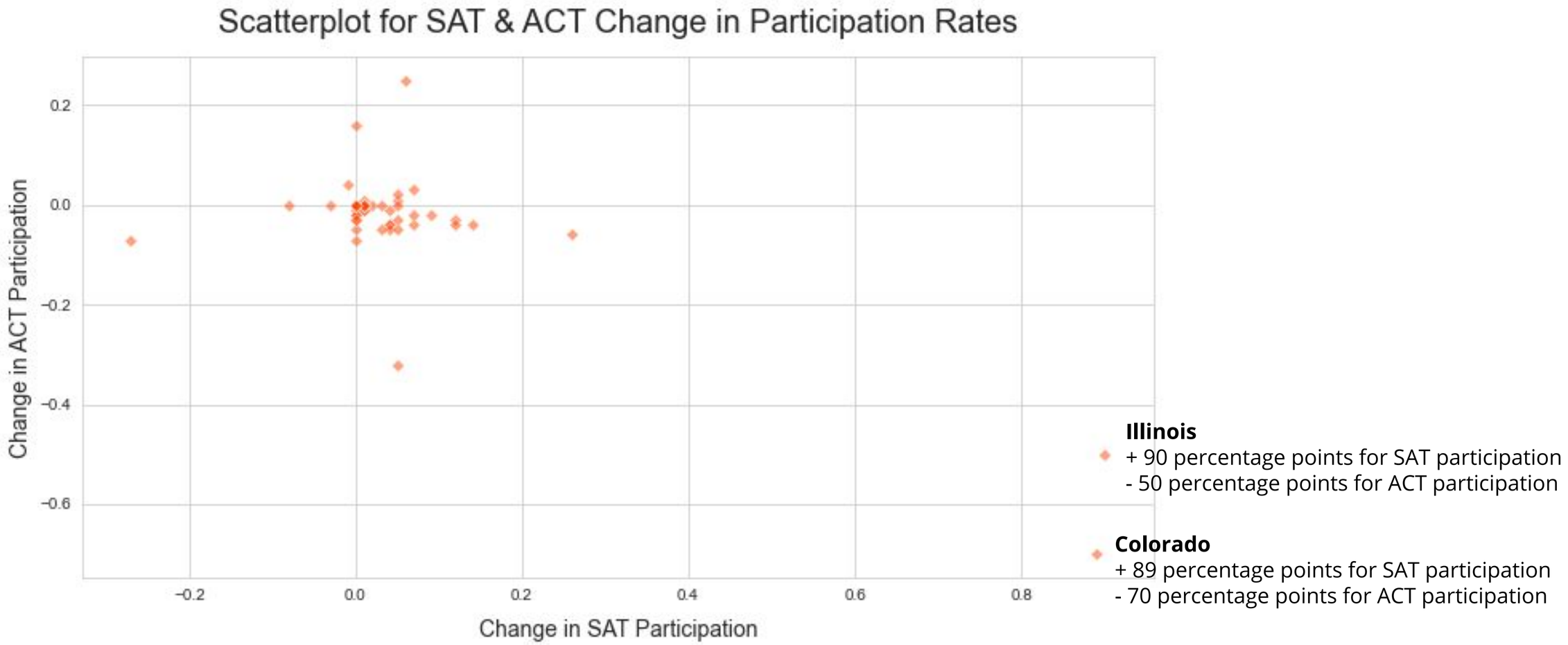
While both tests have states with 100% participation rates in both 2017 and 2018, the ACT test appears to be more popular with more than half of all states having a participation rate of 60% and above. However, we can see a growth in the popularity of the SAT year-on-year as the median SAT participation rate has improved from below 40% to more than 50%

Comparing ACT and SAT Participation Rates



The ACT participation rates are left-skewed while the SAT participation rates are right-skewed, with more values falling in the lower end for the SAT. The mean and median rates for ACT are higher than those for SAT in both years, although we see an increase in the median participation rate for the SAT in 2018. Similar to the boxplots, we can see that the ACT enjoys more popularity in terms of participation rates.

Year on Year Changes in Participation



Most states did not see a significantly large change in participation rates, as we can see most of the data points fall within the +/-0.2 range on both x and y axes. It appears that the SAT saw more states with an increase in participation rates, although the increase was generally quite small. However, Illinois and Colorado saw significant changes in both SAT and ACT participation rates (>50%).

Deepdive into Illinois and Colorado

	state	sat17_participation	act17_participation	sat18_participation	act18_participation	sat_part_difference	act_part_difference
5	Colorado	0.11	1.00	1.00	0.30	0.89	-0.7
13	Illinois	0.09	0.93	0.99	0.43	0.90	-0.5

These two states saw a very large increase in SAT participation rates and a corresponding decrease in ACT participation rates. This is due to College Board's partnership with both Illinois and Colorado to administer the SAT as the state's accountability exam.

> Illinois moves ahead with new testing plan, replacing ACT with SAT (Chicago Tribune, 2016)
> Colorado juniors face new, revamped college exam in SAT after state dumps rival ACT (Denver Post, 2017)

Before this, the ACT held the statewide contract for these two states, which explains the high ACT participation rates in 2017. With each state covering the cost of the SAT and making it mandatory for high school juniors, the increase in participation and corresponding decrease is natural.

Conclusions & Recommendations

SAT Familiarity and Traction

We should consider states with low SAT participation rates but also look at the existing SAT participation to gauge the traction that the SAT already has in that state, to make our efforts efficient. For example, Illinois and Colorado already had SAT participation rates of around 10% in 2017.

High Potential States

The states with the most potential for growth in participation rates are states who **already mandate the ACT test**, and hence the College Board should work on lobbying these states to switch to the SAT as their state accountability test, for example Ohio, which has a SAT participation rate of 16% in 2018 The population size is also relatively large at 11.6M and it is the 7th most populous state in the United States

Conclusions & Recommendations

Short-Term Plans

Depending on the state's contract with ACT, it may take a few years for lobbying efforts to see fruition, and in the short-term, the College Board can also consider approaching states that do not have a contract with either SAT or ACT, as they would be able to implement it quicker. One good candidate would be California, the most populous state in the United States with a population of 39M. It already has a relatively high participation rate in the SAT of 60%, indicating that there would be enough traction in the state for the test.

It already has a relatively high participation rate in the SAT of 56%, indicating that there would be enough traction in the state for the test.

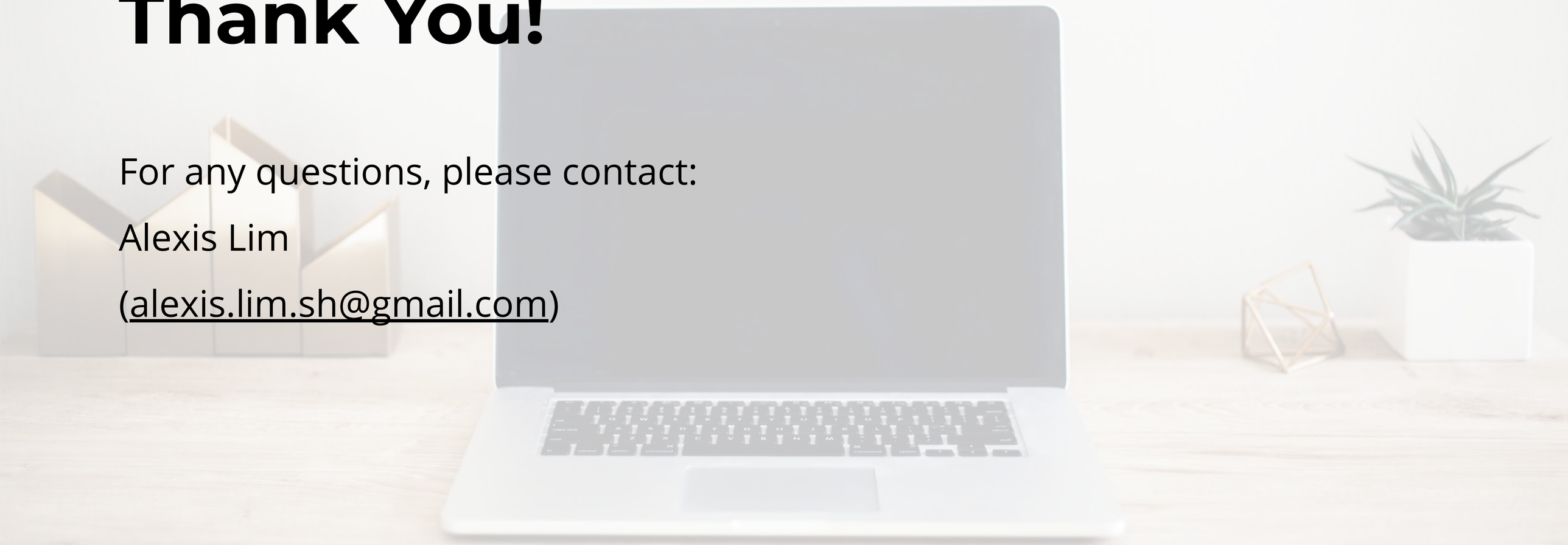
Conclusions & Recommendations

Additional Exploration

Further exploration and data analysis on the topic would be more informed with more datasets, including but not limited to:

- Categorical variable on state policies toward standardized testing (e.g. Mandates testing: Yes/No; which state-administered test if any)
- Data from preceding and subsequent years such that we could examine a trend in the data over time.
- More granular data at the county or school-level that would have allowed us more data points to examine the trends in test scores and participation rates.

Thank You!



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