DSI-26: Project 1

Strategy / Proposal towards College Board to boost SAT participation

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The problem

Company

College Board is looking for ways to boost test participation rates across the United States

Context

Test participation is an important profitability metric because it builds College Board's student database; this drives revenue linked to leasing such data to colleges and scholarship programs

Problem statement

Tracking statewide participation, recommend which state(s) should be prioritized to boost SAT participation rates.

Proposal

Pennsylvania, Vermont, and Virgina seem to be promising targets

WHY? Low hanging fruit:

- ~10% of 2019 potential test-takers in these states did not take either the ACT or the SAT, and
- over 50% of 2019 the test-taking population in these states already favour the SAT

Peer group targeting may make for a good marketing tactic.

Data and Analyses

Wind in College Board's favour (2017 to 2019 policy trend)

Observation: States with 100% participation decreasing for ACT and increasing for SAT

We see, over time, while there were more states having 100% participation rates in the ACT initially, the number of states with 100% SAT participation rates grew from 4 to 8, while that of the ACT dropped from 17 to 15 over the same years.

In [ ]:
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1
```

In [77]:
```
1 # Looking for participation rates that are 100%
2 df_cleaned.mask(df_cleaned != 1).sum()[0:6]
```

Out[77]:
```
participation_act_2017    17.0
participation_act_2018    17.0
participation_act_2019    15.0
participation_sat_2017     4.0
participation_sat_2018     5.0
participation_sat_2019     8.0
dtype: float64
```

States with y-o-y participation rate changes more than +10% for the SAT

Out[60]:

state	Colorado	Florida	Illinois	New Jersey	New York	Oklahoma	Rhode Island	South Carolina	West Virginia
participation_act_2017_to_2018	-0.70	-0.07	-0.50	-0.03	-0.04	0.00	-0.06	0.00	-0.04
participation_act_2018_to_2019	-0.03	-0.12	-0.08	-0.06	-0.05	0.00	-0.03	-0.22	-0.16
participation_sat_2017_to_2018	0.89	-0.27	0.90	0.12	0.12	0.01	0.26	0.05	0.14
participation_sat_2018_to_2019	0.00	0.44	0.01	0.00	0.00	0.14	0.03	0.13	0.71

Wind in College Board's favour (states moving towards SAT)

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States with >60% participation in at least one year for the ACT, and at least one year for the SAT
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Out[57]:

state	Colorado	Florida	Illinois	South Carolina	West Virginia
participation_act_2017	1.00	0.73	0.93	1.00	0.69
participation_act_2018	0.30	0.66	0.43	1.00	0.65
participation_act_2019	0.27	0.54	0.35	0.78	0.49
participation_sat_2017	0.11	0.83	0.09	0.50	0.14
participation_sat_2018	1.00	0.56	0.99	0.55	0.28
participation_sat_2019	1.00	1.00	1.00	0.68	0.99

- From the above, we see that Colorado flipped from to SAT between 2017 and 2018 and remained with the SAT in 2019.
- Florida and Illinois show a similar trend.
- South Carolina shows signs of moving towards the SAT as well, and indeed no longer had 100% ACT participation in 2019 (dropped from 100% in 2017 and 2018).
- West Virginia has also moved towards the SAT, although it never had 100% ACT participation rates either in 2017. As understood from external research, this state has a separate test outside the ACT and SAT as an alternative to either test.

Targeted states: “growth” to be captured

Out[64]:

state	Pennsylvania	Vermont	Virginia	California
participation_act_2017	0.23	0.29	0.29	0.31
participation_act_2018	0.20	0.24	0.24	0.27
participation_act_2019	0.17	0.20	0.21	0.23
participation_sat_2017	0.65	0.60	0.65	0.53
participation_sat_2018	0.70	0.64	0.68	0.60
participation_sat_2019	0.70	0.66	0.68	0.63

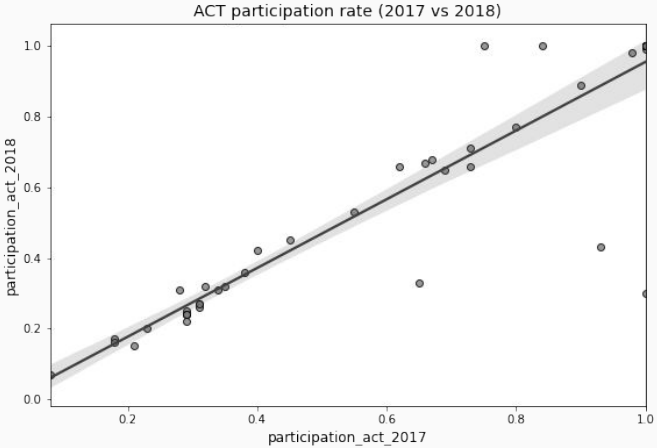
Pennsylvania, Vermont, Virgina and California have less than 90% of 2019 potential test-takers taking either ACT of SAT, and also have more than 50% of 2019 test-takers already taking the SAT.

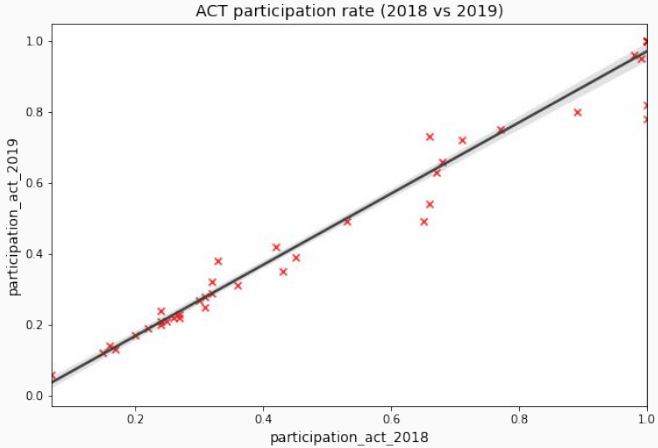
These are potentially states that have test-takers to capture as part of a **growth** strategy.

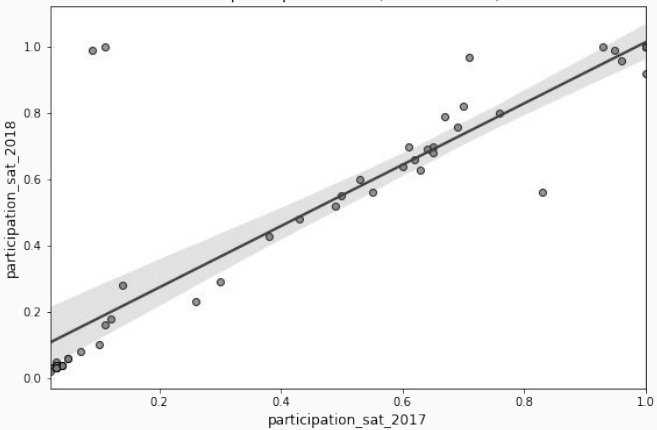
We note that this may also be a sign that standardized tests in general are less popular, which is likely the case for California, so qualitatively we should filter out such states.

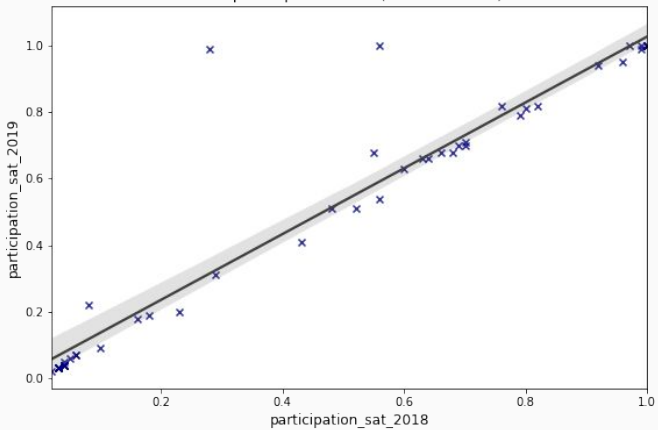
Nonetheless, **Pennsylvania, Vermont and Virginia look like promising targets for College Board to refocus efforts and grow SAT participation rates**.

Year-on-year participation rates (positive correlation)

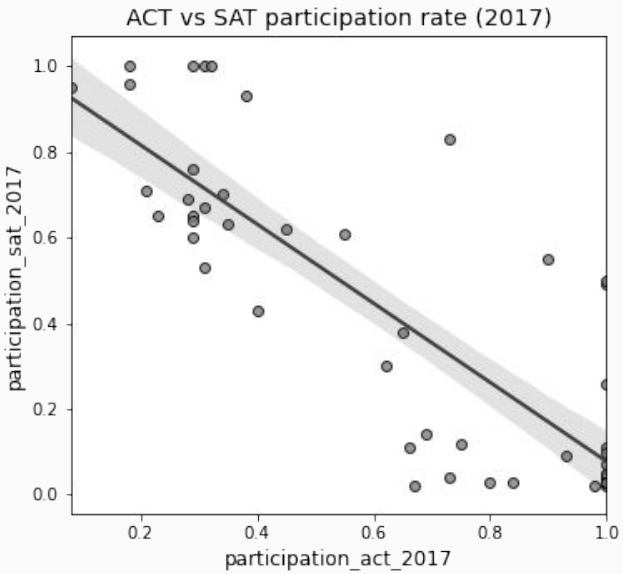


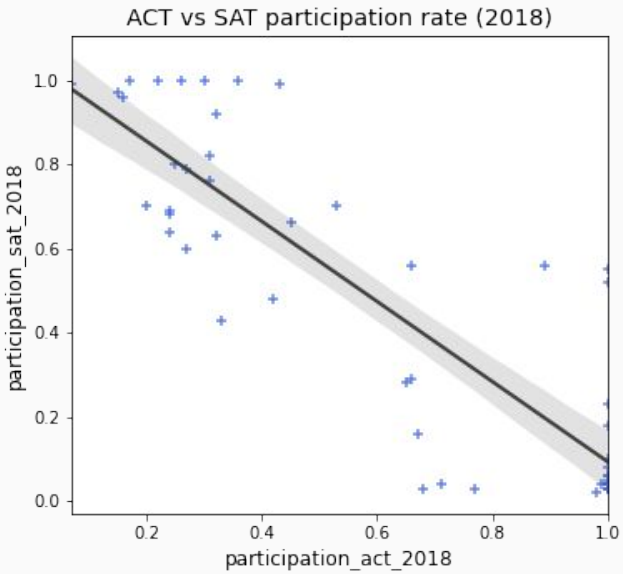


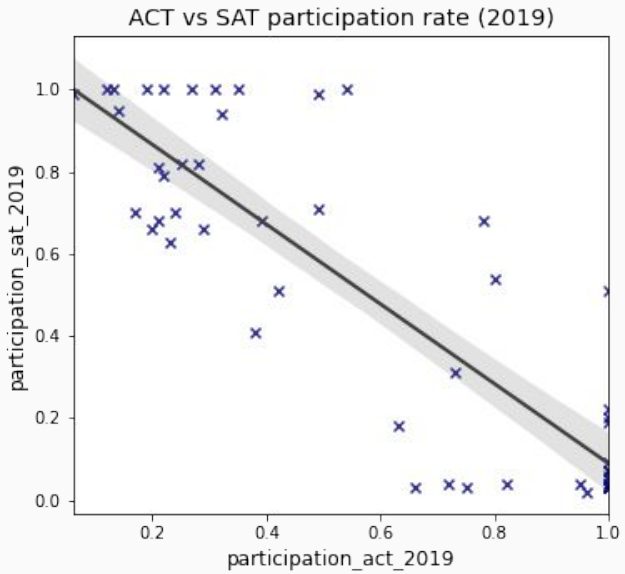


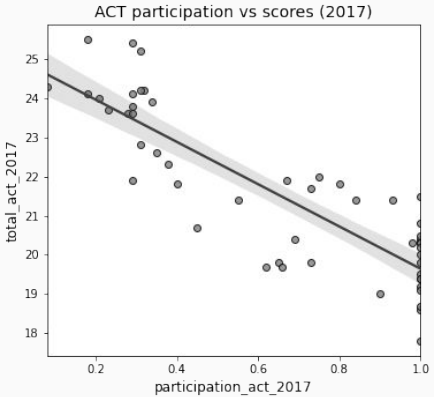


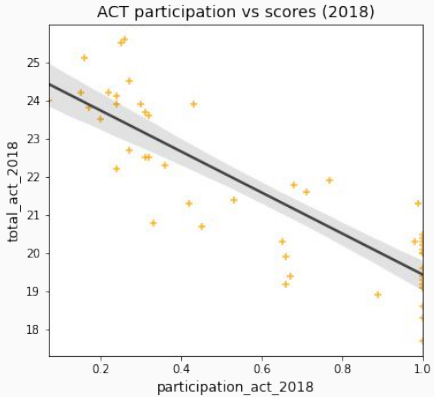
ACT vs. SAT participation rates (negative correlation)

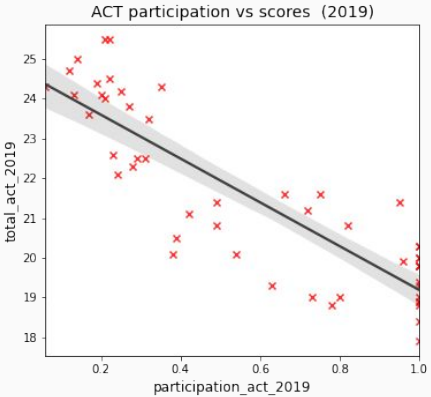








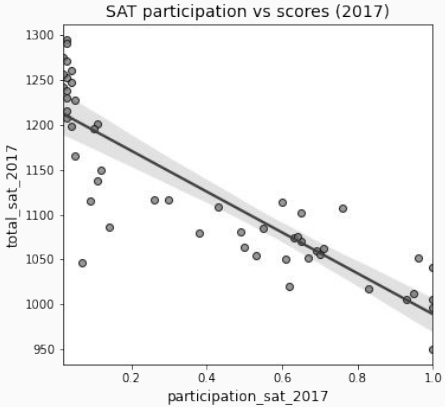


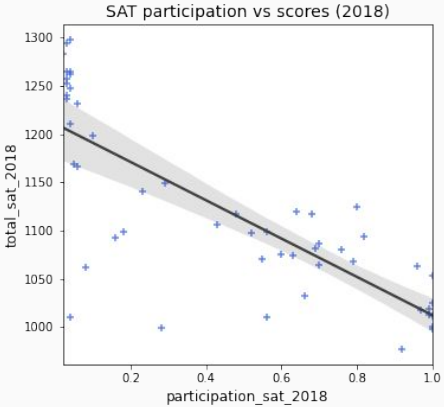


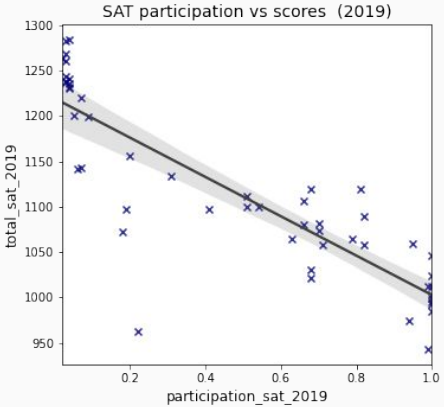
Negative correlation between participation and scores for both tests

Use as a marketing tactic when competing with ACT via student/test-take peers

(ACT state averages in pro-ACT states tend to be lower)







Conclusion

Pennsylvania, Vermont, and Virgina are our target states

More generally, a three-pronged strategy:

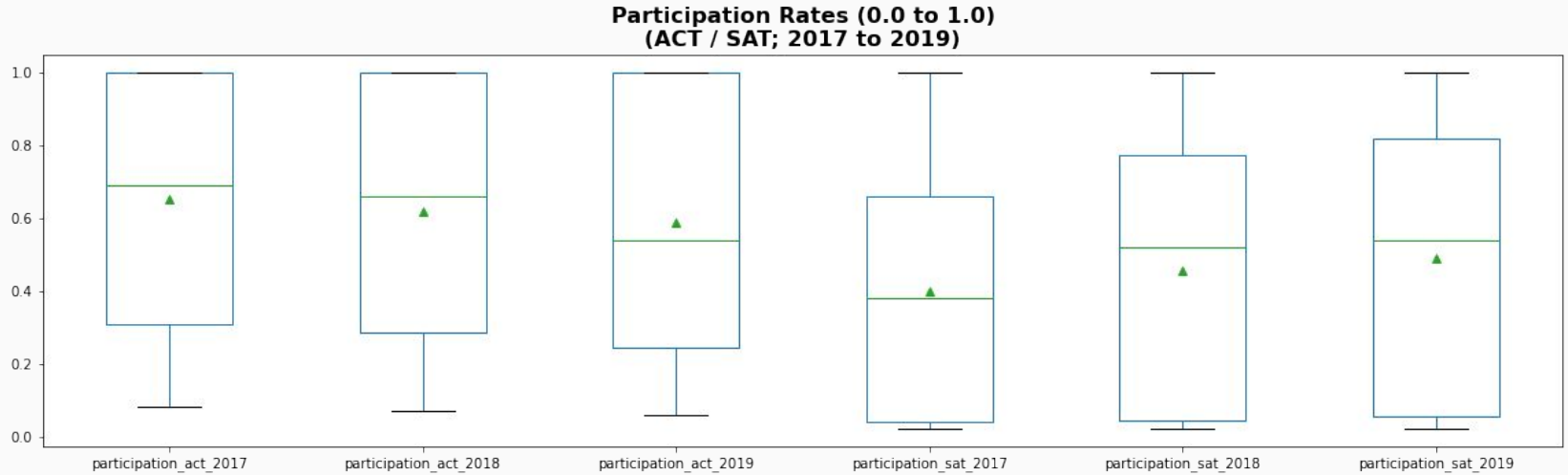
(1) **grow** overall participation rate in states with less than 90% test participation rates,

(2) **defend** existing market share, and

(3) **repeating past successes** (converting states from ACT to SAT).

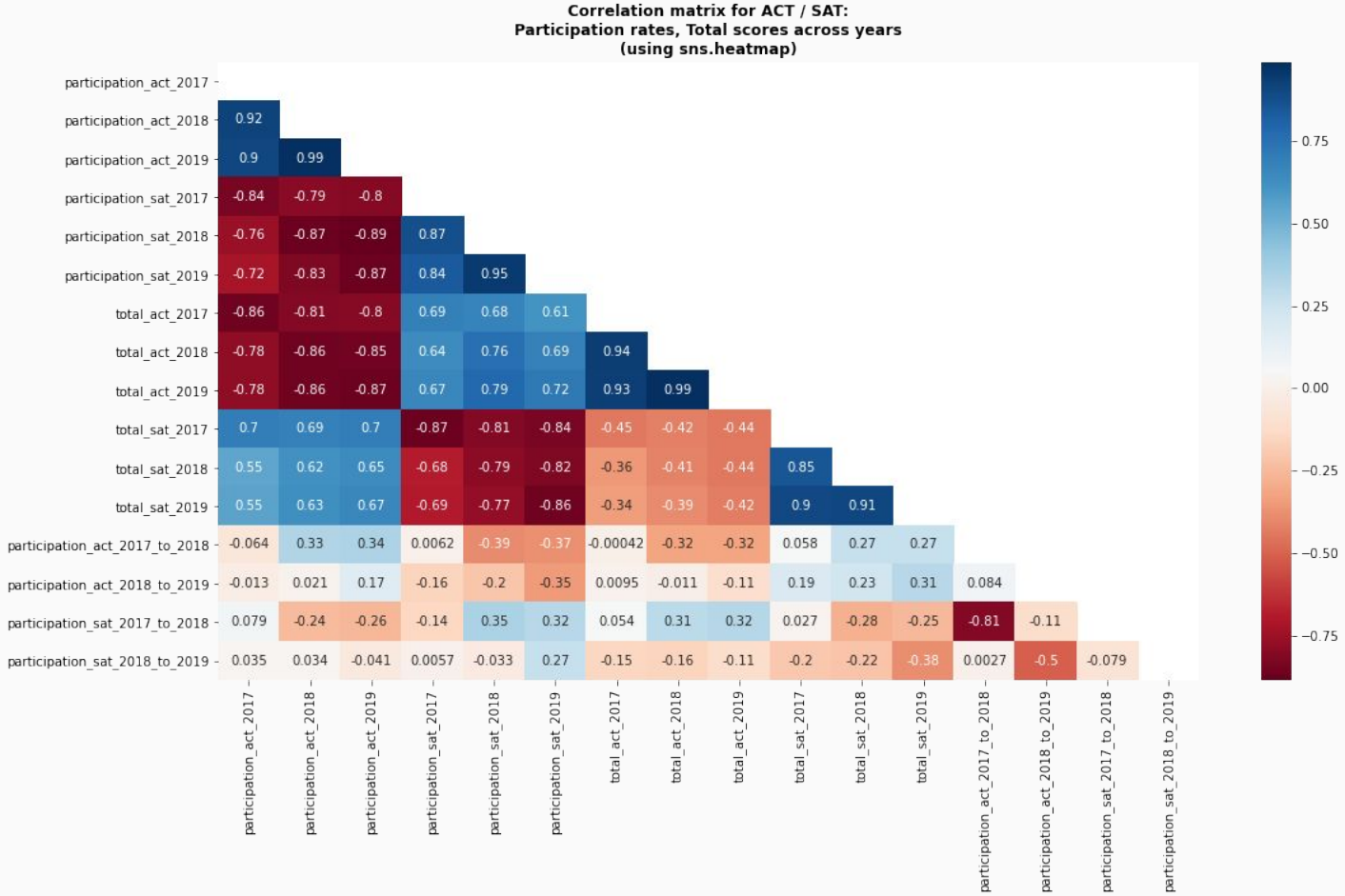
Back-up / Additional Graphics

Boxplots of participation rates per test per year (state count = 51)

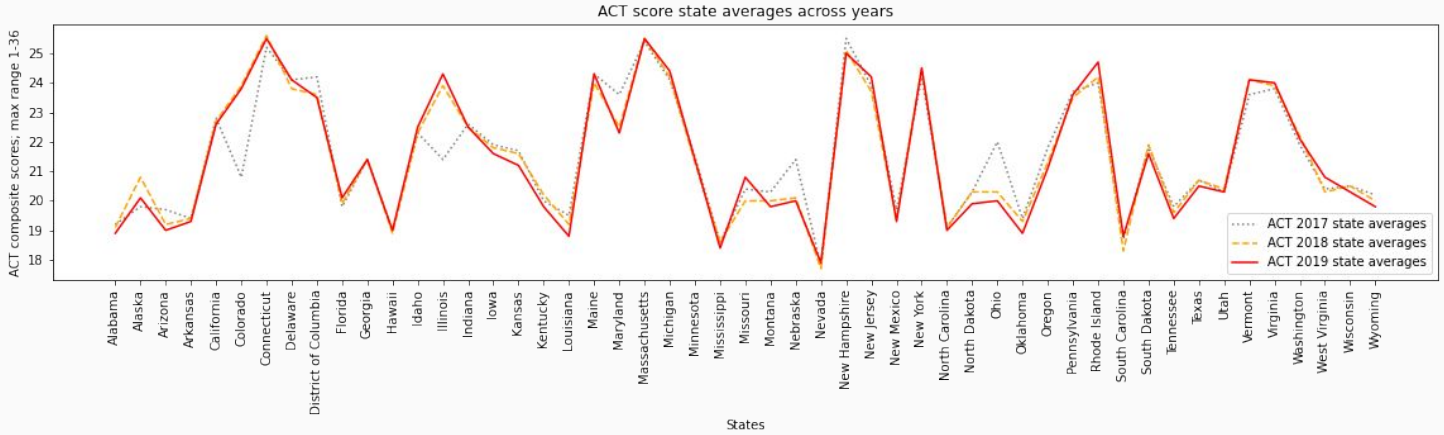


1. Means hover around ~60% for ACT and ~40% for SAT
2. ACTs generally have a higher median as well
3. Room to grow for SAT / College Board

Correlations providing interesting ways to examine data by cluster



Note the negative correlation between test scoring averages and their respective participation rates



ACT state averages (scores) appear “stickier” than SAT averages