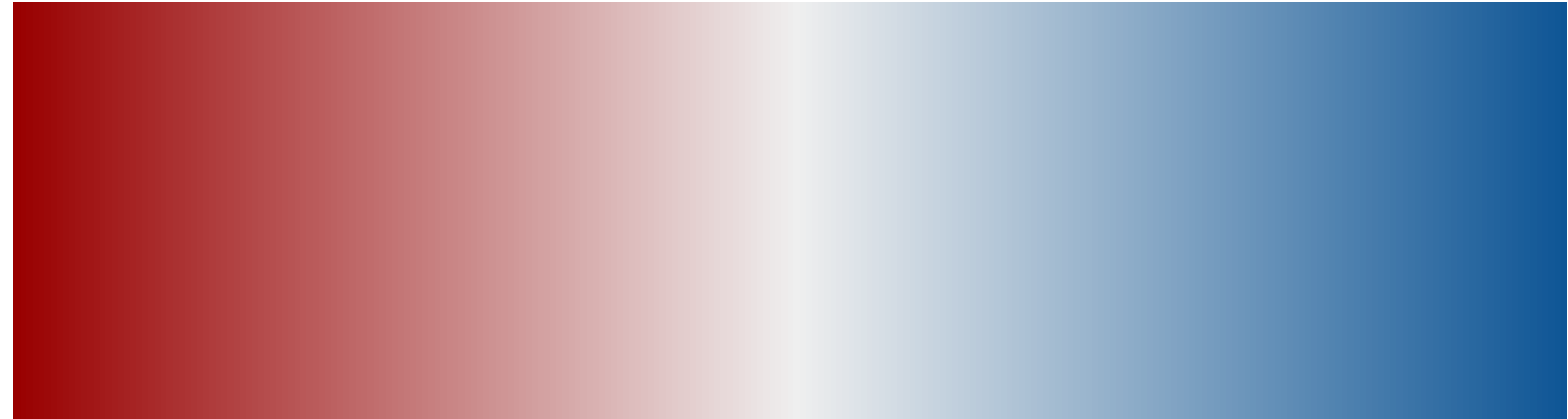


Standardized Test Analysis

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Project objectives:

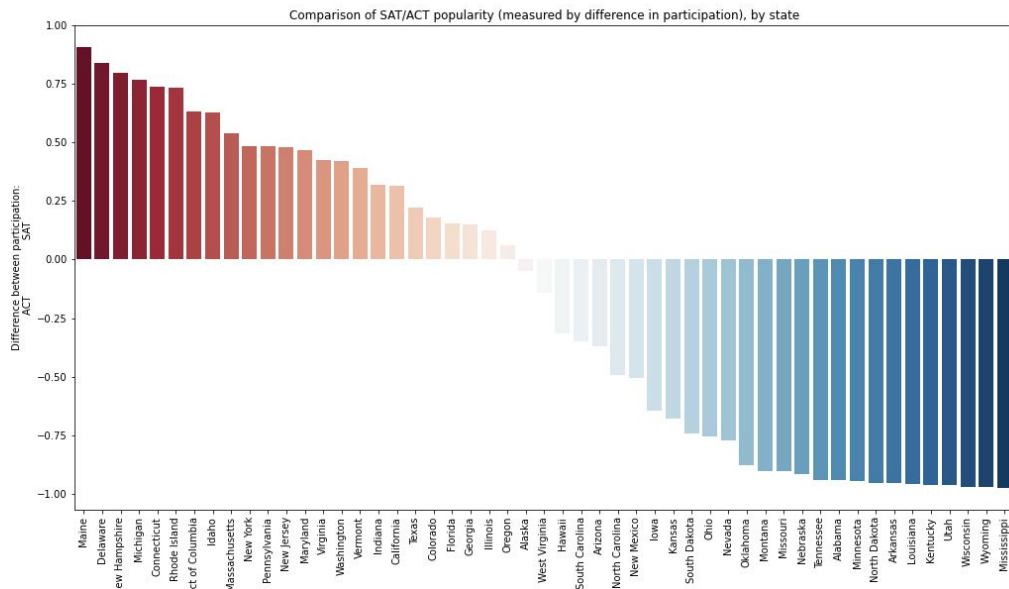
1. Assess feasibility of converging onto one standard (either only SAT or only ACT)
2. Evaluate if one of the tests can be generally considered easier than the other
3. Determine if either the SAT or the ACT is better for “elite school”* candidates

*For the purpose of this project, “[elite schools](#)” are defined as those which are popular (high # of applicants) and selective (low acceptance rate)

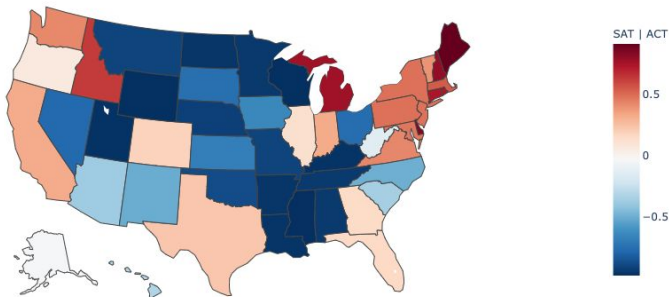
Data used in project:

- SAT participation and average scores, by state (years 2017-2019)
- ACT participation and average scores, by state (years 2017-2019)
- Number of applications, acceptance rates, and typical ranges of SAT / ACT scores for students accepted to 400+ US colleges

Could all states adopt just ONE standard?



Comparison of SAT/ACT popularity (measured by difference in participation), by state



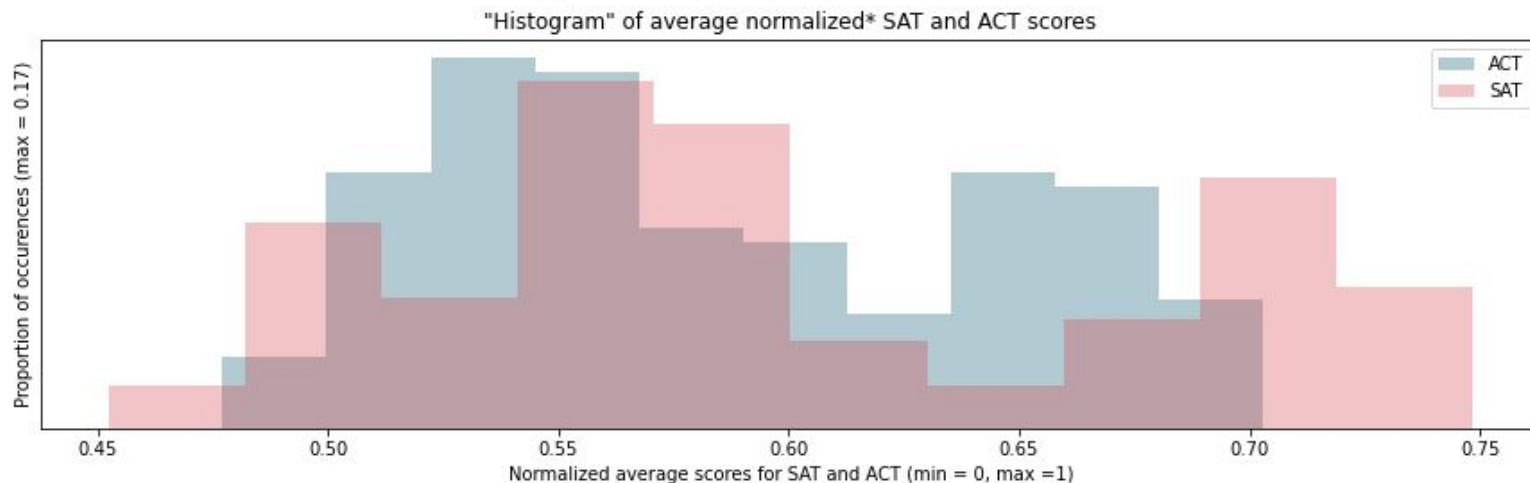
While both tests are available to students in all states, some states seem to overwhelmingly "prefer" one over the other:

- SAT is more popular by over 50 p.p. in 9 states
- ACT is more popular by over 50 p.p. in 21 states
- There are 24 states where one of the tests (SAT or ACT) is more popular than the other by more than 70 pct points;
 - Of these 24 states, 18 could accept ACT as the only standard test and 6 could standardize on SAT

Although some states are very close to using almost exclusively either the SAT or the ACT, transitioning to just one standard across the US doesn't currently seem feasible.

Is one of the tests easier?

Are results generally better for either ACT or SAT?

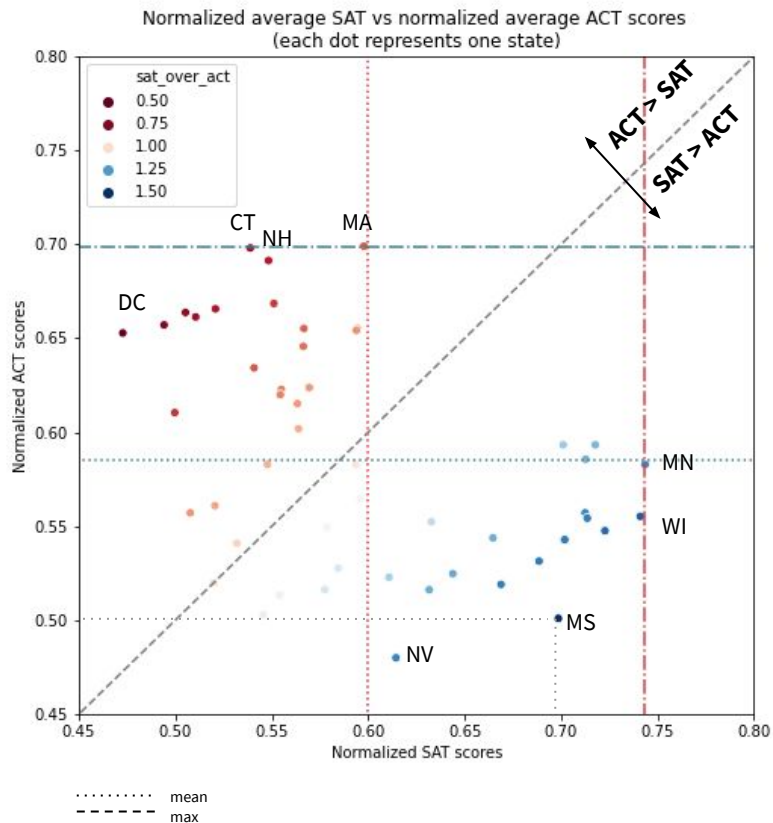


- The SAT results are more widely distributed - average normalized ACT results range from 0.48 to 0.70, SAT results - from 0.45 to 0.74
- Both distributions appear to have several modes, with a sizeable group of students achieving results between 0.52 and 0.56 and a smaller but distinct group of students achieving scoring between 0.63 and 0.68 for the ACT and between 0.68 and 0.72 for the SAT.

The differences in distribution of SAT vs ACT results don't clearly point to one of the two being "easier"

* Because the ranges of possible scores for the SAT and the ACT are different, in order to allow for direct comparisons between the tests' results, both tests' scores were normalized and expressed on a scale of 0 to 1 (min-max method)

Is one of the tests easier?

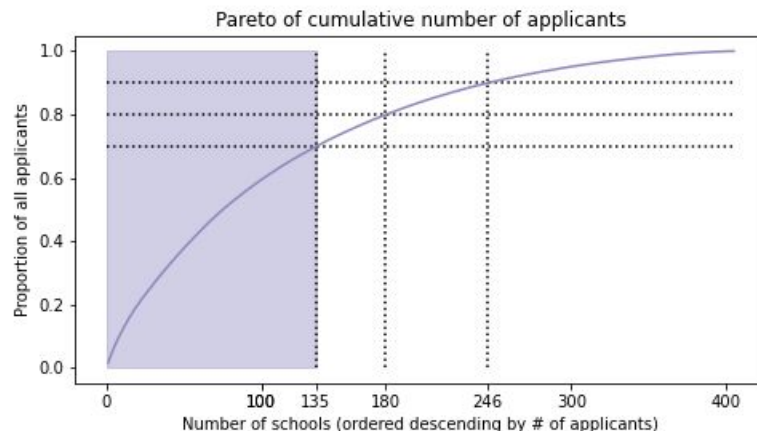
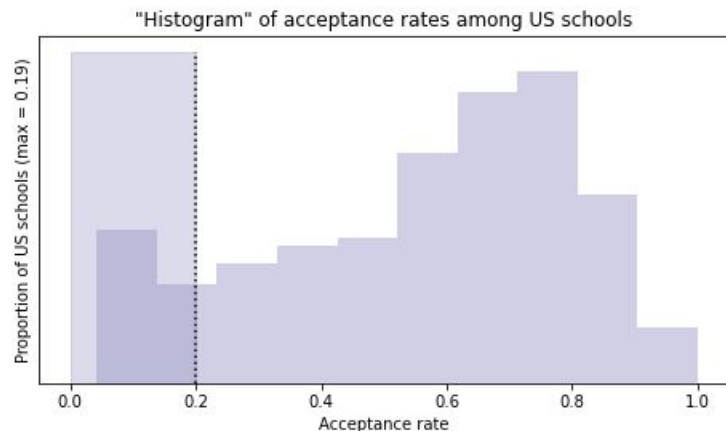


- The points representing individual states are spread nearly evenly between the ACT > SAT area (top-left) and the SAT > ACT area (bottom-right)*,
- However:
 - 27 states report better SAT results, 24 - better ACT results
 - The mean score for the SAT is slightly higher: ~0.6 vs ~0.59 for the ACT
 - while some states average up to 0.74, for the normalized SAT scores, normalized ACT scores do not exceed 0.7

Approximately the same numbers of states had students historically perform better on the SAT as on the ACT

*No significant differences or trends were observed when analysis was performed separately for 2017, 2018, and 2019

Which schools were considered “elite”?

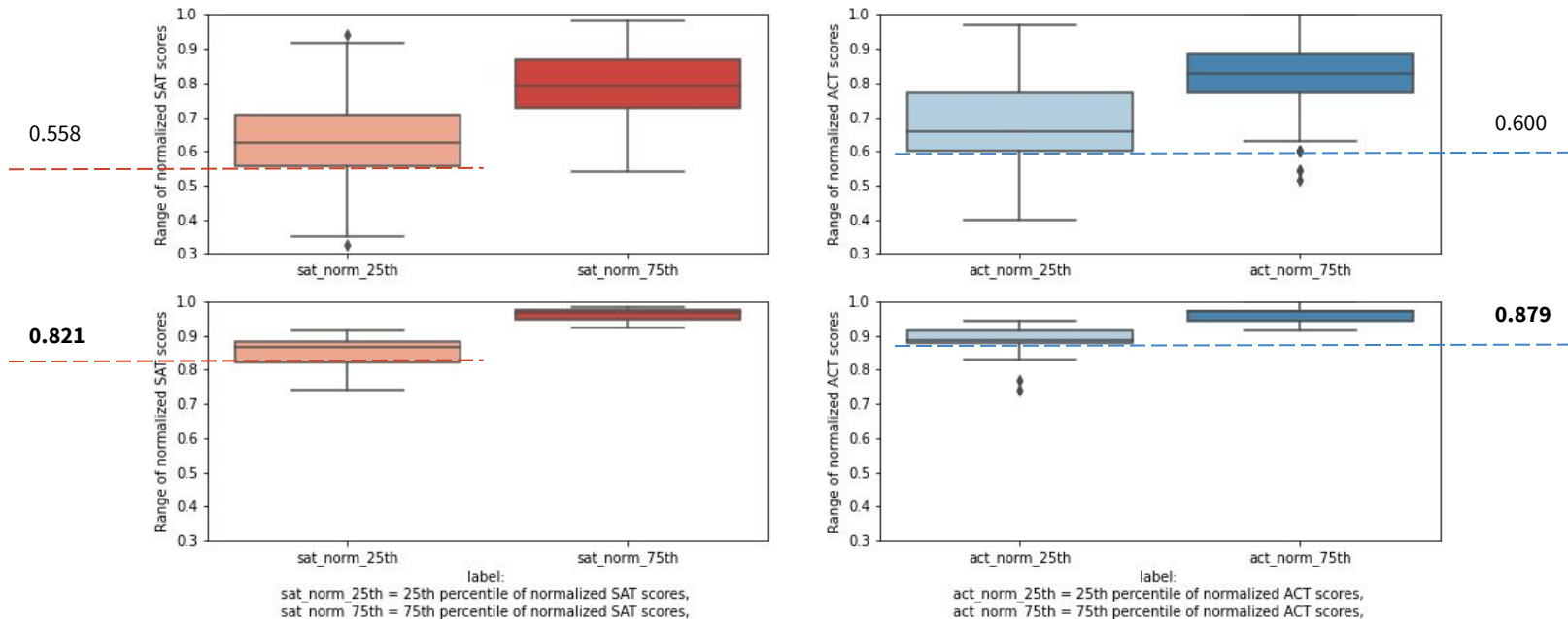


28 schools are both highly selective (acceptance rate < 20%) and very popular with students (most received applications):

- Brown University,
- Carnegie Mellon University,
- Columbia University,
- Cornell University,
- Dartmouth College,
- Duke University,
- Emory University,
- Georgetown University,
- Harvard College,
- Johns Hopkins University,
- Massachusetts Institute of Technology,
- New York University,
- Northeastern University,
- Northwestern University,
- Princeton University,
- Rice University,
- Stanford University,
- Tufts University,
- Tulane University,
- University of California - Berkeley,
- University of California - Los Angeles,
- University of Chicago,
- University of Notre Dame,
- University of Pennsylvania,
- University of Southern California,
- Vanderbilt University,
- Washington University in St. Louis,
- Yale University

Required scores: all schools vs “elite” schools

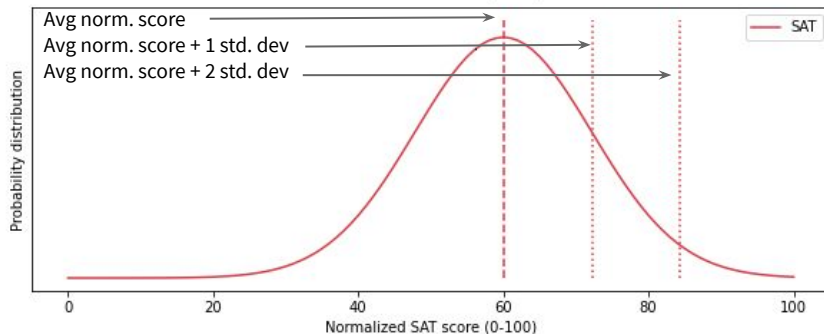
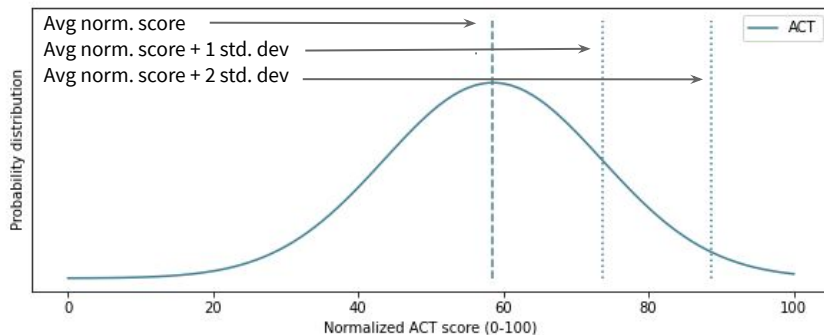
Distribution of SAT / ACT scores typical for students accepted to all US colleges (upper)
vs US colleges classified as “elite schools” (lower)



- Getting into a US college typically requires an SAT score $\geq 55.8\%$ (960.0 points), or ACT score $\geq 60.0\%$ or 21.6 points
- Getting into one of the “elite” schools typically requires an SAT score $\geq 82.1\%$ (1405.7 points), or ACT score $\geq 87.9\%$ or 31.6 points

So, is either the SAT or the ACT “better”?

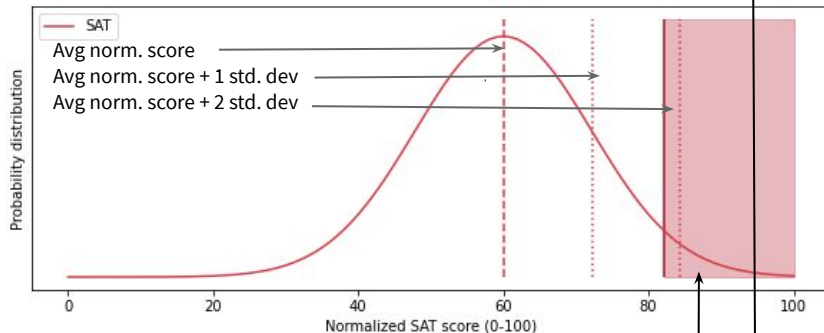
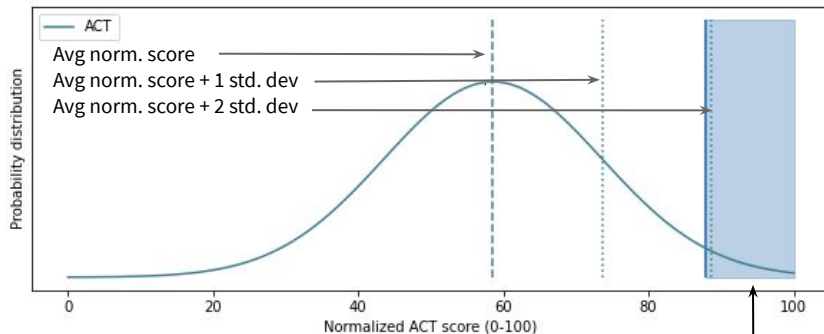
Approx. distribution of normalized ACT scores (top) & SAT scores (bottom)



- *Individual test scores are normally distributed*
- The mean score for the SAT is slightly higher: ~0.6 vs ~0.59 for the ACT
- The standard deviation of SAT results is 0.12 (195 points) vs 0.15 (5.4 point) for the ACT
- Getting into one of the “elite” schools typically requires an SAT score equivalent to at least **82.1%** or ACT score equivalent to at least **87.9%**

So, is either the SAT or the ACT “better”?

Approx. distribution of normalized ACT scores (top) & SAT scores (bottom)
vs corresponding college acceptance “minimum”



Typical range of scores typical for students
accepted to “elite schools” (shaded area)

- Individual test scores are normally distributed
- The mean score for the SAT is slightly higher: ~0.6 vs ~0.59 for the ACT
- The standard deviation of SAT results is 0.12 (195 points) vs 0.15 (5.4 point) for the ACT
- Getting into one of the “elite” schools typically requires an SAT score equivalent to at least **82.1%** or ACT score equivalent to at least **87.9%**

The probability of a high school student scoring enough points on the SAT to get into an 'elite school' is 3.5%, compared to 2.6% for ACT...
... which is a relative difference of almost 26%!

In summary:

1. Transitioning to just one standard across the US doesn't currently seem feasible.
2. The differences in distribution of SAT vs ACT results don't clearly point to one of the two being easier.
3. The SAT offers a higher probability of getting accepted to an “elite school” than the ACT.