



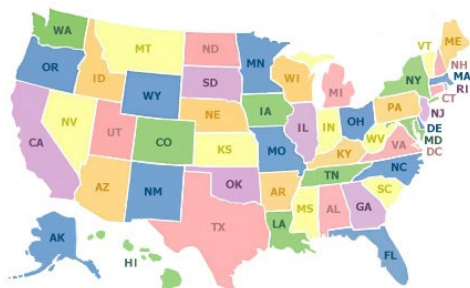
# SAT / ACT Prep Online Guides and Tips

## Average SAT & ACT Scores by State (Participation Adjusted)



Posted by [Dr. Fred Zhang](#) | Mar 6, 2016 9:00:00 AM

[SAT STRATEGIES](#), [ACT STRATEGIES](#)



Participation rate has a huge impact on state average SAT / ACT scores. In any state, the top students on the SAT/ACT are those most eager to take it, so states with low participation rates have artificially higher SAT / ACT scores. Here, we use advanced statistical methods to adjust for participation rate to get at the **real ranking** of states by their real SAT and ACT scores.

Both the SAT and the ACT test makers have released data on raw average SAT and ACT scores by state. However, you cannot rely on raw average scores because **these averages are biased by participation rates**. The lowest participating states tend to send primarily their best students and have the highest scores. This results in bias. We have used advanced, robust statistical methods to adjust for participation rate to get at the real, underlying, normed average SAT and ACT scores by state. This adjustment in the technical literature is also known as "controlling" or "norming". Here are the adjusted scores:

### States Ranked by Average SAT Scores, Adjusted

Rank	State	Average SAT Score, Adjusted	Average New SAT	Raw Average	Participation Rate

			Score, Adjusted	SAT Score	
1	Massachusetts	1694	<b>1130</b>	1556	84%
2	Connecticut	1690	<b>1126</b>	1525	88%
3	Minnesota	1660	<b>1107</b>	1786	6%
4	New Jersey	1655	<b>1104</b>	1526	79%
5	Illinois	1652	<b>1101</b>	1802	5%
6	New Hampshire	1651	<b>1101</b>	1566	70%
7	North Dakota	1649	<b>1099</b>	1816	2%
8	Virginia	1648	<b>1099</b>	1530	73%
9	South Dakota	1648	<b>1099</b>	1792	3%
10	Iowa	1648	<b>1098</b>	1794	3%
11	Wisconsin	1644	<b>1096</b>	1782	4%
12	Vermont	1640	<b>1093</b>	1554	63%
13	Colorado	1635	<b>1090</b>	1735	14%
14	Missouri	1633	<b>1089</b>	1771	4%
15	Michigan	1628	<b>1086</b>	1784	4%
16	Kansas	1621	<b>1081</b>	1753	5%
17	Georgia	1620	<b>1080</b>	1445	77%
18	Indiana	1612	<b>1075</b>	1474	71%
19	Florida	1609	<b>1073</b>	1448	72%
20	Nebraska	1604	<b>1070</b>	1745	4%
21	Wyoming	1600	<b>1067</b>	1762	3%
22	Kentucky	1596	<b>1064</b>	1746	5%
23	New York	1593	<b>1062</b>	1468	76%
24	North Carolina	1592	<b>1062</b>	1483	64%
25	Oregon	1587	<b>1058</b>	1544	48%
26	Maryland	1586	<b>1057</b>	1468	78%
27	Washington	1585	<b>1057</b>	1519	63%
28	Idaho	1585	<b>1056</b>	1364	100%
29	South Carolina	1584	<b>1056</b>	1443	65%
30	Hawaii	1584	<b>1056</b>	1460	63%
31	Tennessee	1581	<b>1054</b>	1714	8%
32	California	1579	<b>1053</b>	1504	60%

33	Ohio	1577	<b>1051</b>	1652	15%
34	Arizona	1568	<b>1045</b>	1547	36%
35	Pennsylvania	1567	<b>1044</b>	1481	71%
36	Oklahoma	1565	<b>1043</b>	1697	5%
37	Rhode Island	1563	<b>1042</b>	1480	73%
38	Montana	1558	<b>1039</b>	1637	18%
39	Alaska	1555	<b>1037</b>	1485	54%
40	Mississippi	1552	<b>1035</b>	1714	3%
41	Arkansas	1551	<b>1034</b>	1698	4%
42	Utah	1540	<b>1027</b>	1690	5%
43	Texas	1539	<b>1026</b>	1432	62%
44	Nevada	1526	<b>1017</b>	1458	54%
45	New Mexico	1524	<b>1016</b>	1617	12%
46	Delaware	1522	<b>1015</b>	1359	100%
47	District of Columbia	1518	<b>1012</b>	1309	100%
48	Louisiana	1517	<b>1011</b>	1667	5%
49	Maine	1511	<b>1008</b>	1387	96%
50	Alabama	1496	<b>998</b>	1617	7%
51	West Virginia	1444	<b>963</b>	1522	15%

*Each state is listed with its SAT score adjusted for (controlled for) participation rate. Other columns include the rank of the normed SAT score, the new SAT conversion, the raw SAT score, and the participation rate.*

The top two states for normed SAT scores are Massachusetts and Connecticut. This isn't a surprise. Both states have relatively large education budgets. Massachusetts (home state of PrepScholar) and Connecticut have some of the best colleges in the USA, and both have a strong emphasis on high school education and test prep. The bottom two states are Alabama and West Virginia. The spread between the top and bottom is more than a whopping 250 points -- around the same improvement our [PrepScholar Online Prep program](#) guarantees.

## States Ranked by Average ACT Scores, Adjusted

Rank	State	Average ACT Score, Adjusted	Raw Average	Participation Rate
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			<b>ACT Score</b>	
1	Minnesota	<b>23.04</b>	22.9	76%
2	Connecticut	<b>22.93</b>	24.2	29%
3	Massachusetts	<b>22.72</b>	24.3	23%
4	New Hampshire	<b>22.63</b>	24.2	20%
5	Ohio	<b>22.47</b>	22	72%
6	Montana	<b>22.42</b>	20.5	100%
7	Vermont	<b>22.32</b>	23.2	29%
8	Colorado	<b>22.31</b>	20.6	100%
9	New York	<b>22.27</b>	23.4	27%
10	Nebraska	<b>22.20</b>	21.7	86%
11	Wisconsin	<b>22.04</b>	22.2	73%
12	Kansas	<b>22.02</b>	22	75%
13	Utah	<b>21.97</b>	20.8	100%
14	South Dakota	<b>21.93</b>	21.9	78%
15	Illinois	<b>21.87</b>	20.7	100%
16	Missouri	<b>21.80</b>	21.8	76%
17	North Carolina	<b>21.79</b>	18.9	100%
18	Virginia	<b>21.79</b>	22.8	28%
19	New Jersey	<b>21.78</b>	23.1	25%
20	Indiana	<b>21.73</b>	21.9	40%
21	Idaho	<b>21.71</b>	22.4	45%
22	Florida	<b>21.66</b>	19.6	81%
23	Washington	<b>21.60</b>	23	22%
24	North Dakota	<b>21.57</b>	20.6	100%
25	Iowa	<b>21.49</b>	22	68%
26	California	<b>21.41</b>	22.3	29%
27	South Carolina	<b>21.37</b>	20.4	58%
28	Georgia	<b>21.34</b>	20.8	53%
29	Arkansas	<b>21.21</b>	20.4	93%
30	Michigan	<b>21.21</b>	20.1	100%
31	Tennessee	<b>21.16</b>	19.8	100%
32	Wyoming	<b>21.14</b>	20.1	100%
33	Maryland	<b>21.07</b>	22.6	22%

34	Kentucky	<b>21.07</b>	19.9	100%
35	Pennsylvania	<b>21.04</b>	22.7	19%
36	Alabama	<b>21.01</b>	20.6	80%
37	Rhode Island	<b>20.99</b>	22.9	16%
38	Oregon	<b>20.88</b>	21.4	36%
39	Texas	<b>20.78</b>	20.9	40%
40	Nevada	<b>20.76</b>	21.2	36%
41	Hawaii	<b>20.73</b>	18.2	90%
42	Oklahoma	<b>20.72</b>	20.7	75%
43	Delaware	<b>20.69</b>	23.2	18%
44	West Virginia	<b>20.69</b>	20.6	65%
45	Alaska	<b>20.63</b>	21	37%
46	Maine	<b>20.56</b>	23.6	9%
47	District of Columbia	<b>20.41</b>	21.6	37%
48	Louisiana	<b>20.37</b>	19.2	100%
49	Arizona	<b>20.12</b>	19.7	55%
50	Mississippi	<b>20.04</b>	19	100%
51	New Mexico	<b>20.04</b>	19.9	69%

*Each state is listed with its ACT score adjusted for (controlled for) participation rate. Other columns include the rank of the normed ACT score, the raw average ACT score, and the participation rate.*

The top states are Minnesota, another state renowned for its education, and Connecticut (also on the top SAT scores list). The bottom states on this normed ACT list are Mississippi and New Mexico.

We've presented our results first because we know that's what most people are looking for. However, it's important to understand why average SAT / ACT scores are important, why adjusting is critical, and how we did the norming. Below, we get into those details.

## Why Are Average SAT / ACT Scores by State Important?

For some, knowing state average test scores is fun trivia: my state is the best and smartest.

But for many students and parents, **knowing state average SAT / ACT scores can be critical**. For students applying for scholarships, many scholarships are more competitive in "smarter" states. For students who want to compare themselves to their in-state peers, the scores above are also very useful. For families thinking of moving states, they may want to make sure their target state has a good education system. For researchers and education designers, this data helps them see which state systems are working and which ones may be failing.

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## Why Is Adjusting (aka Controlling, or Norming) Needed?

**You absolutely cannot rely on raw average SAT / ACT scores to gauge state performance!** This is because raw SAT / ACT scores are terribly confounded with participation rates. The reason is simple. Let's look at the SAT. The best SAT students in any state tend to be the most aggressive about wanting to take the test (after all, it shows them in a good light).

Therefore, if a state's SAT participation is low, the state will only have the best students taking it, **making the score artificially high**. Likewise, if a state requires the SAT, it will have 100% participation but also include the worst SAT takers, making the score artificially low.

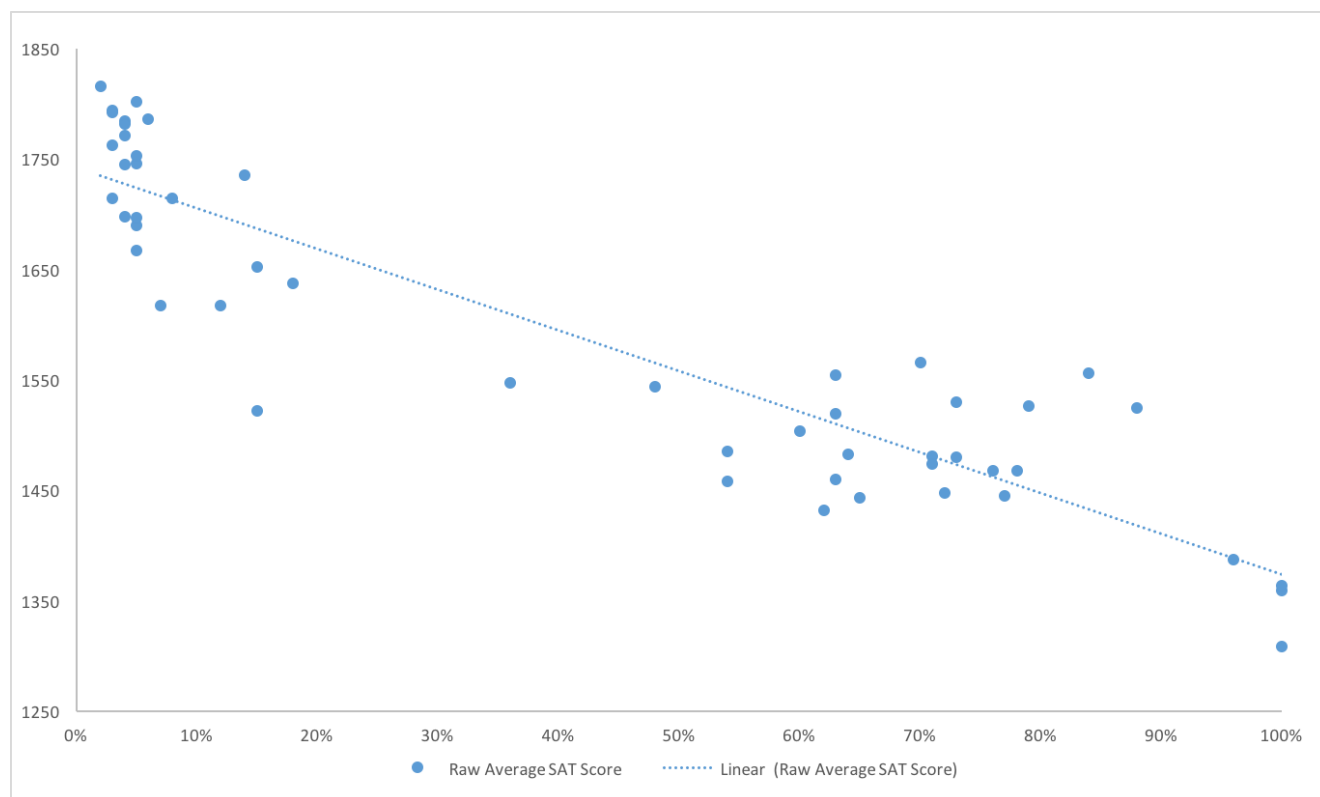
In fact, the highest raw SAT state is North Dakota, which also has the flimsiest participation at 2%. Because the participation rate is so low, that means few, if any, schools in North Dakota require the SAT, so the only people who take it are those who

really want to and went out of their way to take the test. These people likely studied for the SAT, are naturally good at the SAT, and can expect to do better than average.

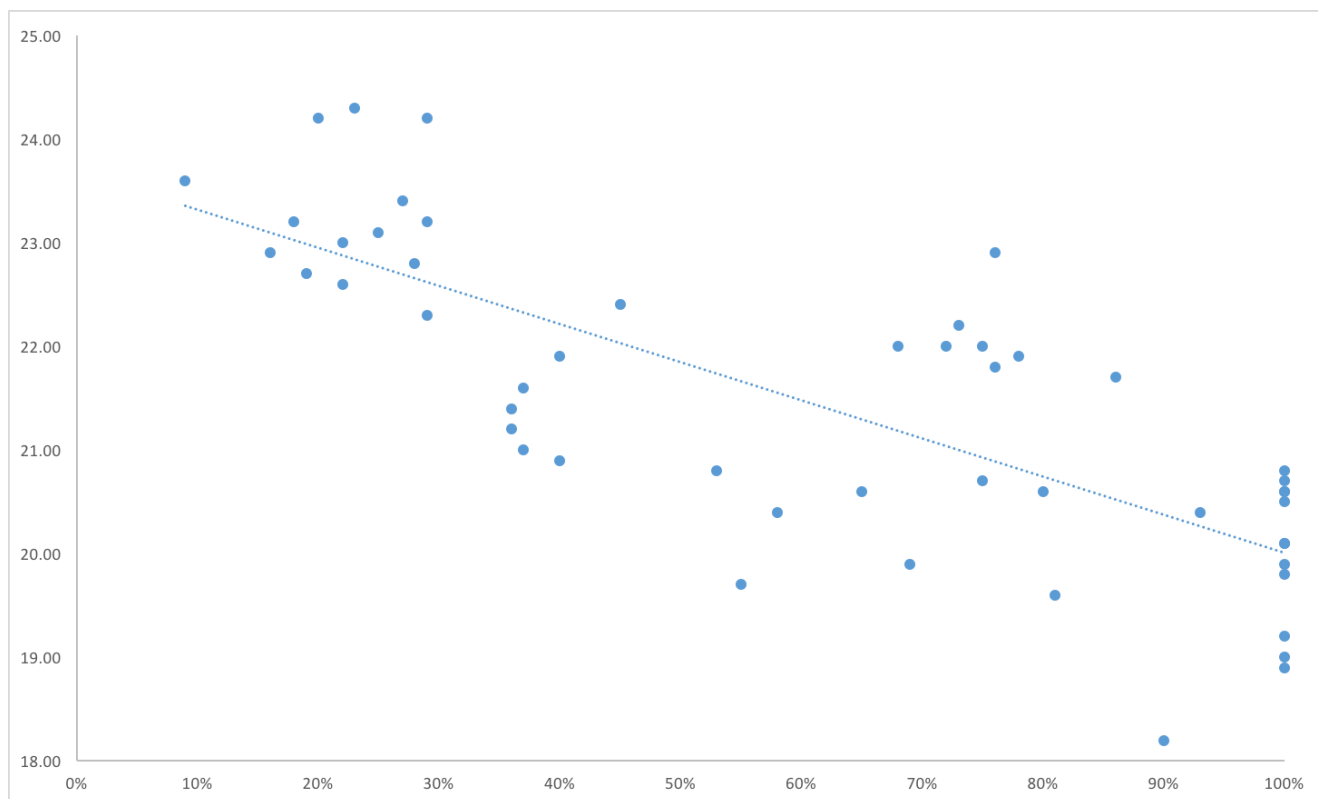
The lowest raw SAT state is Washington DC, which also has the highest participation at 100%. Likewise, this indicates that the district required everyone to take the SAT, so even students who didn't want to take it at all had to take it -- and this last group probably didn't study much and aren't naturally good at the SAT.

We can see this negative relationship between participation rates and SAT / ACT scores in the two graphs below. On each X-axis, you see the participation rate expressed as a decimal (for example, .50 means half the people participated.) On the Y-axis, you see average SAT or ACT score. **The pattern is stunningly clear: States with higher participation rates in either test almost always have much lower scores.**

### Raw SAT Average Score per State vs. Participation Rate



### Raw ACT Average Score per State vs. Participation Rate



**This pattern would cause terrible bias if you were to judge a state by its raw SAT or ACT averages.** You would be giving a highly unfair advantage to states with low participation rates which can showcase their best students. In fact, participation rates explain the vast majority (more than 80%) of natural variation in SAT scores and ACT scores. This means that correcting for participation rates is absolutely necessary.

## How Is the Adjusting Done?

Basically, the adjusting is done when we take one state's raw test scores and compare them to other states **with similar participation rates**. For example, take Massachusetts, with its raw SAT average score of 1556. If you look at this score by itself, it's not impressive -- pretty middle of the pack. But Massachusetts has an SAT participation rate of 84% -- one of the highest in the nation. Therefore, during adjustment, we compare this against a state with a similar participation rate: for example Maryland, with a rate of 78%. We see Maryland has an SAT score of 1468 -- and thus **Massachusetts is actually very impressive when compared to peer states with similar participation rates**.

As a researcher with both a Master's in statistics and a Doctorate in economics, including economic statistical methods, I ensured that the method used above is **robust**. That is, I



made sure I used as much information as possible during norming to infer the SAT / ACT scores that each state would have gotten if they had the same participation rates. The methods I used should be rather immune to slight errors in the assumptions, and few assumptions were made to begin with. I also documented all my methods here so any other statistician can replicate my results to verify they are true [1].

## How Are State Averages Useful for Students?

One of the ways state average scores are most useful for students is as a peer group to compare to. If you want to know what a good, bad, or excellent SAT is or ACT score is, then these state averages provide a reference. However, you should understand that you can be more than average. **You can improve your score and beat your state average, sometimes by a substantial amount, if you prep for the SAT and ACT.** In fact, some of the top states in the list above, Massachusetts and Connecticut, are well-known for some of their top prep shops.

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## What's Next?

**Want to know how well you did on the SAT / ACT** or what score you should be aiming for? Learn [what's a good SAT score](#) and [what's a good ACT score!](#)

Interested in more information to help you understand this data? Check out [average SAT scores by state](#) and [average ACT scores by state](#). These articles can help you understand how well your state is doing and **how your test scores compare to other students within your state.**

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[1] The full method I used was linear regression on states as observations (N=51). The regression was of both SAT scores onto participation rates on both the SAT and ACT, their interactions, and their second powers, as well as a constant. An analogous regression was made for SAT scores. The SAT score residual from this regression was added to the statewide average SAT score to get predicted SAT scores of all states if they had the same participation rate -- namely that of the average state. It turns out that simple one element regression of SAT scores on SAT participation rates captures the vast majority of variation of the full regression, so similar results should hold in this more robust base case. Participation rates explained up to about 80% of the variation in both SAT and ACT scores, and, therefore, this correction is substantial.

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**Dr. Fred Zhang**

### About the Author

Fred is co-founder of PrepScholar. He scored a perfect score on the SAT and is passionate about sharing information with aspiring students. Fred graduated from Harvard University with a Bachelor's in Mathematics and a PhD in Economics.

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**Mary** 3/17/2016, 8:20:19 AM

Any reason half of Michigan is colored yellow instead of pink?

I tease, I know you didn't make the map.

Anyway, thanks for the score report! I live in Japan and I have some students wanting to take the SAT and ACT so they can go to American universities, so I'll be showing them this.

Reply to *Mary*

**Laura Staffaroni** 4/1/2016, 3:28:46 AM

We're glad you found the article useful! And apparently whoever created the map had some hate for the upper peninsula.

Reply to *Laura Staffaroni*

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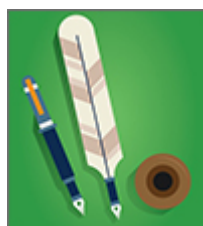
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