$$\delta = (0.50)\sqrt{\frac{25}{2}} = 0.50\ \sqrt{12.5} = 0.50\ (3.54)$$

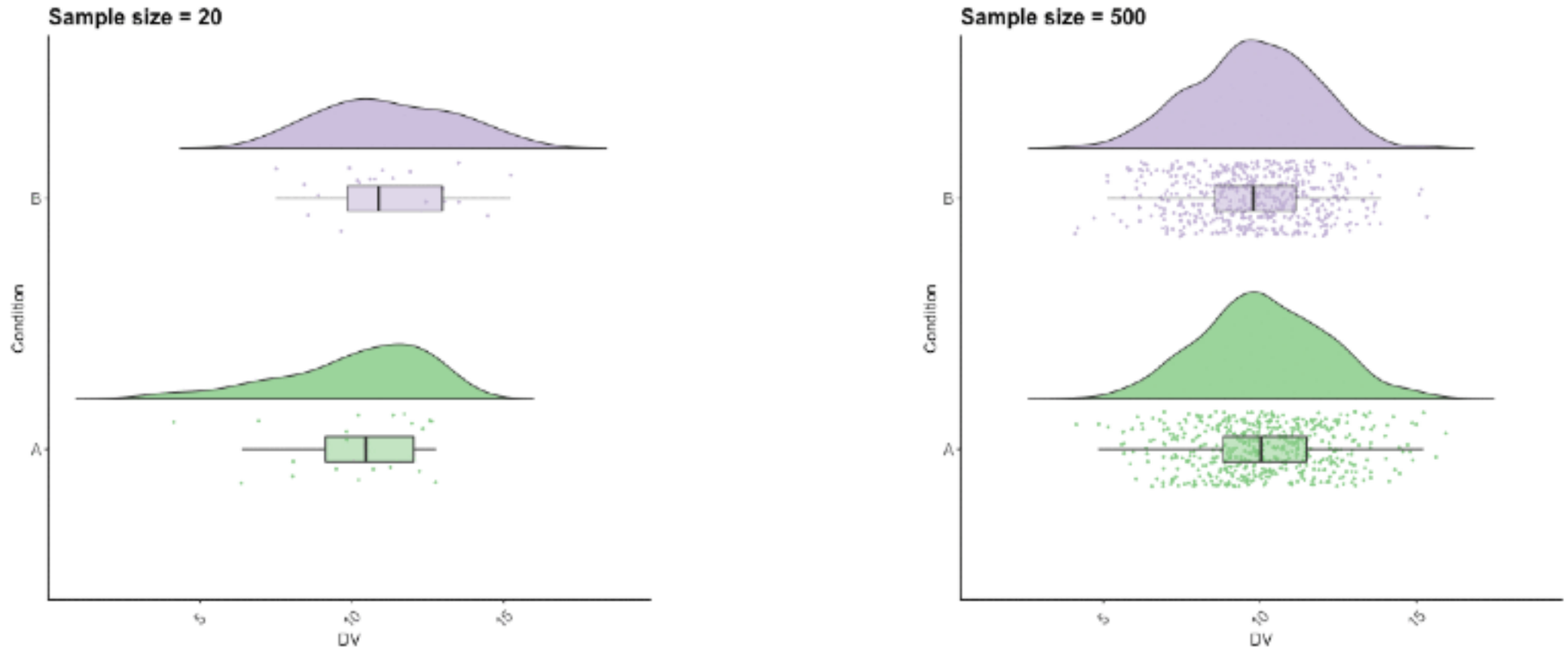
$$= 1.77$$

With $\alpha = 0.05$ and $\delta = 1.77$, Power is about 0.43

This means there is a 57% chance of failing to find a difference (even though one might be present).

δ	$\alpha = 0.05$
1.4	0.29
1.5	0.32
1.6	0.36
1.7	0.4
1.8	0.44
1.9	0.48

The Problem of Sampling Bias



Samples for conditions A and B are drawn from the same population. Due to sampling error, with small samples (e.g., N=20) we might sometimes conclude there is a difference between A and B where there isn't one (as you can see with the N=500 samples).