Consider the following two cases.

Test A. We are trying to estimate the mean μ of a population's height. We know the standard deviation is $\sigma = 10$. We take a sample of size N=100. We believe the sampling distribution of the mean is normal i.e. $\bar{X}_A \sim N(\mu, \frac{10}{\sqrt{100}})$ so $\bar{X}_A \sim N(\mu, 1)$.

We observe $\bar{x}_A = 152$.

We want to calculate the severity with which the claim C: $\mu > 151$ passes this test with the data we have observed. So we need to calculate $\Pr(\bar{X}_A \leq 152;\ \mu \leq 151)$. We only need to evaluate severity at the point $\mu = 151$ (because this probability is greater for all values of μ less than 151). $\Pr(\bar{X}_A \leq 152;\ \mu = 151) = 0.84$ so
SEV(T_A, $\bar{x}_A$=152, C: $\mu > 151$) = 0.84.

Test B. We are trying to estimate the mean μ of the same population. This time we take a sample of size N=10000. We believe the sampling distribution of the mean is normal i.e. $\bar{X}_B \sim N(\mu, \frac{10}{\sqrt{10000}})$ so $\bar{X}_B \sim N(\mu, \frac{1}{10})$.

We observe $\bar{x}_B = 151.1$.

We want to calculate the severity with which the claim C: $\mu > 151$ passes this test with the data we have observed. $\Pr(\bar{X}_B \leq 151.1;\ \mu = 151) = 0.84$ so
SEV(T_B, $\bar{x}_B$=151.1, C: $\mu > 151$)=0.84.

What I am a little troubled by (just a little!) is the following:

The severity with which claim C passes test A with data $\bar{x}_A$ is the same as the severity with which claim C passes test B with data $\bar{x}_B$
i.e. SEV(T_A, $\bar{x}_A$=152, C: $\mu > 151$) = SEV(T_B, $\bar{x}_B$=151.1, C: $\mu > 151$).

However, (I think) the following is true:

$$\Pr(\bar{X}_B \leq 151.1;\ \mu = a) > \Pr(\bar{X}_A \leq 152;\ \mu = a)$$

for all $a < 151$.

So intuitively because of this fact (if it's true) it seems that the severity with which claim C passes Test B with data $\bar{x}_B$ is higher than the severity with which claim C passes Test A with data $\bar{x}_A$. But perhaps my intuitions are wrong and even if they are right I don't think there would be a way to cash out this intuition in a satisfactory way. But I was just wondering what you thought about this! Thank you again!