$$SD = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

Standard deviation is just another way of characterizing **variance**.

We take the square root of the variance because this provides a “unit of measurement” that’s more interpretable.

So, if the variance is 9 *units*^{2}, then standard deviation is 3 *units*, a value we can more readily use and interpret in our analyses.

HOWEVER, the formulae we use for a sample and a population are different!

Most researchers almost never work with population data.

We use samples to infer the population's variance.

	Population	*Estimate Based on a Sample*
Variance	$\sigma^2 = \frac{\Sigma(X-\mu)^2}{N}$	$s^2 = \frac{\Sigma(X-\overline{X})^2}{n-1}$
	where Σ = to sum X = a score in the distribution μ = the population mean N = the number of cases in the population	where Σ = to sum X = a score in the distribution $\overline{X}$ = the sample mean n = the number of cases in the sample
Standard Deviation	$\sigma = \sqrt{\frac{\Sigma(X-\mu)^2}{N}}$	$s = \sqrt{\frac{\Sigma(X-\overline{X})^2}{n-1}}$
	where Σ = to sum X = a score in the distribution μ = the population mean N = the number of cases in the Population	where Σ = to sum X = a score in the distribution $\overline{X}$ = the sample mean n = the number of cases in the sample

We use samples to infer the population's variance.

	Population	sample
Standard Deviation	$\sigma = \sqrt{\frac{\Sigma(X-\mu)^2}{N}}$	$s = \sqrt{\frac{\Sigma(X-\overline{X})^2}{n-1}}$
	where Σ = to sum X = a score in the distribution μ = the population mean N = the number of cases in the Population	where Σ = to sum X = a score in the distribution $\overline{X}$ = the sample mean n = the number of cases in the sample