

# What is the difference between left skewed and right skewed distributions?

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## RECOMMENDED CITATION

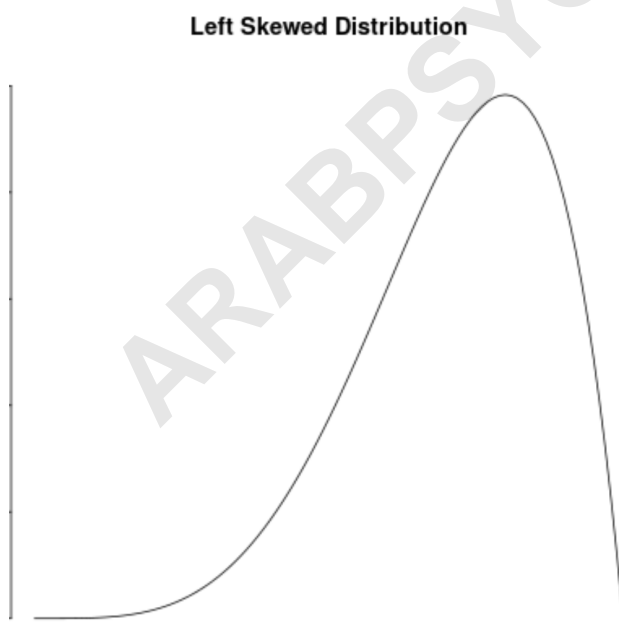
stats writer (2024). *What is the difference between left skewed and right skewed distributions?*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=138824>

A left skewed distribution is one where the tail of the distribution is longer on the left side, indicating that most of the data points are on the right side of the distribution. This means that the majority of the data is clustered towards the lower end of the distribution. On the other hand, a right skewed distribution has a longer tail on the right side, indicating that most of the data points are on the left side of the distribution. This means that the majority of the data is clustered towards the higher end of the distribution. In summary, the main difference between left skewed and right skewed distributions is the direction in which the data is clustered, either towards the lower or higher end of the distribution.

## Left Skewed vs. Right Skewed Distributions

**Skewness is a way to describe the symmetry of a distribution.**

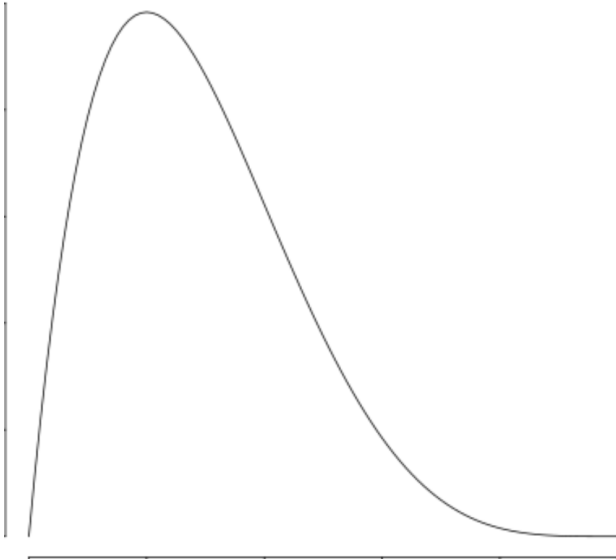
**A distribution is left skewed if it has a "tail" on the left side of the distribution:**



**A distribution is right skewed if it has a "tail" on the**

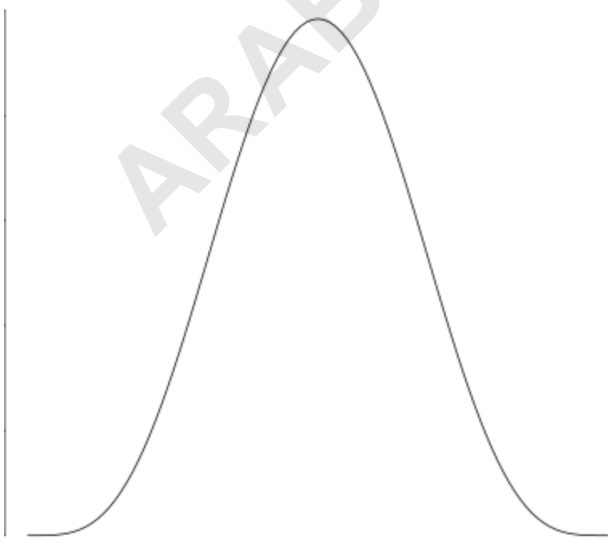
## right side of the distribution:

Right Skewed Distribution



And a distribution has no skew if it's symmetrical on both sides:

No Skew

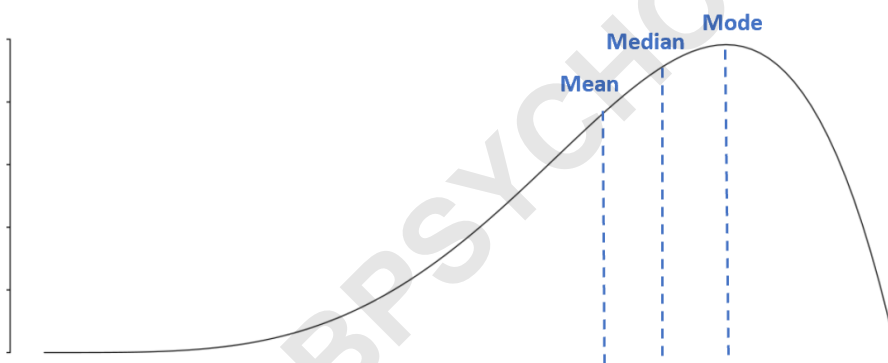


**Note that left skewed distributions are sometimes called "negatively-skewed" distributions and right skewed distributions are sometimes called "positively-skewed" distributions.**

### Properties of Skewed Distributions

The following diagrams show where the mean, median and mode are typically located in different distributions.

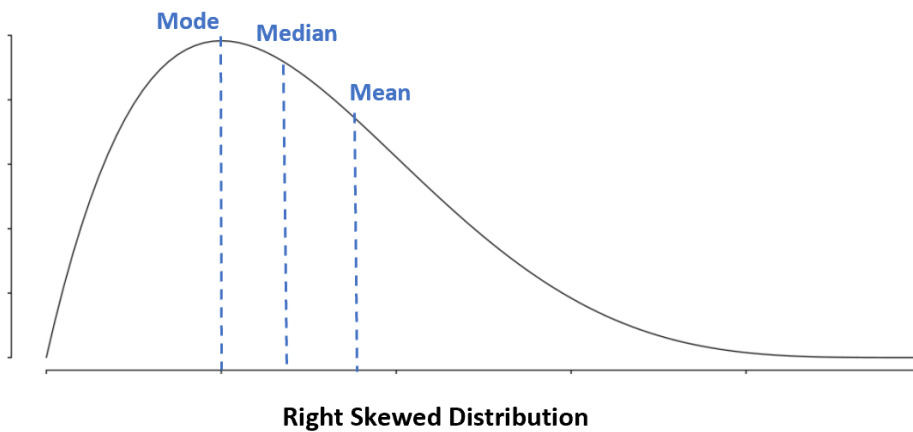
#### Left Skewed Distribution: $\text{Mean} < \text{Median} < \text{Mode}$



Left Skewed Distribution

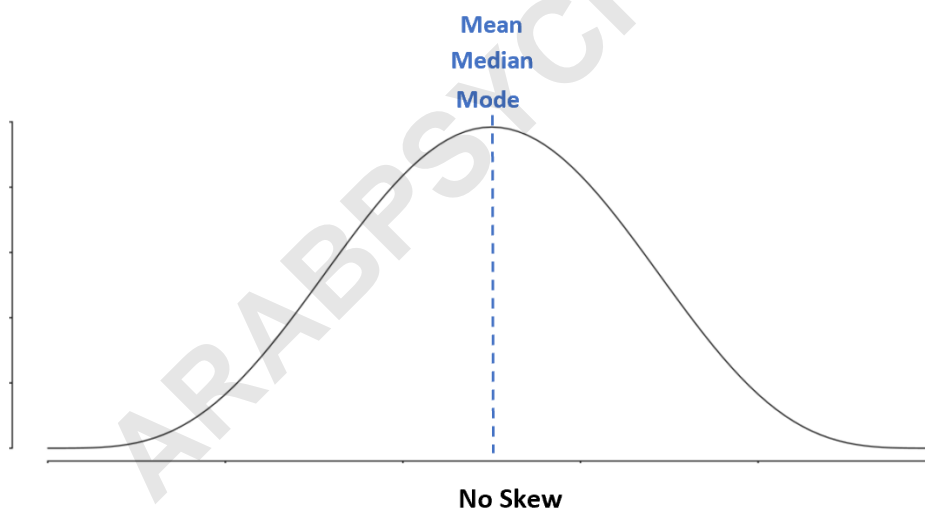
**In a left skewed distribution, the mean is less than the median.**

#### Right Skewed Distribution: $\text{Mode} < \text{Median} < \text{Mean}$



**In a right skewed distribution, the mean is greater than the median.**

**No Skew: Mean = Median = Mode**



**In a , the mean, median, and mode are all equal.**

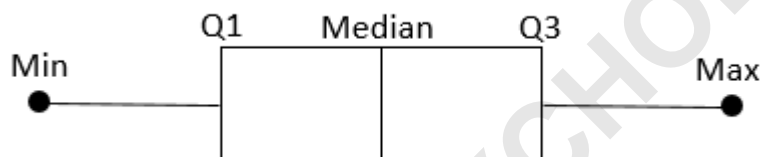
**Using Box Plots to Visualize Skewness**

**A box plot is a type of plot that displays the five number**

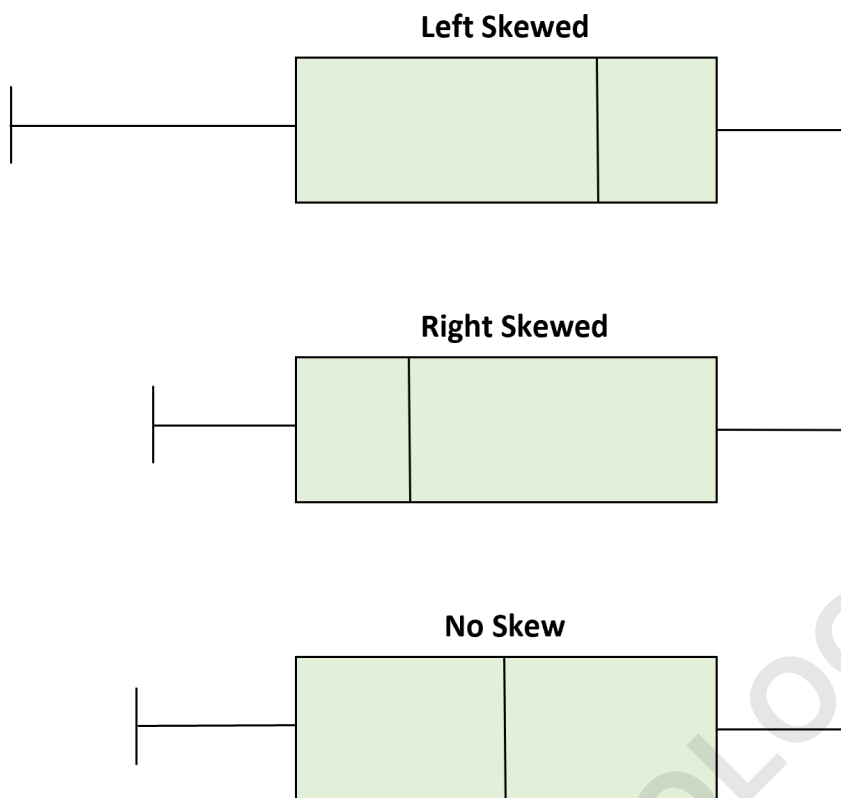
**summary of a dataset, which includes:**

**The minimum value  
The first quartile (the 25th percentile)  
The median value  
The third quartile (the 75th percentile)  
The maximum value**

**To make a box plot, we draw a box from the first to the third quartile. Then we draw a vertical line at the median. Lastly, we draw "whiskers" from the quartiles to the minimum and maximum value.**



**Depending on the location of the median value in the boxplot, we can tell whether or not a distribution is left skewed, right skewed, or symmetrical.**



**When the median is closer to the bottom of the box and the whisker is shorter on the lower end of the box, the distribution is right skewed.**

**When the median is closer to the top of the box and the whisker is shorter on the upper end of the box, the distribution is left skewed.**

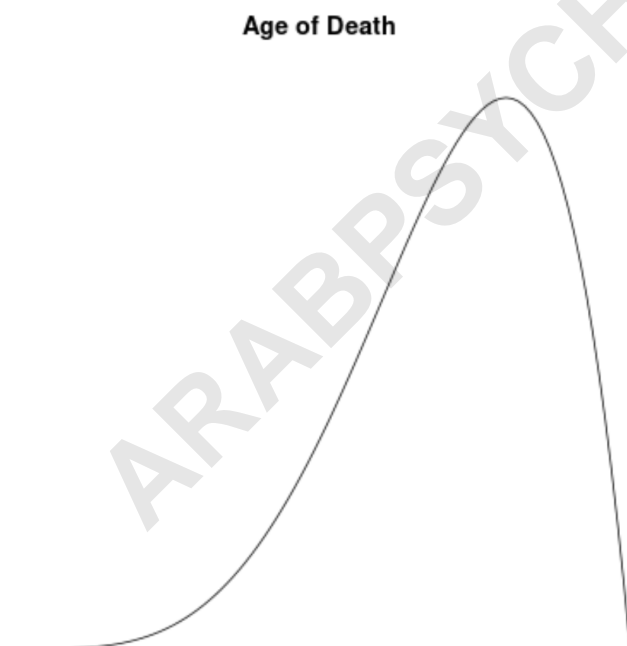
**When the median is in the middle of the box and the whiskers are roughly equal on each side, the distribution is symmetrical.**

## Examples of Skewed Distributions

**Here are some real-life examples of skewed distributions.**

**Left-Skewed Distribution: The distribution of age of deaths.**

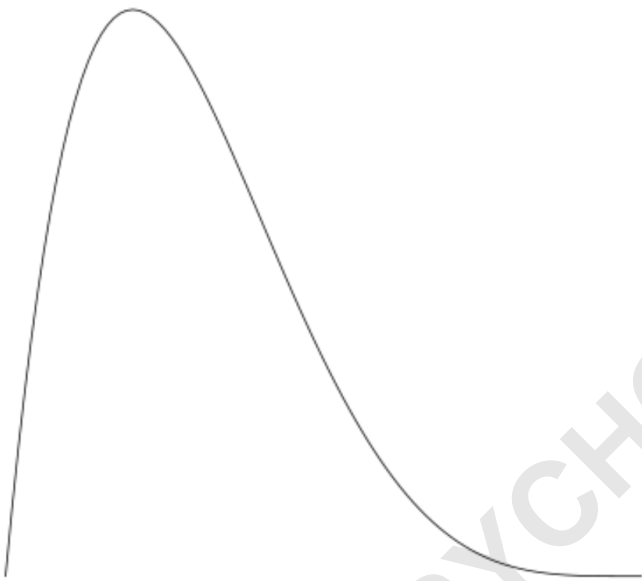
The distribution of the age of deaths in most populations is left-skewed. Most people live to be between 70 and 80 years old, with fewer and fewer living less than this age.



**Right-Skewed Distribution: The distribution of household incomes.**

**The distribution of household incomes in the U.S. is right-skewed, with most households earning between \$40k and \$80k per year but with a long right tail of households that earn much more.**

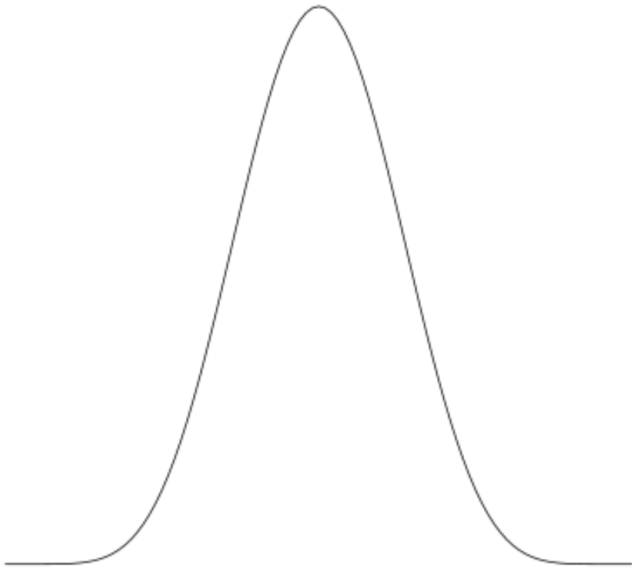
**Distribution of Household Incomes**



**No Skew: The distribution of male heights.**

**It's well-known that the height of males is roughly normally distributed and has no skew. For example, the average height of a male in the U.S. is roughly 69.1 inches. The distribution of heights is roughly symmetrical, with some being shorter and some being taller.**

**Distribution of Male Heights**



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