

Is Age an Interval or Ratio Variable? (Explanation & Example)

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Age is a numerical variable that measures the amount of time that has passed since an individual's birth. It can be classified as either an interval or ratio variable, depending on the scale of measurement used.

In interval measurement, the numerical values have equal distance between each other, but the zero point is arbitrary and does not represent a true absence of the phenomenon being measured. An example of this is the Fahrenheit temperature scale, where the difference between 30 and 40 degrees is the same as the difference between 80 and 90 degrees, but 0 degrees does not indicate a complete absence of temperature.

On the other hand, in ratio measurement, the numerical values have equal distance between each other and the zero point represents a true absence of the phenomenon being measured. An example of this is weight, where 0 kilograms represents a complete absence of weight and the difference between 10 and 20 kilograms is the same as the difference between 50 and 60 kilograms.

In conclusion, age can be considered an interval variable if measured in years or months, where the difference between each unit of measurement is equal, but the zero point (birth) does not indicate a true absence of age. However, if measured in age in months since birth, it can be considered a ratio variable as the zero point represents a true absence of age and the difference between each unit of measurement is equal.

Is Age An Interval or Ratio Variable? (Explanation & Example)

In statistics, all variables are measured on one of four :

Nominal: Variables that have no quantitative values.
Ordinal: Variables that have a natural order, but no quantifiable difference between values.
Interval: Variables that have a natural order and a quantifiable difference between values, but no "true zero" value.
Ratio: Variables that have a natural order, a

quantifiable difference between values, and a "true zero" value.

The following graphic summarizes these different levels of measurement:

Levels of Measurement

Nominal	Ordinal	Interval	Ratio
"Eye color"	"Level of satisfaction"	"Temperature"	"Height"
Named	Named	Named	Named
	Natural order	Natural order	Natural order
		Equal interval between variables	Equal interval between variables
			Has a "true zero" value, thus ratio between values can be calculated

One question students often have is:

Is "age" considered an interval or ratio variable?

The short answer:

Age is considered a ratio variable because it has a "true zero" value.

It's possible for an individual to be zero years old (a newborn) and we can say that the difference between 0 years and 10 years is the same as the difference between 10 years and 20 years.

Since age is a ratio variable, we can also say that someone who is 10 years old is twice as old as someone who is 5 years old.

Contrast this with an interval variable like temperature: We cannot say that 10 degrees Celsius is twice as warm as 5 degrees Celsius because there is no "true zero" when it comes to temperature since degrees can be negative.

When is Age Not a Ratio Variable?

The only time that age would not be considered a ratio variable is if the data we collect on age is in categories.

For example, we may send out a survey and ask people to report which age bracket they belong in from the following choices:

0-19 years old 20-39 years old 40-59 years old 60+ years old

In this scenario, age would be treated as an ordinal variable because a natural order exists among the potential values.

We would say 0-19 years old is younger than 20-39 years old, which is younger than 40-50 years old, which is younger than 60+ years old.

This represents a rare scenario where we would not classify age as a ratio variable.