What is the interpretation of Cohen’s d and can you provide some examples?

Authored by

stats writer

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Cohen's d is a statistical measure used to determine the effect size of a particular experiment or study. It is used to quantify the difference between two groups in terms of standard deviation units. A larger value of Cohen's d indicates a greater difference between the two groups. This measure is commonly used in social sciences, education, and psychology to assess the magnitude of the effect of an intervention or treatment. For example, in a study comparing the academic performance of students who received extra tutoring versus those who did not, Cohen's d can be used to determine the effectiveness of the tutoring program. A high value of Cohen's d would suggest a significant improvement in academic performance for the students who received tutoring. In summary, Cohen's d provides a standardized way to interpret and compare the effect size of different treatments or interventions.

Interpret Cohen's d (With Examples)

In statistics, we often use to determine if there is a statistically significant difference between the mean of two groups.

However, while a p-value can tell us whether or not there is a statistically significant difference between two groups, an effect size can tell us how large this difference actually is.

One of the most common measurements of effect size is Cohen's d, which is calculated as:

Cohen's d = (x1 - x2) / √(s12 + s22) / 2

where:

x1 , x2: mean of sample 1 and sample 2,

respectivelys12, s22: variance of sample 1 and sample 2, respectively

Using this formula, here is how we interpret Cohen's d:

A *d* of 0.5 indicates that the two group means differ by 0.5 standard deviations.A *d* of 1 indicates that the group means differ by 1 standard deviation.A *d* of 2 indicates that the group means differ by 2 standard deviations.

And so on.

Here's another way to interpret cohen's d: An effect size of 0.5 means the value of the average person in group 1 is 0.5 standard deviations above the average person in group 2.

The following table shows the percentage of individuals in group 2 that would be below the average score of a person in group 1, based on cohen's d.

Cohen's d	Percentage of Group *2* who would be below average person in Group *1*
0.0	50%
0.2	58%
0.4	66%
0.6	73%
0.8	79%

1.0	84%
1.2	88%
1.4	92%
1.6	95%
1.8	96%
2.0	98%
2.5	99%
3.0	99.9%

We often use the following rule of thumb when interpreting Cohen's d:

A value of 0.2 represents a small effect size.A value of 0.5 represents a medium effect size.A value of 0.8 represents a large effect size.

The following example shows how to interpret Cohen's d in practice.

Example: Interpreting Cohen's d

Suppose a botanist applies two different fertilizers to plants to determine if there is a significant difference in average plant growth (in inches) after one month.

Fertilizer #1:

x1: 15.2s1: 4.4

Fertilizer #2:

x2: 14s2: 3.6

Here is how we would calculate Cohen's d to quantify the difference between the two group means:

Cohen's d = (x1 - x2) / √(s12 + s22) / 2Cohen's d = (15.2 - 14) / √(4.42 + 3.62) / 2Cohen's d = 0.2985

Cohen's d is 0.2985.

Here's how to interpret this value for Cohen's d: The average height of plants that received fertilizer #1 is 0.2985 standard deviations greater than the average height of plants that received fertilizer #2.

Using the rule of thumb mentioned earlier, we would interpret this to be a small effect size.

In other words, whether or not there is a statistically significant difference in the mean plant growth between the two fertilizers, the actual difference between the group means is trivial.

The following tutorials offer additional information on

effect size and Cohen's d: