

8.3: Cohen's Standards for Small, Medium, and Large Effect Sizes

Cohen's d is a measure of "effect size" based on the differences between two means. Cohen's d , named for United States statistician Jacob Cohen, measures the relative strength of the differences between the means of two populations based on sample data. The calculated value of effect size is then compared to Cohen's standards of small, medium, and large effect sizes.

Size of effect	d
Small	≤ 0.2
Medium	$0.2 - 0.8$
Large	≥ 0.8

Table 8.3.1 Cohen's Standard Effect Sizes

Cohen's d is the measure of the standardized difference between two means, calculated as follows:

$$d = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{2} + \frac{s_2^2}{2}}}$$

It is important to note that Cohen's d does not provide a level of confidence as to the magnitude of the size of the effect comparable to the other tests of hypothesis we have studied. The sizes of the effects are simply indicative.

Example 8.3.1

Calculate Cohen's d for the difference between two groups, where $\bar{x}_1 = 4$, $s_1 = 1.5$, $n_1 = 11$, and $\bar{x}_2 = 3.5$, $s_2 = 1$, $n_2 = 9$. Is the size of the effect small, medium, or large? Explain what the size of the effect means for this problem.

Answer

$$d = 0.89$$

The effect is large because 0.89 is greater than Cohen's value of 0.8 for large effect sizes. The size of the differences of the means for the two companies is large, indicating that there is a meaningful difference between them.

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