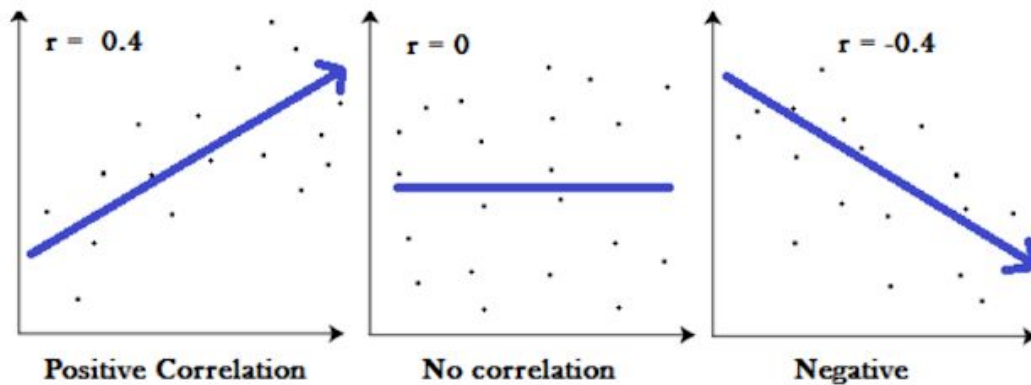Vinoothna Bavireddy

Correlation Coefficient Metrics

In statistics, the correlation coefficient r measures the strength and direction of a linear relationship between two variables on a scatter plot. The value of r is always between +1 and –1(Rumsey,2016).

- 1 indicates a strong positive relationship.
- -1 indicates a strong negative relationship.
- A result of zero indicates no relationship at all.

- Correlation coefficients are used to measure the strength of the relationship between two variables.
- Pearson correlation is the one most commonly used in statistics. This measures the strength and direction of a linear relationship between two variables.
- Correlation coefficient values less than +0.8 or greater than -0.8 are not considered significant.
- Pearson correlation is calculated using the formula:

$$\rho_{xy} = \frac{\text{Cov}(x, y)}{\sigma_x \sigma_y}$$

where:

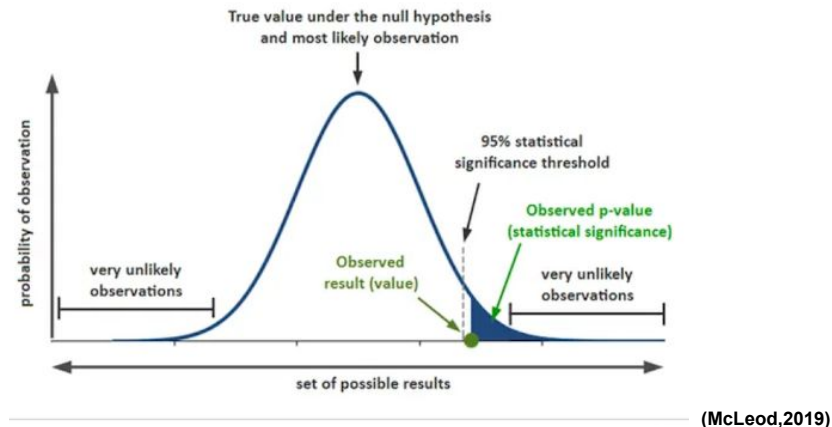$\rho_{xy} = $ Pearson product-moment correlation coefficient

$\text{Cov}(x, y) = $ covariance of variables x and y

$\sigma_x = $ standard deviation of x

$\sigma_y = $ standard deviation of y

Dividing the covariance by the product of two standard deviations will give us the pearson correlation coefficient.

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P-Value:

(McLeod,2019)

In any research there is a possibility that there is no effect between the groups which is stated as a null hypothesis. The null hypothesis states that there is no relationship between the two variables being studied (one variable does not affect the other). It states the results are due to chance.

P values are used to evaluate how well the sample data supports the argument that the null hypothesis is true. P Values are between 0 and 1

Low P values: Indicate strong relationship between the two variables and strong evidence to reject the null hypothesis.

- A p-value less than 0.05 (typically ≤ 0.05) is statistically significant. This means that there is less than a 5% probability the null is correct (and the results are random). Therefore, we reject the null hypothesis, and accept the alternative hypothesis. However, this does not mean that there is a 95% probability that the research hypothesis is true. The p-value is conditional upon the null hypothesis being true is unrelated to the truth or falsity of the research hypothesis(McLeod,2019).

High P values: Indicate weak relationship between the two variables and strong evidence that the null hypothesis is true

- A p-value higher than 0.05 (> 0.05) is not statistically significant and indicates strong evidence for the null hypothesis. This means we retain the null hypothesis and reject the alternative hypothesis(McLeod,2019).

References:

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