PRODUCT-MOMENT CORRELATION

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Product-moment correlation is a statistical measure used to assess the strength and direction of the linear relationship between two variables (Kramer, 2021). It is also known as Pearson's correlation coefficient (PCC) and is typically denoted by the symbol r. The strength of the correlation is determined by how close the data points lie to the line of best fit, which can range from -1 (perfect negative correlation) to +1 (perfect positive correlation). The correlation coefficient can be used to compare the strength of the relationship between two variables across multiple studies.

The product-moment correlation coefficient is calculated using the following formula:

r = ∑ (x - x?) (y - y?) / (√∑ (x - x?)2 * √∑ (y - y?)2)

where x? and y? are the sample means of x and y, respectively. This formula can be used to calculate the correlation coefficient between any two variables, though it is most commonly used to compare the relationship between two continuous variables.

One of the limitations of the product-moment correlation coefficient is that it assumes a linear relationship between the two variables. In cases where the relationship is not linear, the correlation coefficient may not accurately reflect the strength of the relationship. Additionally, the product-moment correlation coefficient only measures the strength of the linear relationship between two variables - it does not indicate the direction of the relationship.

In conclusion, product-moment correlation is a useful measure of the linear relationship between two variables. It is important to note, however, that the correlation coefficient only measures the strength of the relationship and assumes a linear relationship between the variables.

References

Kramer, A. (2021). Product-Moment Correlation. Retrieved from https://statisticsbyjim.com/basics/correlation/