

CORRELATION

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Correlation is a statistic that measures the degree to which two variables move in relation to each other.

Correlation is a statistical technique that can show whether and how strongly pairs of variables are related. For example, height and weight are related; taller people tend to be heavier than shorter people. The relationship isn't perfect. People of the same height vary in weight, and you can easily think of two people you know where the shorter one is heavier than the taller one. Nonetheless, the average weight of people 5'5" is less than the average weight of people 5'6", and their average weight is less than that of people 5'7", etc. Correlation can tell you just how much of the variation in peoples' weights is related to their heights.

Like all statistical techniques, correlation is only appropriate for certain kinds of data. **Correlation works for quantifiable data** in which numbers are meaningful, usually quantities of some sort. It cannot be used for purely categorical data, such as gender, brands purchased, or favorite color.

Definitions of Correlation:

If the change in one variable appears to be accompanied by a change in the other variable, the two variables are said to be correlated and this interdependence is called correlation or covariation.

WHAT THEY SAY ABOUT CORRELATION—SOME DEFINITIONS

1. "When the relationship is of a quantitative nature, the approximate statistical tool for discovering and measuring the relationship and expressing it in a brief formula is known as correlation." —Craxton and Cowden
2. "Correlation is an analysis of the covariation between two or more variables." — A.M. Tuttle
3. "Correlation analysis deals with the association between two or more variables." — Simpson and Kofka

In short, the tendency of simultaneous variation between two variables is called correlation or covariation. For example, there may exist a relationship between heights and weights of a group of students, the scores of students in two different subjects are expected to have an interdependence or relationship between them.

Need for Correlation:

Correlation gives meaning to a construct. Correlational analysis is essential for basic psycho-educational research. Indeed most of the basic and applied psychological research is correlational in nature.

Correlational analysis is required for:

- (i) Finding characteristics of psychological and educational tests (reliability, validity, item analysis, etc.).
- (ii) Testing whether certain data is consistent with hypothesis.
- (iii) Predicting one variable on the basis of the knowledge of the other(s).
- (iv) Building psychological and educational models and theories.
- (v) Grouping variables/measures for parsimonious interpretation of data.
- (vi) Carrying multivariate statistical tests (Hotelling's T^2 ; MANOVA, MANCOVA, Discriminant analysis, Factor Analysis).

(vii) Isolating influence of variables.

Coefficient of Correlation:-

To measure the degree of association or relationship between two variables quantitatively, an index of relationship is used and is termed as co-efficient of correlation.

Co-efficient of correlation is a numerical index that tells us to what extent the two variables are related and to what extent the variations in one variable changes with the variations in the other. The co-efficient of correlation is always symbolized either by r or ρ (Rho).

The notion ' r ' is known as product moment correlation co-efficient or Karl Pearson's Coefficient of Correlation. The symbol ' ρ ' (Rho) is known as Rank Difference Correlation coefficient or spearman's Rank Correlation Coefficient.

The size of ' r ' indicates the amount (or degree or extent) of correlation-ship between two variables. If the correlation is positive the value of ' r ' is + ve and if the correlation is negative the value of V is negative. Thus, the signs of the coefficient indicate the kind of relationship. The value of V varies from +1 to -1.

Correlation can vary in between perfect positive correlation and perfect negative correlation. The top of the scale will indicate perfect positive correlation and it will begin from +1 and then it will pass through zero, indicating entire absence of correlation.

The bottom of the scale will end at -1 and it will indicate perfect negative correlation. Thus numerical measurement of the correlation is provided by the scale which runs from +1 to -1.

[The coefficient of correlation is a number and not a percentage. It is generally rounded up to two decimal places].