

Correlations

Until now the non-parametric tests have predicted differences between experimental conditions. Whether the same or different participants, we have manipulated the IV to test its effect on performance.

Now we are less interested in predicting differences in behaviour as a result of an IV. Instead we want to investigate whether variables are **associated/related** to one another.

So we are predicting that over the whole range of participants, those who score high on the extroversion scale will score low on the altruism scale.

All participants were given the AS and the ES. But this time neither of the variables (A and E scores) will be the IV or DV. But you will take measures of both scores in order to see whether your participants score highly on extroversion and low on altruism, or if they score low on extroversion should score highly on altruism.

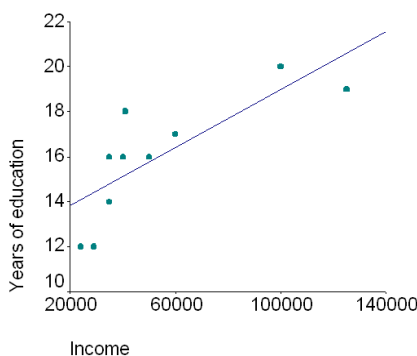
This is a correlational design. The aim is to test the hypothesis that participants score on one variable (extroversion) correlates with their score on another variable (altruism).

Note: we are not predicting that one affects the other...we are simply saying there is a relationship between the two variables.

Positive Correlations

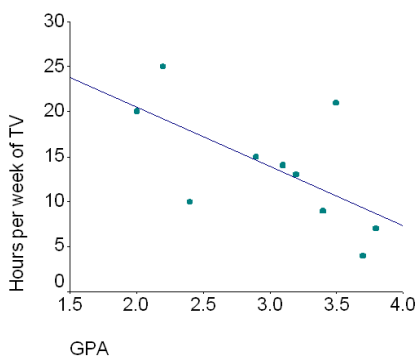
If the scores move in the same direction then this is a positive correlation – high altruism goes together with high extroversion (conversely, low altruism goes together with low extroversion).

These can be high or low depending on how near to 1.00 the scores are.



Negative Correlations

These are when scores on one variable are high (extroversion) and low on another (altruism). Again this can be high or low depending on how near to 1.00 the scores are.



Measurement of exactly how much the two variables are correlated

Correlations are measured in terms of correlation coefficients which indicate the size of the correlation between two variables. They run from zero (no correlation) to 1 (for a perfect positive correlation). So if high on extroversion and low on altruism and the coefficient is -1, this represents a perfect negative correlation coefficient between scores. This is rare- due to human variability. For this reason, most correlations are not perfectly correlated. Most fall between 0 and 1.

Positive – expressed between 0 and 1. The nearer to 0 the lower the correlation, and the nearer to 1 the higher the positive correlation.

Negative – expressed between -1 to 0. The nearer to 0 the higher the correlation, and the nearer to -1 the lower the negative correlation.

So....a coefficient of 0 means that there is no relationship at all between variables. A high negative coefficient (-0.9) represents a large negative correlation, high positive coefficient (0.9) represents a large positive correlation.

The test

A correlational test gives the percentage probability that the scores are due to random variability (null). Based on this, we decide whether probability is sufficiently low to reject the null hypothesis at $p < 0.05$, and instead accept there is a significant correlation in the predicted direction.

You can predict a one-tailed or two tailed.

Examples of outcomes from SPSS

There was a significant positive correlation between extroversion and altruism ($\rho = 0.57$, $N = 30$, $p < .05$, two-tailed).

There was no significant correlation between extroversion and altruism ($\rho = 0.157$, $N = 30$, $p = 0.143$, two-tailed).

Advantage

1. An advantage of the correlation method is that we can make predictions about things when we know about correlations. If two variables are correlated, we can predict one based on the other. For example, we know that SAT scores and college achievement are positively correlated. So when college admission officials want to predict who is likely to succeed at their schools, they will choose students with high SAT scores.

We know that years of education and years of jail time are negatively correlated. Prison officials can predict that people who have spent more years in jail will need remedial education, not college classes.

Disadvantage

1. The problem that most students have with the correlation method is remembering that correlation does not measure cause. Take a minute and chant to yourself: Correlation is not Causation! Correlation is not Causation! I always have my in-class students chant this, yet some still forget this very crucial principle.

We know that education and income are positively correlated. We do not know if one caused the other. It might be that having more education causes a person to earn a higher income. It might be that having a higher income allows a person to go to school more. It might also be some third variable.

A correlation tells us that the two variables are related, but we cannot say anything about whether one caused the other. This method does not allow us to come to any conclusions about cause and effect.