Looking at relationships: Spearman's coefficient of rank correlation
A worked example

In this piece of fieldwork it appeared that there was a positive relationship between soil depth and plant species richness along a transect from the centre of a footpath into longer grass.

Null hypothesis: there is no correlation between soil depth and plant species richness in a $0.25m^2$ quadrat
Alternative hypothesis: there is a significant correlation between soil depth and plant species richness in a $0.25m^2$ quadrat.

r_x check	r_y check	obs. no.	Soil depth mm	ranks of x values (largest no = rank 1)	no. of plant species in $0.25m^2$	ranks of x values (largest no = rank 1)	difference D (r_x - r_y)	Difference Squared (D^2)
y		1	20	10	6	10	0	0
y		2	27	9	8	8	1	1
y		3	30	7	8	8	-1	1
y		4	28	8	8	8	0	0
y		5	35	6	9	6	0	0
y		6	60	4	12	5	-1	1
y		7	54	5	11	4	1	1
y		8	83	3	15	3	0	0
y		9	127	2	19	2	0	0
y		10	150	1	20	1	0	0
						If your rankings are correct this value should be zero →	0	
							sum of D^2 values, $\sum D^2$ →	4

In our example

the number of pairs, n, = 10 so n^3 = 1000 and $n^3 - n$ = 990

and the sum of D^2 values, $\sum D^2$ = 4 so $6\sum D^2$ = 24

Now we can calculate the Spearman coefficient r_s

$$r_s = 1 - \left[\frac{6\sum D^2}{n^3 - n}\right] = 1 - \left(\frac{24}{990}\right) = 1 - 0.024 \text{ so } r_s = 0.976$$

The calculated r_s value of 0.976 is far greater than the critical value of r_s for 10 pairs of observations, which is 0.648

Thus we can reject our null hypothesis and accept our alternative hypothesis, at the 5% probability level. That is, there is a 95% chance that there is a positive relationship between soil depth and plant species richness along our transect