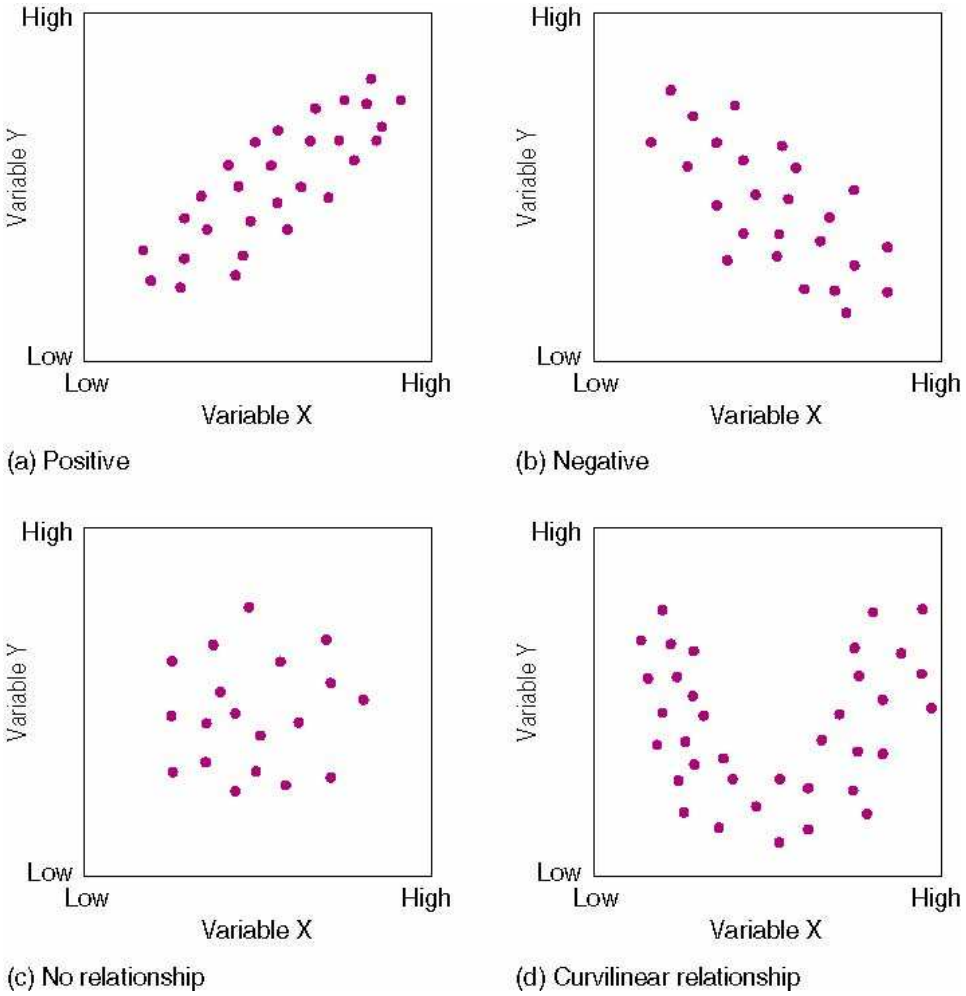
Correlation

- **Correlation is “a statistical technique used to determine the relationship between two or more variables”**
- **Correlation quantifies the degree to which two variables are related.**
- **Correlation does not fit a line through the data points. You simply are computing a correlation coefficient (r) that tells you how much one variable tends to change when the other one does**

What is the difference between correlation and regression?

The correlation answers the STRENGTH of linear association between paired variables, say X and Y. On the other hand, the regression tells us the FORM of linear association that best predicts Y from the values of X.

Graphs of the Relationship Between Variables



Types of Relationships

- **The scattergram can indicate a positive relationship, a negative relationship, or a zero relationship.**
- **What are the characteristics of positive, negative, and zero relationships?**
- **The correlation coefficient, *r*,* represents the relationship between two different variables (usually designated X and Y)**

- **The values of the coefficient will always range from +1.00 to -1.00**
- **A correlation coefficient near 0.00 indicates no relationship**

Statistical Hypothesis

- **Every r value (a sample statistic) strives to represent r (The actual correlation value in the population).**
- **When r gets bigger, we get more confident that there**
- **really is a correlation. We know one of two things must be true.**
- **H0: r = *0 [There is NO actual correlation]***
- **HA: r *0 [This is a correlation]***

SPSS Bivariate Correlation Output

Correlations

		X	Y
X	Pearson Correlation	1	.947
	Sig. (2-tailed)		.053
	N	4	4
Y	Pearson Correlation	.947	1
	Sig. (2-tailed)	.053	
	N	4	4

The Correlation Coefficient and Cause-and-Effect

Example: There is a high correlation between a person's shoe size and their math skills in grades K through 6

Is this an example of cause-and-effect?

Reporting correlation in APA style

Correlations are reported with the degrees of freedom in parentheses and the significance level:

The two variables were strongly correlated, $r(55) = .49$, $p < .01$.

Exercises

Birds