CHAPTER 13

FILL-IN-THE-BLANK ITEMS

Linear Correlation

The degree of relationship between two or more variables is called (1) _____. If the relationship is best described by means of a straight line, we call this (2) _____ _____.

Classes of correlation

A direct relationship between two variables, in which a high score is associated with a (3) _____ score and a low score with a (4) _____ score, is called (5) _____ correlation. One way to study the relationship between the variables is with a (6) _____ or graph on which scores for one variable are plotted on the *X* axis and scores for the other variable are plotted on the *Y* axis. An inverse relationship between the variables is called (7) _____ correlation and is shown by a line sloping (8) _____ to the right on a scatterplot. If the relationship between the variables is very small or nonexistent, the "class" of correlation is called (9) _____ correlation. The strength of a relationship between two variables is given by the (10) _____ _____ of the correlation coefficient.

Correlation and causation

A high correlation between two variables doesn't automatically mean that one variable (11) _____ the other. Correlation is necessary but not (12) _____ to determine causality.

The Pearson Product-Moment Correlation Coefficient

The Pearson *r* is defined as the (13) _____ of the *z*-score products for *X*-*Y* pairs of scores. The range of *r* is from (14) _____ to _____. A (15) _____ value of *r* indicates a direct relationship between the variables, and a negative value indicates an (16) _____ relationship. Values of *r* close to (17) _____ indicate little or no relationship between the variables.

Correlation, variance, and covariance

We can define the (18) _____ as the extent to which two variables vary together. The variance, then, is a special case of the (19) _____ of *X* and *X*—of a variable with itself. Standardizing the covariance gives us a simple formula for the (20) _____ _____.

The effect of range on correlation

Restricting the range of either the *X* or the *Y* variable (21) _____ the correlation.

Testing r for significance

To test *r* for significance, we first assume there is (22) _____ _____ in the population between the variables; that is, we assume that the underlying population correlation coefficient, (23) _____, is (24) _____. Then we look in Table (25) _____ for values of *r* known to occur 5% or 1% of the time in samples of a given size, converted to (26) _____, from a population with a (27) _____ coefficient. If the absolute value of our sample coefficient exceeds the critical table value, then we (28) _____ the null

hypothesis, indicating that there is a significant (29) _____ between the variables in the population sampled.

The linear regression equation

Correlation is defined as the degree of (30) _____ relationship between the variables. Based on this definition, we can use correlation for prediction by first computing the equation for the (31) _____ line that best describes the relationship between the variables. The general equation for the regression equation is (32) _____, where *b* is the (33) _____ of the line and *a* is where the line intercepts the (34) _____ _____. The regression line is the line that makes the squared (35) _____ around it as small as possible. Unless *r* is (36) _____, we must compute separate equations to predict *Y* given *X* and *X* given *Y*. The regression formula can be extended to include more than one predictor; this extension is called (37) _____ _____.

The coefficient of determination

The (38) _____ _____ _____, symbolized by (39) _____, tells the amount of variability in one variable explained by variability in the other variable. This gives us a method to assess how (40) _____ the relationship is between *X* and *Y* and is more important than the (41) _____ level.

The Spearman Rank Order Correlation Coefficient

The Spearman coefficient is useful as an alternative to *r* because it is easier to (42) _____. Also, we can use it when the level of measurement on one or both of our variables is (43) _____ scale rather than interval scale as required by the Pearson *r*. With (44) _____ scale data, the exact length of the intervals between scores cannot be specified.

To compute the Spearman r_S, we first (45) _____ the scores on each of the variables from highest to lowest and then find the difference between the (46) _____. If two or more subjects are tied for a particular rank, each subject is given the (47) _____ of the tied ranks.

Other correlation coefficients

The (48) _____ _____ correlation is used when one variable is dichotomous—has only (49) _____ values—and the other variable is continuous or interval level measurement. When both variables are dichotomous, the (50) _____ _____ is used.

A Broader View of Inferential Techniques—The *General Linear Model*

The (51) _____ _____technique is the most general of all the techniques we've studied. As such, it is called the (52) _____ _____. Basically, what we are saying is that the most general way of looking at data has to do with (53) _____ between measures. Thus, regression and correlation give us direct information about the statistical significance of a relationship and also about the (54) _____ of the relationship. Tests such as the *t* test and ANOVA investigate (55) _____ differences, which is the *other* way to study relationships.

Troubleshooting Your Computations

Any *r* or r_S computed must fall within the range of values from (56) _____ to _____. A common error in computing r_S is forgetting to (57) _____ the scores on the two variables. Remember that the fractional part of the r_S formula is subtracted from (58) _____. In computing the regression equation, be particularly careful in handling the last two terms in the equation, (59) _____. The two numbers are added (60) _____.