CHAPTER 10

FILL-IN-THE-BLANK ITEMS

Introduction

In Chapter 9 we looked at a distribution composed of means of single samples drawn from a population, whereas in this chapter we considered (1) _________________ samples taken simultaneously.

The Sampling Distribution of the Differences Between Sample Means

If the behavior of the members of one sample is not related to the behavior of subjects in the other sample, the samples are (2) _________________. The assumption of independence is often made as long as subjects are selected at (3) _________________ and are (4) _________________ assigned to the different treatment conditions.

To construct the sampling distribution of the differences, we first draw (5) _________________ of random samples from the same population. For each sample of the pair, a (6) _________________ is computed and the (7) _________________ between the means is found. A frequency (8) _________________ based on the differences is then made, and from this a frequency (9) _________________ is plotted. The standard deviation of the sampling distribution of differences is called the (10) _________________ _________________ of the differences.

Three properties of the sampling distribution of the differences are: the mean of the distribution is equal to (11) _________________; the larger the size of the samples taken from the population, the more closely the distribution approximates the (12) _________________ curve; and the larger the size of the samples, the (13) _________________ the standard error of the difference between means.

In the sampling distribution of the differences, a score is symbolized by (14) _________________. The mean is symbolized by (15) _________________, and the standard error is symbolized by (16) _________________. Putting these together, the formula for a *z* score is (17) _________________ =_________________. If we divide by the estimated standard error, we obtain the formula for *t*, which is usually written as (18) _________________ =_________________.

Computing *t*: Independent Samples

To compute *t* for independent samples, we need three things: the mean of each sample, the (19) _________________ of subjects in each sample, and the (20) _________________ of each sample. The null hypothesis is that both samples were drawn from the (21) _________________ _________________ and that the mean of the sampling distribution is (22) _________________. The degrees of freedom for the test are given by (23) _________________.

One-tailed versus two-tailed tests

A (24) _________________ test of significance is one considering both ends of the distribution. To use it, we don't have to make any (25) _________________ about the experiment's outcome. The (26) _________________ test, on the other hand, looks only at the tail of the distribution predicted by the experimenter before the experiment. However, with a one-tailed test, we must make our prediction (27) _________________ doing the study.

The (28) _________________ test is a more powerful test if the prediction comes true. A more powerful test is one with which it will be (29) _________________ to reject the null hypothesis.

Assumptions of the two-sample t test

The *t* test assumes that the dependent variable is (30) _________________ distributed in the population from which the samples are drawn. Another assumption is that the population (31) _________________ are homogeneous. If you have reason to suspect that the assumptions will be violated, you should use (32) _________________ samples with the same number of subjects in each. Both assumptions can apparently be violated with (33) _________________ effect upon the conclusions reached with the *t* test, which means that the *t* test is a (34) _________________ test.

Computing *t*: Dependent Samples

In testing H_0, the most desired outcome is (35) _________________ of the null hypothesis. One way to increase the (36) _________________ of the *t* test is to use dependent samples.

One way to obtain dependent samples is to form (37) _________________ _________________ of unrelated individuals with one member of a pair assigned to one treatment group and the other member assigned to the other group. In the (38) _________________ _________________ design, each subject is given both treatments; that is, each subject is his or her own (39) _________________. Sometimes, this type of design is called the (40) _________________ _________________ design. The dependent-samples design increases the power of the test by (41) _________________ the standard deviation of the sampling distribution of differences between related samples.

The direct difference method

(42) _________________ is a procedure used to control for the effects of the order of presentation of the treatment in experiments. A (43) _________________ method of drug presentation is one in which neither the administrator nor the subject knows which drug is being given. With the direct difference method, all calculations are based on the (44) _________________ between each pair of scores rather than on the scores themselves. The *t* ratio is the mean of the differences divided by the estimated (45) _________________ _________________ of the differences. The mean of the differences is defined as the (46) _________________ sum of the differences divided by *N*, which is the number of (47) _________________ of scores. For the test, *df* = (48) _________________.

Troubleshooting Your Computations

The (49) __________________ used must be appropriate to your data; that is, when the samples are assumed to be independent of each other, the *t* test for (50) __________________ samples should be used. If the samples are related or matched in some way, the *t* test for (51) __________________ samples should be used.

The estimated standard error of the differences should always have a (52) __________________ sign. Also, be sure to retain the appropriate (53) __________________ when computing the final value for *t*. In the *t* test for dependent samples, all computations are made on the (54) __________________ scores rather than on the actual scores themselves. Be careful to add the difference scores (55) __________________ — that is, taking the signs into account.

Remember the decision rule for a nondirectional test: If the absolute value of the computed *t* is equal to or larger than the critical value of *t* from Table B, (56) __________________ H_0.