Sign Test

Imagine a counseling psychologist who sees, over a period of months, a number of clients with personal problems. Suppose the psychologist routinely contacts each client for a six month followup to see how they are doing. The counselor could make an estimate of client "adjustment" before treatment and at the followup time (or better still, have another person independently estimate adjustment at these two time periods). We may assume some underlying continuous "adjustment" variable even though we have no idea about the population distribution of the variable. We are intrested in knowing, of course, whether or not people are better adjusted six months after therapy than before. Note that we are only comparing the "before" and "after" state of the individuals with each other, not with other subjects. If we assign a + to the situation of improved adjustment and a - to the situation of same or poorer adjustment, we have the data required for a Sign Test. If treatment has had no effect, we would expect approximately one half the subjects would receive plus signs and the others negative signs. The sampling distribution of the proportion of plus signs is given by the binomial probability distribution with parameter of .5 and the number of events equal to n, the number of pairs of observations. We will use a file labeled signtest.tab for an example. It contains an "adjustment" score for married couples (M and F):

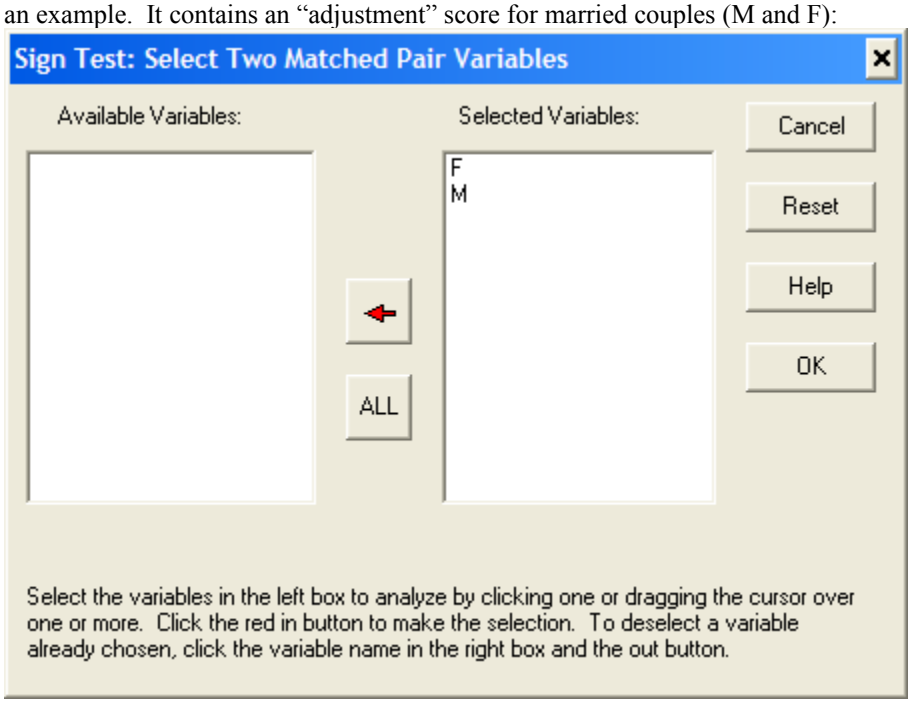

Figure 1. The Sign Test Form

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Results for the Sign Test

Frequency of  11 out of 17 observed + sign differences.
Frequency of   3 out of 17 observed - sign differences.
Frequency of   3 out of 17 observed no differences.
The theoretical proportion expected for +'s or -'s is 0.5
The test is for the probability of the +'s or -'s (which ever is fewer)
as small or smaller than that observed given the expected proportion.

Binary Probability of   0 = 0.0001
Binary Probability of   1 = 0.0009
Binary Probability of   2 = 0.0056
Binary Probability of   3 = 0.0222
Binomial Probability of  3.00 or smaller out of 14.00 = 0.0287
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