

13.1: Advantages and Disadvantages of Nonparametric Methods

The z-test, t-test, and F-test that we have used in the previous chapters are called parametric tests. These tests have many assumptions that have to be met for the hypothesis test results to be valid. This chapter gives alternative methods for a few of these tests when these assumptions are not met.

Advantages for using nonparametric methods:

- They can be used to test population parameters when the variable is not normally distributed.
- They can be used when the data are nominal or ordinal.
- They can be used to test hypotheses that do not involve population parameters.
- In some cases, the computations are easier than those for the parametric counterparts.
- They are easy to understand.

Disadvantages for using nonparametric methods:

- They are *less sensitive* than their parametric counterparts when the assumptions of the parametric methods are met. Therefore, larger differences are needed before the null hypothesis can be rejected.
- They tend to use *less information* than the parametric tests. For example, the sign test requires the researcher to determine only whether the data values are above or below the median, not how much above or below the median each value is.
- They are *less efficient* than their parametric counterparts when the assumptions of the parametric methods are met. That is, larger sample sizes are needed to overcome the loss of information. For example, the nonparametric sign test is about 60% as efficient as its parametric counterpart, the t-test. Thus, a sample size of 100 is needed for use of the sign test, compared with a sample size of 60 for use of the t-test to obtain the same results.

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