

## 8.5: Addressing Violations to Assumptions

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As noted earlier in this chapter, there are several assumptions to the independent samples  $t$  test. When they are met, we can proceed using the standard procedures described throughout this chapter. However, when assumptions of tests are not met it means either the test cannot be used or that a modified or alternative formula must be used. Most of the assumptions have to do with the types of variables and measures used and those cannot be violated. You must always have two independent groups measured on the same, quantitative variable. However, it is possible to proceed with the independent samples  $t$ -test if the assumption of homogeneity of variances has been violated.

Homogeneity of variances should be checked and adjustments must be made when this assumption is violated. Homogeneity of variances can be checked using something known as a Levene's test. This is often done with the aid of SPSS software. If the Levene's test indicates that the variances are significantly uneven, an adjustment to the formula is needed. SPSS provides the results for the independent samples  $t$ -test twice: once in standard form (which is the default to use unless the assumption of homogeneity of variances is violated) and again with an adjustment to address heterogeneous variances, which should be used when the Levene's test shows a significant violation to the assumption. With this in mind, let's turn to how to conduct an independent samples  $t$ -test using SPSS, paying attention to when and how to check, and address violations of, the assumption of homogeneity of variances.

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