9. Self-Esteem The following table lists measures of self-esteem obtained from a student project as supervised by Jannay Morrow at Vassar College (based on data from Richard Lowry). The objective of the project was to study how levels of self-esteem in subjects relate to their perceptions of self-esteem in other target people who were described in writing. Self-esteem levels were measured using the Coopersmith Self-Esteem Inventory, and the test here works well even though the data are at the ordinal level of measurement. Use a 0.05 significance level and apply the methods of two-way analysis of variance. What do you conclude?

		Subject's Self-Esteem		
		Low	Medium	High
Target's Self-Esteem	Low	4 4	3 3	3 1
		3 5	3 4	3 3
		4 4	4 2	3 5
		5 4	4 4	3 2
		2 4	1 2	3 3
		4 2	2 3	3 3
	High	2 2	4 3	3 2
		4 2	1 2	3 2
		2 3	1 3	3 4
		2 4	2 4	3 4
		2 2	3 1	4 3
		2 3	1 4	3 4

10. Pulse Rate The following table lists pulse rates obtained from Data Set 1 in Appendix B. Use a 0.05 significance level and apply the methods of two-way analysis of variance. What do you conclude?

	Under 30 Years of Age	Over 30 Years of Age
Female	78 104 78 64 60 98 82 98 90 96	76 76 72 66 72 78 62 72 74 56
Male	60 80 56 68 68 74 74 68 62 56	46 70 62 66 90 80 60 58 64 60

12-3 Beyond the Basics

11. Transformations of Data Example 1 illustrated the use of two-way ANOVA to analyze the sample data in Table 12-3. How are the results affected in each of the following cases?

a. The same constant is added to each sample value.

b. Each sample value is multiplied by the same nonzero constant.

c. The format of the table is transposed so that the row and column factors are interchanged.

d. The first sample value in the first cell is changed so that it becomes an outlier.