EXERCISES

1. Match the following terms to their definitions.

   a. interaction ___ The average effect of a factor

   b. simple main effect ___ A factor's effect on one group of participants

   c. overall main effect ___ A factor's effect on one group of participants being different from its effect on another group of participants

2. What is the difference between

   a. a simple main effect and an overall main effect?

   b. an overall main effect and an interaction?

3. Can you have an interaction without a main effect? Why or why not?

4. Suppose an experimenter looked at the status of speaker and rate of speech on attitude change and summarized the experiment's results in the following table. Describe the pattern of those results in terms of main effects and interactions. Assume that all differences are statistically significant.

	Status of Speaker	
Rate of Speech	**Low Status**	**High Status**
Slow	10	15
Fast	20	30
	Attitude Change	

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5. Describe the pattern of results in the following table in terms of main effects and interactions. Assume that all differences are statistically significant.

	Status of Speaker	
Rate of Speech	**Low Status**	**High Status**
Slow	10	15
Fast	20	25
	Attitude Change	

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6. Forty participants receive a placebo. The other forty receive a drug that blocks the effect of endorphins (pain-relieving substances, similar to morphine, that are produced by the brain). Half the placebo group and half the drug group get acupuncture. Then, all participants are asked to rate the pain of various shocks on a 1-to-10 (*not at all painful* to *very painful*) scale. The results are as follows: placebo, no acupuncture group, 7.2; placebo, acupuncture group, 3.3; drug, no acupuncture group, 7.2; drug and acupuncture group, 3.3.

   a. Graph the results. (If you need help graphing the results, see Box 12.1 or use the tools on this chapter's website.)

   b. Describe the results in terms of main effects and interactions (making a table of the data may help).

   c. What conclusions would you draw?

7. The following table is an incomplete ANOVA summary table of a study looking at the effects of similarity and attractiveness on liking. Complete the table. (Hint: If you are having trouble, consult Box 12.2 or the sample ANOVA summary table in Summary point 15.) Then, answer these three questions.

   a. How many participants were used in the study?

   b. How many levels of similarity were used?

   c. How many levels of attractiveness were used?

SV	SS	df	MS	F
Similarity (S)	10	1	—	—
Attractiveness (A)	—	2	20	—
S × A interaction	400	—	200	—
Error	540	54	—	
Total	990	59		

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8. A professor does a simple experiment. In that experiment, the professor finds that students who are given lecture notes do better than students who are not given lecture notes. Imagine that you are asked to replicate the

professor's simple experiment as a 2 × 2 factorial.

a. What variable would you add to change the simple experiment into a 2 × 2?

b. Graph your predictions.

c. Describe your predictions in terms of main effects and interactions.

9. A lab experiment on motivation yielded the following results:

Group	Productivity
No financial bonus, no encouragement	25%
No financial bonus, encouragement	90%
Financial bonus, no encouragement	90%
Financial bonus, encouragement	90%

a. Make a 2 × 2 table of these data.

b. Graph these data (for help with graphing, see Box 12.1, p. 489).

c. Describe the results in terms of main effects and interactions. Assume that all differences are statistically significant.

d. Interpret the results.

10. A memory researcher looks at the effects of processing time and rehearsal strategy on memory.

Group	Percent Correct
Short exposure, simple strategy	20%
Short exposure, complex strategy	15%
Long exposure, simple strategy	25%
Long exposure, complex strategy	80%

a. Graph these data. (For help, see Box 12-1 or this book's website.)

b. Describe the results in terms of main effects and interactions. Assume that all differences are statistically significant.

c. Interpret the results.

11. Suppose a researcher wanted to know whether lecturing was more effective than group discussion for teaching basic facts. The researcher did a study and obtained the following results:

Source of Variance	SS	DF	MS	F
Teaching (T)	10	1	10	5
Introversion/ Extroversion (I)	20	1	20	10
$T \times I$	50	1	50	25
Error	100	50	2	

a. What does the interaction seem to indicate?

b. Even if there had been no interaction between teaching and extroversion, would there be any value in including the introversion–extroversion variable? Explain.

c. What, if anything, can you conclude about the *effects* of introversion on learning?

WEB RESOURCES

1. Go to the Chapter 12 section of the book's student website and

a. Look over the concept map of the key terms.

b. Test yourself on the key terms.

c. Take the Chapter 12 Practice Quiz.

2. Use the Chapter 12 website to practice

a. interpreting ANOVA tables and

b. interpreting graphs of results of factorial experiments.

3. Do an ANOVA using a statistical calculator by going to the "Statistical Calculator" link.