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CHAPTER 1: ANALYZING ONE CATEGORICAL VARIABLE

In this chapter, you will begin to analyze results from statistical studies and focus on the process of statistical inference. In particular, you will learn how to assess evidence against a particular claim about a random process.

CHAPTER 2: ANALYZING QUANTITATIVE DATA

This chapter parallels the previous one in many ways. The difference here is that these investigations will involve a *quantitative* variable rather than a *categorical* one. This requires us to learn different tools for graphing and summarizing our data, as well as for statistical inference. In the end, you will find that the basic concepts and principles that you learned in Chapters 1 still apply.

CHAPTER 3: COMPARING TWO PROPORTIONS

In this chapter, you will focus on comparing results from two groups on a categorical variable. These groups could be samples from different populations or they could have been deliberately formed during the design of the study (a *third* source of possible randomness). You will again consider multiple ways to analyze the statistical significance of the difference in the groups, namely simulation, exact methods, and normal approximations to answer whether the observed difference in the groups could have happened "by chance alone." You will also continue to consider issues of statistical confidence and types of errors. A key consideration to keep in mind will be the scope of conclusions that you can draw from the study based on how the data were collected.

CHAPTER 4: COMPARISONS WITH QUANTITATIVE VARIABLES

This chapter parallels the previous one in many ways. We will continue to consider studies where the goal is to compare a response variable between two groups. The difference here is that these studies will involve a *quantitative* response variable rather than a *categorical* one. The methods that we employ to analyze these data will therefore be different, but you will find that the basic concepts and principles that you learned in Chapters 1–3 still apply. These include the principle of starting with numerical and graphical summaries to explore the data, the concept of statistical significance in determining whether the difference in the distribution of the response variable between the two groups is larger than we would reasonably expect from randomness alone, and the importance of considering how the data were collected in determining the scope of conclusions that can be drawn from the study.

CHAPTER 5: COMPARING SEVERAL POPULATIONS, EXPLORING RELATIONSHIPS

The idea of comparing two groups has been a recurring theme throughout this course. In the previous chapters, you have been limited to exploring two groups at a time. You saw that often the same analysis techniques apply whether the data have been collected as independent random samples or from a randomized experiment, although this data collection distinction strongly influences the scope of conclusions that you can draw from the study. You will see a similar pattern in this chapter as you extend your analyses to exploring two or more groups. In particular, you will study a procedure for comparing a categorical response variable across several groups and a procedure for comparing a quantitative response variable across several groups. You will also study the important notion of association between variables, first with categorical variables and then for studies in which both variables are quantitative. In this latter case, you will also learn a new set of numerical and graphical summaries for describing these relationships.