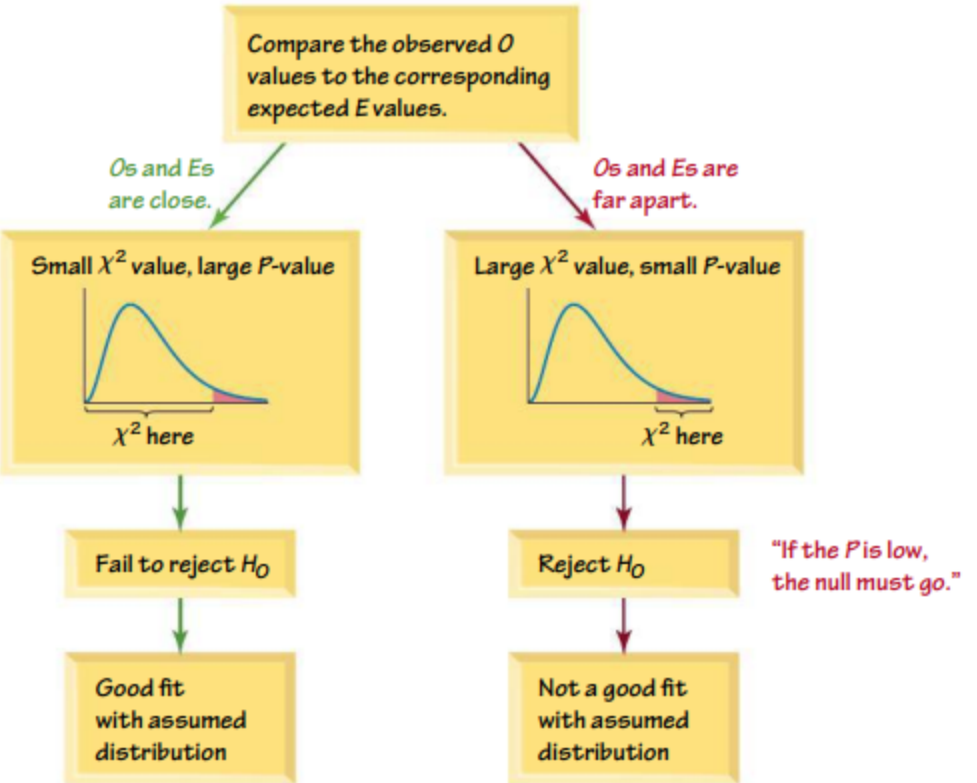

Figure 11-1 **Relationships Among the χ^2 Test Statistic, *P*-Value, and Goodness-of-Fit**

right-tailed, because the critical value and critical region are located at the extreme right of the distribution. If confused, just remember this:

"If the *P* is low, the null must go."

(If the *P*-value is small, reject the null hypothesis that the distribution is as claimed.)

Table 11-2
Last Digits of Weights

Last Digit	Frequency
0	46
1	1
2	2
3	3
4	3
5	30
6	4
7	0
8	8
9	3

Example 1 Last Digits of Weights

A random sample of 100 weights of Californians is obtained, and the last digits of those weights are summarized in Table 11-2 (based on data from the California Department of Public Health). When obtaining weights of subjects, it is extremely important to actually measure their weights instead of asking them to report their weights. By analyzing the *last digits* of weights, researchers can verify that they were obtained through actual measurements instead of being reported. When people report weights, they tend to round, so a weight of 197 lb might be rounded and reported as a more desirable 170 lb. Reported weights tend to have many last digits consisting of 0 or 5. In contrast, if people are actually weighed, the weights tend to have last digits that are uniformly distributed, with 0, 1, 2, . . . , 9 all occurring with roughly the same frequencies.

Test the claim that the sample is from a population of weights in which the last digits do *not* occur with the same frequency. Based on the results, what can we conclude about the procedure used to obtain the weights?

Solution

Requirement check (1) The data come from randomly selected subjects. (2) The data do consist of frequency counts, as shown in Table 11-2. (3) With 100 sample values and 10 categories that are claimed to be equally