The null hypothesis and alternative hypothesis are as follows:

H_0: Whether gum was purchased or the money was kept is independent of whether the subject was given four quarters or a one-dollar bill.

H_1: Whether gum was purchased or the money was kept and whether the subject was given four quarters or a one-dollar bill are dependent.

The given TI-83/84 Plus display shows the test statistic of $\chi^2 = 12.162$ and the P-value of 0.000488 (the rounded P-value expressed in standard form). Because the P-value is less than the significance level of 0.05, reject the null hypothesis of independence. There is sufficient evidence to warrant rejection of independence between the row and column variables.

Interpretation

We reject independence between the row and column variables. It appears that whether the subject purchases gum or keeps the money is dependent on whether the subject is given four quarters or a one-dollar bill. The evidence therefore supports the concept of a "denomination effect."

As in Section 11-2, if observed and expected frequencies are close, the χ^2 test statistic will be small and the P-value will be large. If observed and expected frequencies are not close, the χ^2 test statistic will be large and the P-value will be small. These relationships are summarized and illustrated in Figure 11-5.

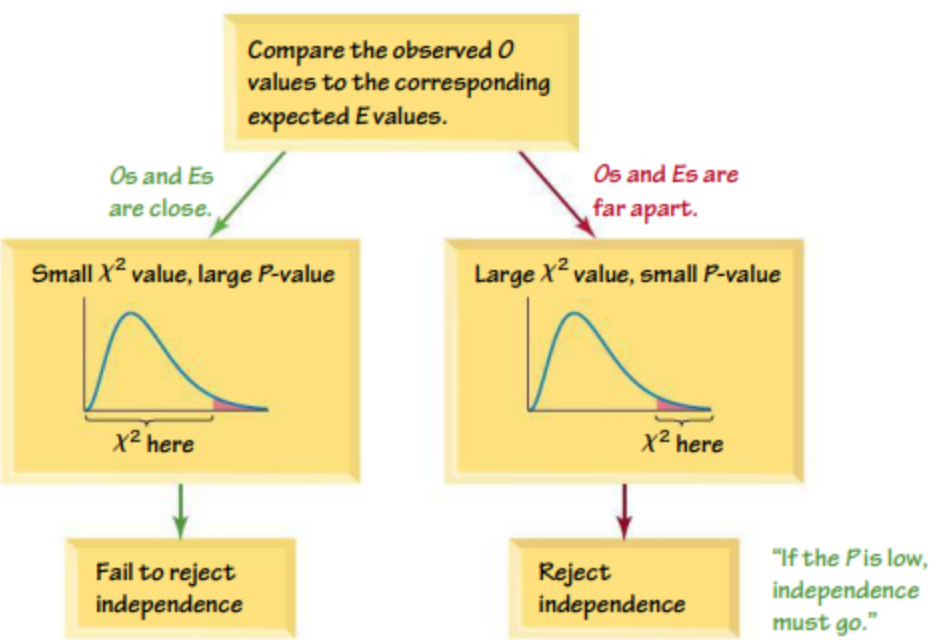

Figure 11-5 Relationships Among Key Components in Test of Independence