Figure 8-5   **Critical Region, Critical Value, and Test Statistic**

Step 7: Make a Decision: Reject H_0 or Fail to Reject H_0

Objective

Form an initial conclusion that will always be one of the following:

1. Reject the null hypothesis H_0.

2. Fail to reject the null hypothesis H_0.

Decision Criteria for Rejecting H_0

P-value Method:

- If P-value $\leq \alpha$, reject H_0.

- If P-value $> \alpha$, fail to reject H_0.

Example: With significance level $\alpha = 0.05$ and P-value $= 0.0548$, we have P-value $> \alpha$, so fail to reject H_0.

Critical Value Method:

- If the test statistic is in the critical region, reject H_0.

- If the test statistic in not in the critical region, fail to reject H_0.

Example: With test statistic $z = 1.60$ and the critical region from $z = 1.645$ to infinity, the test statistic does not fall within the critical region, so fail to reject H_0.

Step 8: Restate the Decision Using Simple and Nontechnical Terms

Objective

Without using technical terms not understood by most people, state a final conclusion that addresses the original claim with wording that can be understood by those without knowledge of statistical procedures.

Example: There is not sufficient evidence to support the claim that the XSORT method is effective in increasing the probability that a baby will be born a girl.

Wording the Final Conclusion For help in wording the final conclusion, refer to Table 8-3, which lists the four possible circumstances and their corresponding conclusions. Note that only the first case leads to wording indicating *support* for the original conclusion. If you want to support some claim, state it in such a way that it becomes the alternative hypothesis, and then hope that the null hypothesis gets rejected.