

and powers of the tests. They conclude that more effort should be spent learning the method given in Part 1, and less emphasis should be placed on the method based on the assumption of  $\sigma_1 = \sigma_2$ . Unless instructed otherwise, we use the following strategy, which is consistent with the recommendations in the article by Moser and Stevens:

**Assume that  $\sigma_1$  and  $\sigma_2$  are unknown, do *not* assume that  $\sigma_1 = \sigma_2$ , and use the test statistic and confidence interval given in Part 1 of this section.**

Figure 9-3 summarizes the methods for inferences about two independent population means.

### Why Not Eliminate the Method of Pooling Sample Variances?

If we use randomness to assign subjects to treatment and placebo groups, we know that the samples are drawn from the same population. So if we conduct a hypothesis test assuming that two population means are equal, it is not unreasonable to also assume that the samples are from populations with the same standard deviations (but we should still check that assumption). The advantage of this alternative method of

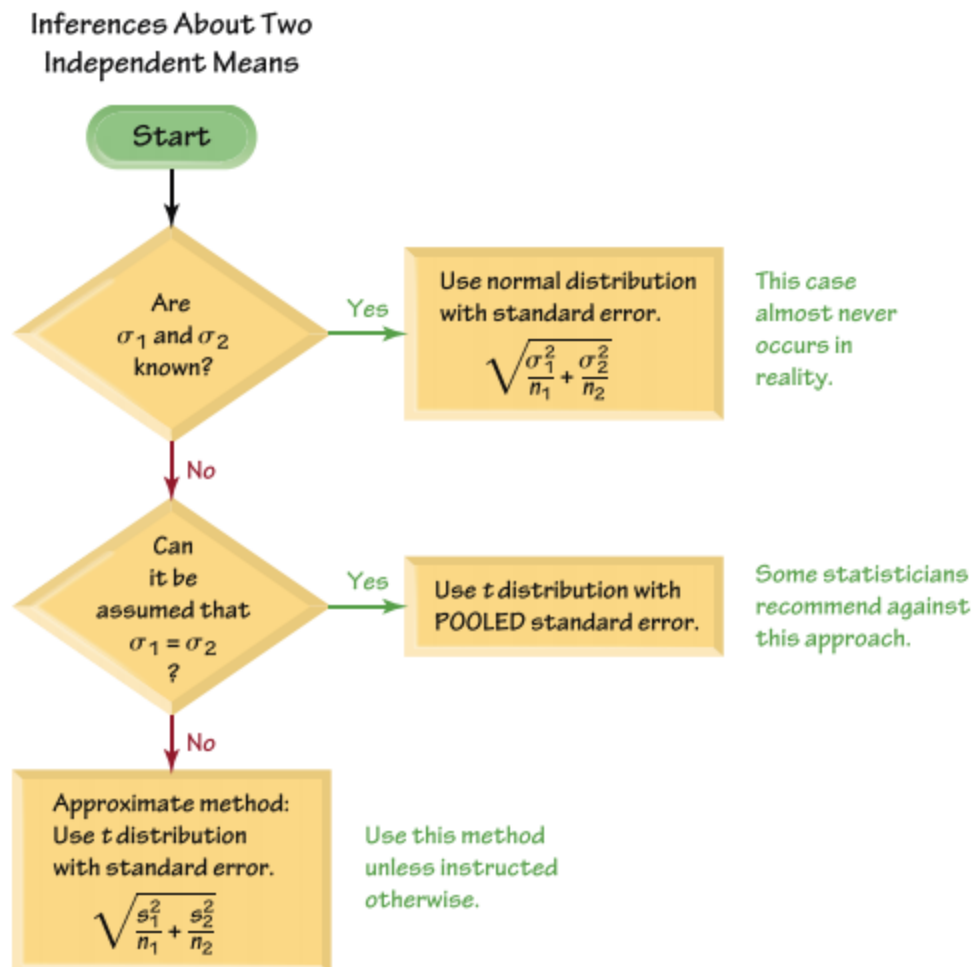
### Super Bowls

Students were invited to a Super Bowl game and half of them were given large 4-liter snack bowls while the other half were given smaller 2-liter bowls. Those using the large bowls consumed 56% more than those



using the smaller bowls. (See "Super Bowls: Serving Bowl Size and Food Consumption," by Wansink and Cheney, *Journal of the American Medical Association*, Vol. 293, No. 14.)

A separate study showed that there is "a significant increase in fatal motor vehicle crashes during the hours following the Super Bowl telecast in the United States." Researchers analyzed 20,377 deaths on 27 Super Bowl Sundays and 54 other Sundays used as controls. They found a 41% increase in fatalities after Super Bowl games. (See "Do Fatal Crashes Increase Following a Super Bowl Telecast?" by Redelmeier and Stewart, *Chance*, Vol. 18, No. 1.)



**Figure 9-3** Methods for Inferences About Two Independent Means