

FIGURE 8.10**Small Effect Size and Low Power for Class 1**

Sampling distribution
assuming the null is true

$$\mu = 38$$

$$SEM = 1.82$$

$$n = 30$$

Sample means in this region have
less than a 5% chance of
occurrence, if the null is true.
Probability of a Type I error = .05

32.54 34.36 36.18 38 39.82 41.64 43.46

Sampling distribution
assuming the null is false—
with a 2-point effect

$$\mu = 40$$

$$SEM = 1.82$$

$$n = 30$$

About 29% of sample means
selected from this population will
result in a decision to reject the
null, if the null is false.
Power = .2946

34.54 36.36 38.18 40 41.82 43.64 45.46
40.99

In this example, when alpha is .05, the critical value or cutoff for alpha is 40.99. When $\alpha = .05$, notice that only about 29% of samples will detect this effect (the power). So even if the researcher is correct, and the null is false (with a 2-point effect), only about 29% of the samples he or she selects at random will result in a decision to reject the null hypothesis.