LEARNING CHECK

1. What is the difference between a within-subjects design and a between-subjects design?

   A: In a between-subjects design, each participant is randomly assigned to one and only one group that is being compared. In a within-subjects design, each participant appears in multiple groups that are being compared.

2. Explain why Stirling et al.'s (2014) experiment requires the use of a paired samples *t* test.

   A: Each participant provided two datapoints. That is, each participant had a number of false alarms and a number of misses that the researchers would compare by using a paired samples *t* test.

3. How is the standard error of the difference scores (used in a paired samples *t* test) similar to the standard error of the difference between the means (used in an independent samples *t* test)?

   A: The standard error of the difference scores is similar to the standard error of the difference between the means because they are both the denominator of their respective *t* tests.

4. Ford Motors (Dearborn, MI) has hired you as a world-renowned organizational psychologist and soon-to-be expert on paired samples *t* tests to conduct research to see whether its employees are more productive before lunch or after lunch. You start by sampling the quantity of work of six people using a 1 (*minimal productivity*) to 7 (*a great deal of productivity*) range. Here are the results of your initial research:

Before Lunch	After Lunch	Difference Score (D)
5	4	1
6	7	−1
6	4	2
5	2	3
4	1	3
5	6	−1

   In addition, you find that the standard error of the difference scores is 0.75 (for now, just trust me that it is 0.75). Plug in the numbers to the conceptual formula for the paired samples *t* test (you'll need to figure out the average difference score yourself).

   A:

$$t = \frac{1.167}{0.75}$$

$$t = 1.56$$