Did I Get This? Scenarios in Case C-Q

Each of the following three questions is an example of a situation in Case C→Q (categorical explanatory and a quantitative response), and therefore calls for comparing means of several (sub) populations. Your task is to decide which of the scenarios of Case C→Q each of the examples represents.

Comment: You'll note that each of these examples is a variation on the same story, yet differs in the scenario it represents. This was done on purpose to highlight the differences between these scenarios.

Question 1:

A publishing company wanted to examine whether typing speeds differ when using word processor A, word processor B, and word processor C.

The company tested the three word processors on three groups of 25 randomly selected typists (each group used one of the three word processors) and recorded the typing speed (in words per minute) for each typist.

Which "case" does this study fall into?

Comparing two means—independent samples

Incorrect. While it is true that the samples in this example are independent (since each was chosen randomly), note that more than two word processors are compared here.

Comparing two means—matched pairs

Incorrect. Note that more than two word processors are compared here. In addition, note that the three samples were chosen randomly and are therefore independent.

Comparing more than two means—independent samples

Correct. In this situation, we are comparing the mean typing speed of three (more than two) word processors, and since each of the three samples was chosen randomly, they are independent.

Question 2:

A publishing company wanted to test whether typing speeds differ when using word processor A or word processor B.

A random sample of 25 typists was selected and the typing speed (in words per minute) was recorded for each typist when using word processor A and when using word processor B. (Which word processor is used first is determined for each typist by a coin flip).

Which "case" does this study fall into?

Comparing two means—independent samples

Incorrect. While it is true that this example calls for comparing two means (the mean typing speed of the two word processors), note that each typist was measured twice.

Comparing two means—matched pairs

Good job! Indeed, this example calls for comparing two means (the mean typing speeds of the two word processors), and since each typist is measured twice, this is an example of matched pairs.

Comparing more than two means—independent samples

Incorrect. Note that we are comparing only two word processors here, and in addition, each typist was measured twice.

Question 3:

A publishing company wanted to test whether typing speeds differ when using word processor A or word processor B.

The typing speeds (in words per minute) are recorded for a random sample of 25 typists using processor A, and for another (different) random sample of 25 typists using word processor B.

Which "case" does this study fall into?

Comparing two means—independent samples

Correct. Indeed, this example calls for comparing two means (the mean typing speeds using the two word processors), and since each of the two samples was chosen randomly, they are independent.

Comparing two means—matched pairs

Incorrect. While it is true that this example calls for comparing two means (the mean typing speeds using the two word processors), note that each of the samples was chosen randomly.

Comparing more than two means—independent samples

Incorrect. While it is true that the samples here are independent (since each was chosen randomly), note that in this example, we are comparing only two word processors.