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Power Calculations in Experimental Design - Quiz

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Question 1

1/1 point (graded)

Suppose that you are designing an experiment. At the outset, which of the following are things that you should consider when deciding on a sample size? (Select all that apply.)

- [ ] a. Decreasing the sample size reduces variation of the sample population, and may allow you to get a more accurate treatment effect
- [x] b. Increasing the sample size allows you to estimate the treatment effect with greater precision
- [x] c. Increasing the sample size will increase the cost of the experiment

✔

Explanation

B and C are correct. One of the key tradeoffs in experimental design is that a greater sample size will result in lower variance and hence allow you to estimate the treatment effect with greater precision. On the other hand, increasing the sample size will usually increase the cost of running the experiment, and you may have to limit the size of your sample to stay within your budget.

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✔ Correct (1/1 point)

Question 2

1/1 point (graded)

In hypothesis testing, type I error refers to the possibility of _____ and type II error refers to the possibility of _____.

a. Not finding a treatment effect when one exists (failing to reject the null when it is in fact false); finding a treatment effect that actually does not exist (rejecting the null when it is in fact true)

b. Finding a treatment effect that does not actually exist (rejecting the null when it is in fact true); not finding a treatment effect when in fact there is one (failing to reject the null when it is in fact false) ✔

Explanation

Type I error refers to the possibility of detecting a treatment effect when there is none, while type II error refers to the possibility of not detecting a treatment effect that does exist. You may sometimes hear Type I error referred to as a false positive, and Type II error referred to as a false negative.

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