Improving Experimental Rigor and Enhancing Data Reproducibility in Neuroscience

Post-Webinar Discussion Questions

1. Scientific training typically adopts an apprenticeship model where trainees are mentored by more senior members of a lab. With this model of training, it can be difficult for younger lab members to speak up if they feel that research practices are not appropriately rigorous. Can you think of some ways to address this issue so that inappropriate research practices are not perpetuated in future generations of scientists?

2. Can you think of any impediments that currently interfere with implementing rigorous experimental practices? (Think: competitive funding climate, competitive publication system, biases for positive outcomes, “the file drawer problem”…)

3. In your research training experience, have you ever experienced any of the common examples of P-hacking covered in this webinar? If so, which one(s)? Would you approach the situation differently after watching this webinar?

4. Please perform a power analysis using this online calculator using the provided means (mu1 and mu 2) and standard deviation (sigma) for two independent samples. How do the sample sizes depend on the spread between means of each sample? Or on the variability between samples? Or on the statistical power and alpha values?

- Exercise 1: default alpha and power
  - Mu1 = 17
  - Mu2 = 28
  - Sigma = 3

- Exercise 2: default alpha and power
  - Mu1 = 10
  - Mu2 = 11
  - Sigma = 2

- Exercise 3: default alpha and power
  - Mu1 = 10
  - Mu2 = 11
  - Sigma = 8

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