

DCGI

DEPARTMENT OF COMPUTER GRAPHICS AND INTERACTION
CZECH TECHNICAL UNIVERSITY IN PRAGUE



Experiment Evaluation and Power Analysis - PRACTICE

SAN 2017/18

POWER ANALYSIS | DISCOVERY

- To detect X % of problems that affects Y % of users.
- To have a X % chance of detecting ...

$$n = \frac{\ln(1 - X)}{\ln(1 - Y)}$$

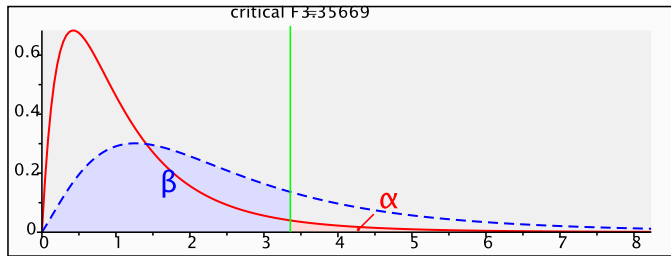
$$n = 16$$

$$\text{chance} = 95 \%$$

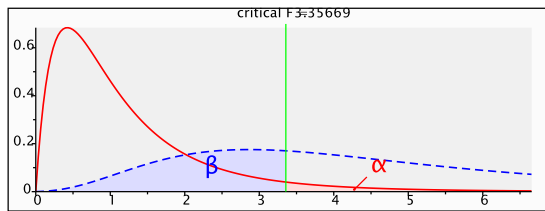
$$\text{rareness} = Y \%$$

POWER ANALYSIS | COMPARING

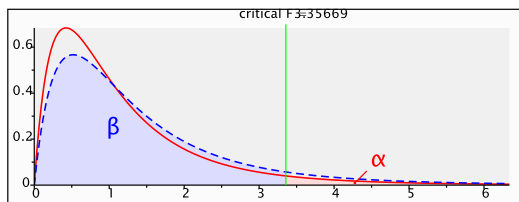
F test (MANOVA: Repeated measures, within factors)



$\alpha = 0.05$
 $\beta = 0.73$ for $\beta = 0.2, n = 44$
 $f = 0.25$ (medium)
 $n = 16$



$\alpha = 0.05$
 $\beta = 0.37$ for $\beta = 0.2, n = 22$
 $f = 0.4$ (large)
 $n = 16$



$\alpha = 0.05$
 $\beta = 0.92$ for $\beta = 0.2, n = 244$
 $f = 0.1$ (small)
 $n = 16$

EXPERIMENT RESULTS

F test (MANOVA: Repeated measures, within factors)

EXPERIMENT RESULTS

F test (MANOVA: Repeated measures, within factors)

EXPERIMENT RESULTS

INSTRUCTIONS FOR 2ND PART

Analyze the data gathered on the 1st practice (see <https://goo.gl/DC9hVJ>). The report should contain:

- statistical analysis of data reporting
 - H_0/H_1 rejection/acceptance
 - group effect, asymmetric learning effect
 - learning curve across trials
 - compare learning curve of method A and B
 - how to determine number of trials when the method A will become faster than method B
- power analysis of the experiment setup
 - compute and discuss optimal parameters (power, effect size, α , n) for such study
- determine parameters of discovery experiment
 - n , X % chance of discovering problems affecting Y % of users

THANK YOU FOR ATTENTION



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