



Analysis of Psychological Data

Lab 9. Hey Means, Don't Be Mean To Us: One-Way ANOVA

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Quantitative Methods, Measurement, and Statistics

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Reminders

Homework 3 & 4 due today (57 points)

Exam 2 is next Tuesday (November 2)

Prepare the correct scantron form (large red one; see next slide)

Print z-, t-, and F-table

Bring calculator, notes, pencil, eraser, and pen



Reminders

Correct scantron form (otherwise, you will get a score of 0)

The image shows two scantron forms side-by-side, highlighting correct and incorrect ways to fill them out.

Left Form (Incorrect):

- INSTRUCTOR:** Only write your lab section number or TA's name in this area.
- CLASS:** Leave this blank.
- HOUR/DAY:** Leave this blank.
- DIRECTIONS:** MAKE DARK MARKS • ERASE COMPLETELY TO CHANGE
EX.
- ID NUMBER:** 100098765
- PHONE NUMBER:** LEAVE THIS BLANK
- LAST NAME:** CARLOS
- FIRST NAME:** JOSE
- M.I.:** LEAVE THIS BLANK

A red arrow on the left edge of the form points upwards, labeled "FEED THIS DIRECTION".

Right Form (Correct):

- ID NUMBER:** 100098765
- TEST FORM:** 001
- DIRECTIONS:** You will have 50 multiple choice questions. Answer them here.
T F 101 T F 102 T F 103 T F 104 T F 105 T F 106 T F 107 T F 108 T F 109 T F 110 T F 111 T F 112 T F 113 T F 114 T F 115 T F 116 T F 117 T F 118 T F 119 T F 120 T F 121 T F 122 T F 123 T F 124 T F 125 T F 126 T F 127 T F 128 T F 129 T F 130 T F 131 T F 132 T F 133 T F 134 T F 135 T F 136 T F 137 T F 138 T F 139 T F 140 T F 141 T F 142 T F 143 T F 144 T F 145 T F 146 T F 147 T F 148 T F 149 T F 150 T F
- TEST FORM:** This information will be shown on the first page of your exam sheet
- EXAM #:** 001



What are we going to do?

Recap to give you a big picture

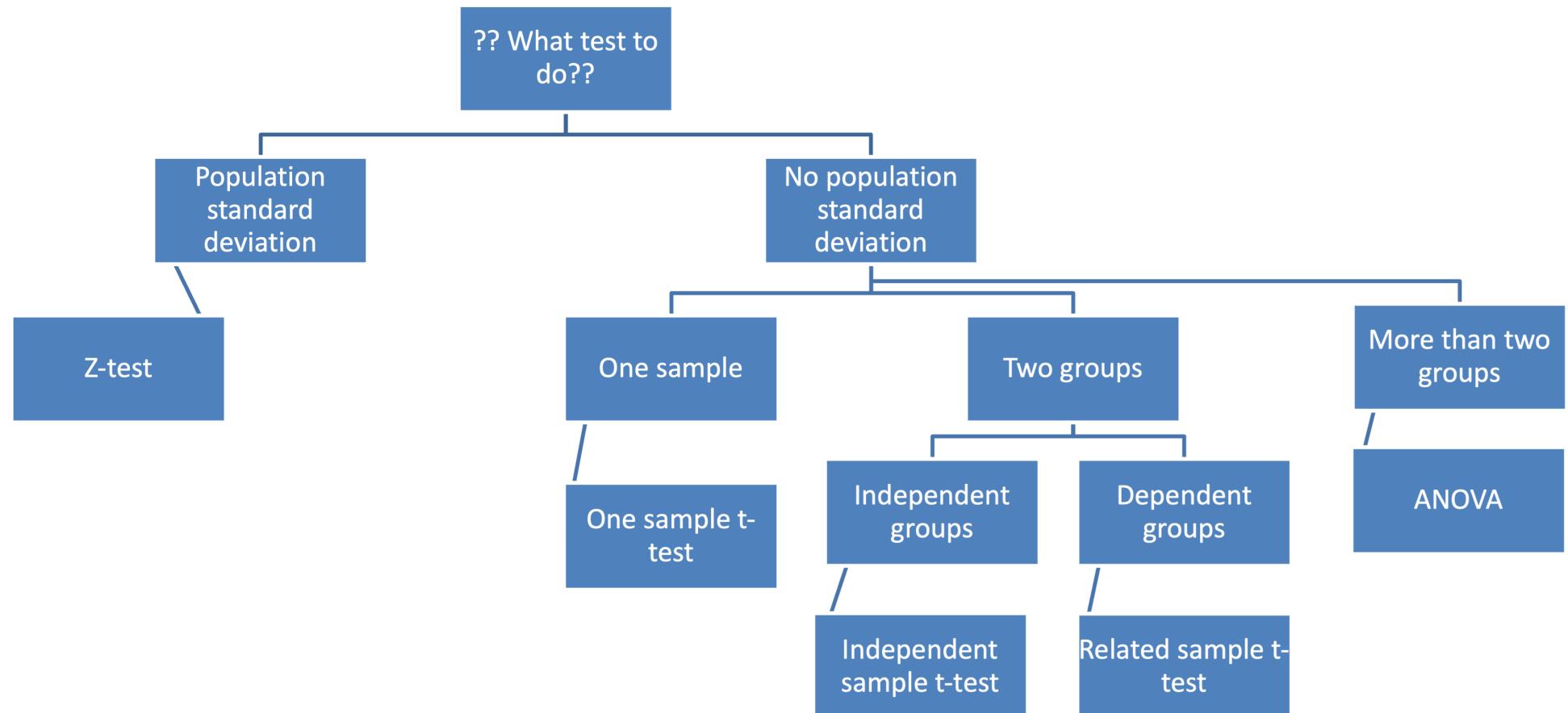
Brief summary

Effect size in one-way ANOVA

Ask me any questions



Big picture





Big picture

Read the question carefully

Which statistical technique?

One-tailed or two-tailed?

Test-statistic

Critical value from the table

Effect size



One-way ANOVA

Effect size

$$\eta^2 = \frac{SS_{between}}{SS_{total}}$$

Magnitude of the between group effect

Compares the size of the variance between groups with the total variance

~% of the variance in the DV is explained by the IV



One-way ANOVA

A pharmaceutical company conducts an experiment to test the effect of new cholesterol medication. The company selects 15 subjects randomly from a larger population. Each subject is randomly assigned to one of three treatment groups. Within each treatment group, subjects receive a different dose of the new medication. In Group 1, subjects receive 0 mg/day; in Group 2, 50 mg/day; and in Group 3, 100 mg/day. After 30 days, doctors measure the cholesterol level of each subject. The results for all 15 subjects appear in the table below:

Dosage		
Group 1, 0 mg	Group 2, 50 mg	Group 3, 100 mg
210	210	180
240	240	210
270	240	210
270	270	210
300	270	240



One-way ANOVA

In conducting this experiment, the experimenter had two research questions

1. Does dosage level have a significant effect on cholesterol level? (hypothesis testing) $\alpha=0.05$
2. How strong is the effect of dosage level on cholesterol level? (effect size calculation)

Fill in the table

Source	SS	df	MS	F
BG				
WG				
Total				



One-way ANOVA

Fill in the table

Source	SS	df	MS	F
BG	6240	2	3120	4.16
WG	9000	12	750	
Total	15240	14		

1. Does dosage level have a significant effect on cholesterol level? (hypothesis testing) $\alpha=0.05$

$F_{crit}(2, 12) = 3.89 \rightarrow$ reject the null hypothesis



One-way ANOVA

Fill in the table

Source	SS	df	MS	F
BG	6240	2	3120	4.16
WG	9000	12	750	
Total	15240	14		

2. How strong is the effect of dosage level on cholesterol level? (effect size calculation)

$$\eta^2 = \frac{SS_{between}}{SS_{total}} = \frac{6240}{15240} = 0.41$$

41% of the variance in the cholesterol level is explained by the new medication methods



Ask me any questions





Thanks! Good luck with your exam!

