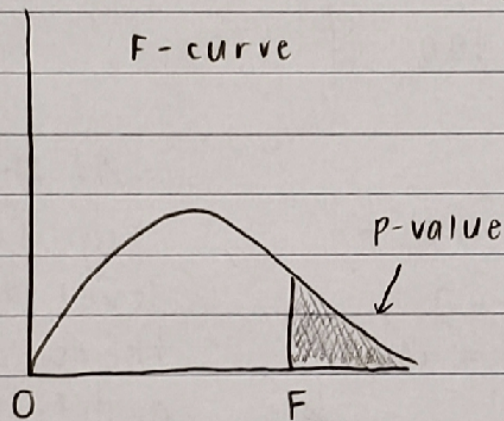


generalization of the
pooled t-procedure for comparing
↑ the means of 2 populations

12/10

16.2 One Way ANOVA: The Logic

- ANOVA stands for Analysis of Variance
- We will use it to test the means of 3 or more populations
- ANOVA is an extension of the 2-SampTTest, but it limits the possibility of a Type I error to the significance level, α
- The test statistic is F
- F is a ratio where $F = \frac{\text{variation in } \bar{x}_s}{\text{variation in all data}}$



16.3 One - Way ANOVA: The Procedure

Assumptions for ANOVA Test:

- ① Simple random samples
- ② Independent samples
- ③ Normally distributed
- ④ Assume equal population standard deviation

$H_0: \mu_1 = \mu_2 = \mu_3$ (if 3 populations)

H_a : Not all means are = (at least one mean is dif.)

if $p\text{-value} \leq \alpha$, reject H_0

Find p-value using: STAT, TESTS, ANOVA, ANOVA (L_1, L_2, L_3)

16.48 (pg 716)

Number of ★s and running time of movie (minutes)

L_1	L_2	L_3	L_4
1-1.5 ★	2-2.5 ★	3-3.5 ★	4 ★
75	97	101	101
95	70	89	135
84	105	97	93
86	119	103	117
58	87	86	126
85	95	100	119

$$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4$$

H_a : Not all means are =

ANOVA (L_1, L_2, L_3, L_4)

$$p\text{-value} = 0.003 \leq .01 = \alpha$$

reject H_0

yes; it appears the mean times are different based on star rating

At the 1% significance level, does there appear a difference in the means based on ★ ratings?

16.51 (pg 716)

strain of bacteria, bacteria counts (in millions)

A	B	C	D	E
9	3	10	14	33
27	32	47	18	43
22	37	50	17	28
30	45	52	29	59
16	12	26	20	31

At the 5% level, does there appear to be a difference in mean bacteria counts among the different strains?