

Problem Set 4.1: Critical Value

Criterion: Explain the relationship between k and power based on calculated k values.

Instructions: Read the following and answer the questions.

Work through the following and write down what you see in the F -table. This will help familiarize you with the table.

The F -table: The degrees of freedom for the numerator ($k - 1$) are across the columns; the degrees of freedom for the denominator ($N - k$) are across the rows in the table. A separate table is included for a .05 and .01 level of significance.

Increasing the levels of the independent variable (k):

Suppose we have a sample size of 24 participants ($N = 24$). Record the critical values given the following values for k :

	.05	.01
$k = 2$	—	—
$k = 4$	—	—
$k = 6$	—	—
$k = 8$	—	—

As k increases (from 1 to 8), does the critical value increase or decrease? Based on your answer, explain how k is related to power.

D	E	F	G	H	I	J	K
	Anova: Single Factor						
	SUMMARY						
	Groups	Count	Sum	Average	Variance		
	High	5.0	43.0	8.6	5.8		
	Moderate	5.0	34.0	6.8	3.7		
	Low	5.0	31.0	6.2	3.7		
	ANOVA						
	Source of Variation	SS	Df	MS	F	P-value	F Crit
	Between Groups	15.60	2.00	7.80	1.77	0.21	3.89
	Within Groups	52.80	12.00	4.40			
	Total	68.40	14.00				

Problem Set 4.4: One-way ANOVA Results in APA Style

Criterion: Report ANOVA results in APA format.

Data: Use the results from Problem Set 4.3

Instructions: Complete the following:

- a. State the null hypothesis. _____
- b. Report your results in APA format (as you might see them reported in a journal article).

Problem Set 4.5: Interpret ANOVA Results

Criterion: Interpret the results of an ANOVA.

Instructions: Read the following and answer the question.

Data: Life satisfaction among sport coaches. Drakou et al. (2006) tested differences in life satisfaction among sport coaches. They tested differences by sex, age, marital status, and education. The results of each test in the following table are similar to the way in which the data were given in their article.

Independent Variables	Life Satisfaction			
	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
Sex			0.68	.409
Men	3.99	0.51		
Women	3.94	0.49		
Age			3.04	.029
20s	3.85	0.42		
30s	4.03	0.52		
40s	3.97	0.57		
50s	4.02	0.50		
Marital status			12.46	.000
Single	3.85	0.48		
Married	4.10	0.50		
Divorced	4.00	0.35		
Education			0.82	.536
High school	3.92	0.48		
Postsecondary	3.85	0.54		
University degree	4.00	0.51		
Masters	4.00	0.59		

1. Which factors were significant at a .05 level of significance? _____
State the number of levels for each factor. _____
-
-

ANOVA ▾

ANOVA - Fat Grams Consumed

Cases	Sum of Squares	df	Mean Square	F	p
Stress Level	15.600	2	7.800	1.773	0.212
Residuals	52.800	12	4.400		

Note. Type III Sum of Squares

Descriptives

Descriptives - Fat Grams Consumed

Stress Level	N	Mean	SD	SE	Coefficient of variation
High	5	8.600	2.408	1.077	0.280
Low	5	6.200	1.924	0.860	0.310
Moderate	5	6.800	1.924	0.860	0.283

Post Hoc Tests

Standard

Post Hoc Comparisons - Stress Level

		Mean Difference	SE	t	P _{Tukey}
High	Low	2.400	1.327	1.809	0.208
	Moderate	1.800	1.327	1.357	0.393
Low	Moderate	-0.600	1.327	-0.452	0.894

Note. P-value adjusted for comparing a family of 3

Problem Set 4.7: Tukey HSD Interpretation

Criterion: Interpret Tukey HSD results from JASP output.

Data: Use your output from Problem Set 4.6.

Instructions: Identify where significant differences exist at the .05 level between the stress levels.

Chi-Square Tests

Problem Set 4.8: Critical Values

Criterion: Explain changes in critical value based on calculations.

Instructions: Read the following and answer the questions.

The chi-square table. The degrees of freedom for a given test are listed in the column to the far left; the level of significance is listed in the top row to the right. These are the only two values you need to find the critical values for a chi-square test.

Work through the following exercise and write down what you see in the chi-square table. This will help familiarize you with the table.

Increasing k and α in the chi-square table:

1. Record the critical values for a chi-square test, given the following values for k at each level of significance:

	.10	.05	.01
$k = 10$	___	___	___
$k = 16$	___	___	___
$k = 22$	___	___	___
$k = 30$	___	___	___

Note: Because there is only one k given, assume this is a goodness-of-fit test and compute the degrees of freedom as $(k - 1)$.

2. As the level of significance increases (from .01 to .10), does the critical value increase or decrease? Explain. _____
3. As k increases (from 10 to 30), does the critical value increase or decrease? Explain your answer as it relates to the test statistic. _____

