PSY 6290, Exam 2b **Printed Name: _____**

(DUE: Tuesday, March 18 @ 2:40) **Signature: _____**

Collaboration with anyone is considered academic misconduct and will be treated as such.

A researcher conducted a controlled experiment on alcohol consumption. Seventy-five college students were randomly assigned to consume one of five alcohol conditions (no drinks, 1 drink, 2 drinks, 3 drinks, 4 drinks). Then, the college students consumed the alcohol one hour prior to playing a driving simulation game on the computer. The researcher recorded the number of crashes per student. The descriptive statistics are reported below.

What tests of trend are *possible* for this researcher?

What tests of trend are *recommended* for this researcher?

A researcher wants to compare 7 groups using a one-way anova analysis.

A1	A2	A3	A4	A5	A6	A7

- How many pairwise comparisons are *possible* with 7 groups?

- What is the experimentwise error rate if all possible pairwise comparisons are conducted using an alpha of .05 **per test**?

- What is the recommended **total** sample size for this design if the researcher wants .80 power, plans to use an alpha of .05, and expects a small effect?

A researcher randomly assigned participants to one of three viewing conditions. Each participant was asked to read aloud words that were shown on a monitor. Participants received the same word list; only the type of monitor was manipulated. The researcher recorded the average length of time the participants watched the monitor before averting their gaze.

Table 2
Descriptive Statistics for Gaze Length (seconds)

	CRT	LCD	PLASMA	Total
M	95	85	120	100
SD	10	20	28	25.15
VAR	100	400	784	632.60
n	18	18	18	54

Conduct the appropriate analyses to determine whether type of monitor is a significant predictor of gaze length. As a follow-up, address how gaze length is related to monitor type. Use a familywise alpha of .05. Show your work. For each analysis, write a sentence that interprets the results.

A researcher randomly assigned participants to one of six viewing conditions. Each participant was asked to read aloud words that were shown on a monitor. Participants received the same word list; only the background color of the screen was manipulated. The researcher recorded the average length of time the participants watched the monitor before averting their gaze.

Table 1

Descriptive Statistics for Gaze Length (seconds)

	Red	Blue	Yellow	Purple	Orange	Green
M	15	35	5	20	30	45
SD	2	6	1	5	5	3
VAR	4	36	1	25	25	9
n	10	10	10	10	10	10

The researcher determined that screen color was a significant predictor of gaze length. As a follow-up, three tests were performed to evaluate the following hypotheses:

1. Gaze length in the purple condition will equal the average of the gaze length in the red and blue conditions. The *F* value was 7.14 with *df* = 16.
2. Gaze length in the orange condition will equal the average of the gaze length in the red and yellow conditions. The *F* value was 152.38 with *df* = 10.
3. Gaze length in the green condition will equal the average of the gaze length in the blue and yellow conditions.

Calculate the F value and the *df* for the third hypothesis. Show your work.

Determine whether hypotheses 1 and 2 are orthogonal. Show your work.

Determine whether hypotheses 1, 2, and 3 are significant using the Bonferroni Method. Report the critical value used.

	Stats	**Critical Value**	**Results**		
Hypothesis 1	*F* = 7.14, *df* = 16		Is purple equal to the average of red and blue?	YES	NO
Hypothesis 2	*F* = 152.38, *df* = 10		Is orange equal to the average of red and yellow?	YES	NO
Hypothesis 3			Is green equal to the average of blue and yellow?	YES	NO

Determine whether hypotheses 1, 2, and 3 are significant using the Brown & Forsythe Method. Report the critical value used.

	Stats	**Critical Value**	**Results**		
Hypothesis 1	*F* = 7.14, *df* = 16		Is purple equal to the average of red and blue?	YES	NO
Hypothesis 2	*F* = 152.38, *df* = 10		Is orange equal to the average of red and yellow?	YES	NO
Hypothesis 3			Is green equal to the average of blue and yellow?	YES	NO

Table 3
Total Debt (thousands of dollars)

		BS	MS	PHD
PRIVATE	***M***	**25**	**35**	**48**
	VAR	16	25	16
PUBLIC	***M***	**21**	**29**	**40**
	VAR	25	100	64

Note. $n = 10$ per cell.

Conduct the <u>main effect test for degree (BS, MS, PHD)</u> to determine whether the type of degree is a predictor of total debt upon graduation. Use an alpha of .05. Show your work. Write a sentence to interpret the results.

<u>Calculate and interpret</u> the omega^2 for the degree main effect test. Show your work.

Determine the PREDICTED VALUES of the full and reduced models for the DEGREE test. Show your work.

Predicted Values for the **Full Model** of the DEGREE Test						
School	Degree	Grand Mean	School Effect	Degree Effect	Interaction Effect	**Predicted *Y***
Private	BS					
Private	MS					
Private	PHD					
Public	BS					
Public	MS					
Public	PHD					

Predicted Values for the **Reduced Model** of the DEGREE Test						
School	Degree	Grand Mean	School Effect	Degree Effect	Interaction Effect	**Predicted *Y***
Private	BS					
Private	MS					
Private	PHD					
Public	BS					
Public	MS					
Public	PHD					

The Office of Institutional Research sent a survey to alumni who had graduated within the past 12 months. The survey asked alumni to indicate the college in which they received their degree (Mass Communication, Education, Business, or Science). As well, alumni were asked to rate their satisfaction with the university on a scale of 1 to 15, with higher numbers reflective of greater satisfaction.

- Write an APA results section based on the **appropriate portions** of the attached SPSS output.
- Portions of the results section have been completed for you.

Table 1
Descriptive Statistics for Satisfaction Ratings by College

CONDITION	*M*	*SD*	*n*
MassComm	4.08	2.07	12
Education	6.67	2.19	12
Sciences	7.00	3.64	12
Business	7.67	2.84	12
Total	6.35	3.00	48

Results

Descriptive statistics for alumni satisfaction are reported in Table 1. A familywise alpha of .05 was used for all analyses.

Oneway

Descriptives

RATING

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
MassComm	12	4.0833	2.06522	.59618	2.7712	5.3955	2.00	8.00
Education	12	6.6667	2.18812	.63166	5.2764	8.0569	4.00	10.00
Sciences	12	7.0000	3.64318	1.05169	4.6852	9.3148	3.00	15.00
Business	12	7.6667	2.83912	.81958	5.8628	9.4706	4.00	12.00
Total	48	6.3542	2.99993	.43300	5.4831	7.2253	2.00	15.00

ANOVA

RATING

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	88.729	3	29.576	3.893	.015
Within Groups	334.250	44	7.597		
Total	422.979	47			

Robust Tests of Equality of Means

RATING

	Statistic[a]	df1	df2	Sig.
Welch	5.203	3	24.021	.007

a. Asymptotically F distributed.

Contrast Coefficients

Contrast	CONDITION			
	MassComm	Education	Sciences	Business
1	-3	-1	1	3
2	1	-1	-1	1
3	-1	3	-3	1

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
RATING	Assume equal variances	1	11.0833	3.55823	3.115	44	.003
		2	-1.9167	1.59129	-1.204	44	.235
		3	2.5833	3.55823	.726	44	.472
	Does not assume equal variances	1	11.0833	3.27862	3.380	26.390	.002
		2	-1.9167	1.59129	-1.204	35.984	.236
		3	2.5833	3.81741	.677	20.752	.506

Post Hoc Tests

Multiple Comparisons

Dependent Variable: RATING

	(I) CONDITION	(J) CONDITION	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	MassComm	Education	-2.58333	1.12521	.115	-5.5877	.4210
		Sciences	-2.91667	1.12521	.060	-5.9210	.0877
		Business	-3.58333*	1.12521	.014	-6.5877	-.5790
	Education	MassComm	2.58333	1.12521	.115	-.4210	5.5877
		Sciences	-.33333	1.12521	.991	-3.3377	2.6710
		Business	-1.00000	1.12521	.811	-4.0043	2.0043
	Sciences	MassComm	2.91667	1.12521	.060	-.0877	5.9210
		Education	.33333	1.12521	.991	-2.6710	3.3377
		Business	-.66667	1.12521	.934	-3.6710	2.3377
	Business	MassComm	3.58333*	1.12521	.014	.5790	6.5877
		Education	1.00000	1.12521	.811	-2.0043	4.0043
		Sciences	.66667	1.12521	.934	-2.3377	3.6710
Games-Howell	MassComm	Education	-2.58333*	.86857	.033	-4.9959	-.1708
		Sciences	-2.91667	1.20892	.111	-6.3448	.5114
		Business	-3.58333*	1.01348	.010	-6.4188	-.7478
	Education	MassComm	2.58333*	.86857	.033	.1708	4.9959
		Sciences	-.33333	1.22680	.993	-3.8002	3.1336
		Business	-1.00000	1.03475	.770	-3.8881	1.8881
	Sciences	MassComm	2.91667	1.20892	.111	-.5114	6.3448
		Education	.33333	1.22680	.993	-3.1336	3.8002
		Business	-.66667	1.33333	.958	-4.3867	3.0533
	Business	MassComm	3.58333*	1.01348	.010	.7478	6.4188
		Education	1.00000	1.03475	.770	-1.8881	3.8881
		Sciences	.66667	1.33333	.958	-3.0533	4.3867

*. The mean difference is significant at the .05 level.

Homogeneous Subsets

RATING

	CONDITION	N	Subset for alpha = .05	
			1	2
Tukey HSD[a]	MassComm	12	4.0833	
	Education	12	6.6667	6.6667
	Sciences	12	7.0000	7.0000
	Business	12		7.6667
	Sig.		.060	.811

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 12.000.