ID# _____ Final Exam PS 217, Spring 2002
(You must use your Skidmore ID#!)

OK, here's the last stats exam…the one that you've been anxiously awaiting. As always, you should adhere to the Skidmore Honor Code. Answer each question completely, showing all your work.

I look forward to seeing many of you in Experimental next semester. Have a wonderful summer!

1. Dr. Tori Ador was interested in studying the impact of cape color on instigating movement in bulls. She has a professional bullfighter use one of five cape colors (red, green, blue, black, and white). The DV is the time (in seconds) between waving the cape and the bull's movement toward the bullfighter. Complete the analyses below and interpret the results as completely as you can, with careful consideration to the advice you'd give Dr. Ador based on these results. [15 pts]

ANOVA Table for Time to Charge

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Cape Color		.560			.9207	.903	.089
Residual		12.400					

Means Table for Time to Charge
Effect: Cape Color

	Count	Mean	Std. Dev.	Std. Err.
Black	5	2.000	.707	.316
Blue	5	2.200	.837	.374
Green	5	2.000	.707	.316
Red	5	2.200	.837	.374
White	5	1.800	.837	.374

2a. Dr. Randy Mann is interested in the relationship between the number of sexual partners a person has had and the extent to which that person is satisfied with his or her life. He interviews a dozen people, asking about the number of sexual partners the person has had and assessing happiness using the Satisfaction in Ordinary Life Events scale (1-10, with 1 = Unhappy and 10 = Happy). The data are shown below. Analyze the data and interpret the results as completely as you can. [15 pts]

	Partners	SOLE
	0	1
	2	8
	5	2
	1	3
	3	9
	2	6
	7	1
	1	3
	3	7
	2	8
	6	2
	4	5
Sum	36	55
Mean	3.0	4.583
SS	50	94.9

2b. Suppose that you convert every person's sexual partner score to a z score. Answer the following questions about the z scores. [5 pts]

The mean of the distribution of z scores would be:

The standard deviation of the distribution of z scores would be:

A person with 3 sexual partners (presumably not all at once) would have a z score of:

A person with 6 sexual partners (don't even think about it) would have a z score of:

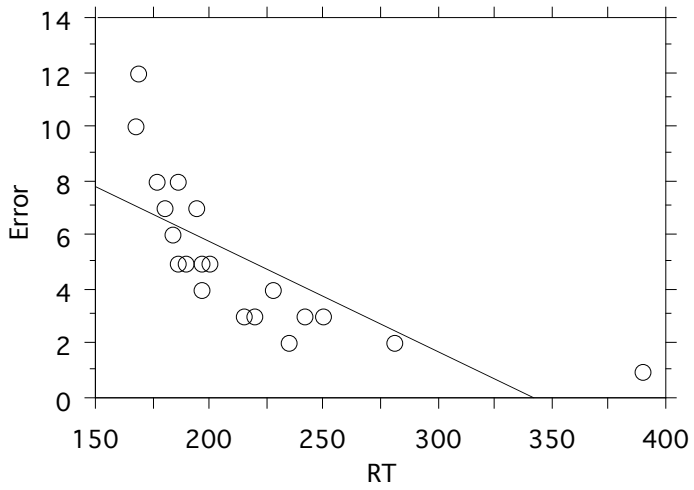
What percentage of people would have more than 3 sexual partners?

3. Researchers who measure reaction time (RT) for human participants often observe a relationship between the RTs and the number of errors that participants commit. This relationship is known as the *speed-accuracy trade-off*. In the data below, 20 participants were shown computer screens filled with the letter E. Some of the letters were in the usual orientation and some of the letters were backward. Participants are told to assess the number of backward E's as quickly as possible. The average number of backward letters missed over 10 trials constituted the mean number of errors. The average response time on each trial (in milliseconds) constituted the other variable. Interpret the results of the study as completely as you can. How many errors would you predict a person would make who responded with a RT of 200 milliseconds? How many errors would you predict a person would make who responded with a RT of 500 milliseconds? How much of the variability in errors is shared with RT? [10 pts]

Regression Summary
Error vs. RT

Count	20
Num. Missing	0
R	.724
R Squared	.524
Adjusted R Squared	.498
RMS Residual	2.007

Regression Plot



Y = 13.774 - .04 * X; R^2 = .524

ANOVA Table
Error vs. RT

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	80.012	80.012	19.855	.0003
Residual	18	72.538	4.030		
Total	19	152.550			

Regression Coefficients
Error vs. RT

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	13.774	1.987	13.774	6.933	<.0001
RT	-.040	.009	-.724	-4.456	.0003

4a. Dr. Luke Attem was interested in factors that influence memory for faces. During the acquisition phase, participants were shown a series of 60 computer-generated male faces one at a time for 30 seconds each. Fifteen of the faces wore sunglasses, fifteen of the faces had full beards, fifteen of the faces wore hats, and fifteen of the faces were unadorned (no glasses, beard, hat, etc.). Each type of face occurred equally often within portions of the acquisition phase, to control for any position bias. (Note that the random ordering of the faces serves the same function as counterbalancing.) At test, 120 "unadorned" faces were presented, 60 new faces and the 60 original faces. That is, regardless of how the face was seen at acquisition, it was seen unadorned at test (no sunglasses, beard, or hat). The dependent variable was the percentage of faces of each type correctly recognized (100% indicating perfect recognition). Complete the analysis below and interpret the results of this experiment as completely as you can. [10 pts]

ANOVA Table for Acq Face

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Subject		7041.490					
Category for Acq Face		5554.281			<.0001	791.063	1.000
Category for Acq Face * Subject		484.469					

Means Table for Acq Face
Effect: Category for Acq Face

	Count	Mean	Std. Dev.	Std. Err.
Unadorned	24	60.167	9.867	2.014
Sunglasses	24	41.417	9.007	1.839
Beard	24	44.583	8.423	1.719
Hat	24	55.042	8.819	1.800

4b. Given the data above, how likely is it that the sample of n=24 who saw unadorned faces at both acquisition and test were sampled from a population with $\mu = 65$? [10 pts]

5. Individuals who are identified as having an antisocial personality disorder also tend to have reduced physiological responses to painful or anxiety-provoking stimuli. In everyday terms, these individuals show a limited physical response to fear, guilt, or anxiety. One way of measuring this response is with the galvanic skin response (GSR). With GSR, higher scores indicate lower responsivity and lower GSR scores indicate greater responsivity. In the study summarized below, three groups of individuals were tested: Normal Personality, Antisocial Personality, and Agoraphobics. First, briefly tell me why a group of Agoraphobics (or some other clinically diagnosed group) would be included in such a study:

As you can see, a third of each group is given the GSR under ordinary circumstances (baseline), a third is given a moderately stressful situation, and a third is given a highly stressful situation. Complete the source table and interpret the results of this study as completely as you can. [20 pts]

ANOVA Table for GSR

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Group				34.5	<.0001	69.076	1.000
Stress				26.6	<.0001	53.222	1.000
Group * Stress				9.3	<.0001	37.311	1.000
Residual			6.0				

Means Table for GSR
Effect: Group * Stress

	Count	Mean	Std. Dev.	Std. Err.
Agoraphobic, 1Baseline	7	19.857	2.116	.800
Agoraphobic, 2Moderate	7	17.000	1.633	.617
Agoraphobic, 3High	7	13.714	1.113	.421
Antisocial, 1Baseline	7	22.000	3.109	1.175
Antisocial, 2Moderate	7	22.429	2.637	.997
Antisocial, 3High	7	22.429	2.225	.841
Normal, 1Baseline	7	21.857	2.410	.911
Normal, 2Moderate	7	17.429	4.117	1.556
Normal, 3High	7	11.000	1.414	.535

6. Do blondes really have more fun? To answer this intriguing question, Dr. Vanna Cream asks 20 people to rate how much fun they are having (on a scale of 1-10). Five of the participants have blonde hair, five have red hair, five have black hair, and five have brunet hair. Analyze the data below as completely as possible to address this question. If you are not blonde, would you dye your hair blonde based on the results of this study? Why or why not? [20 pts]

	Blonde	Red	Black	Brunet
	8	6	5	4
	9	5	4	5
	7	6	7	4
	8	7	6	5
	7	6	5	3
$\sum X$ (T)	39	30	27	21
$\bar{X}$	7.8	6.0	5.4	4.2
SS	2.8	2.0	5.2	2.8