

AS1: Assignment 1, ANOVA

RESEARCH SCENARIO:

1. A randomized study was conducted comparing the effects of repetition on recall. Conditions included the following number of repetitions per list of words: 5 times, 10 times, 15 times, and 20 times.
 - (a) What is (are) the factor(s) in this study? __number of repetitions per list of words__
 - (b) How many levels (if any) does (do) the factor(s) have? __4 levels__
 - (c) What is the dependent variable? _____ recall_____
2. What is the research design? __Analysis Of Variance (ANOVA)_____
3. What is the appropriate hypothesis test to analyze these data? _____F-ratio: (one-way independent measures ANOVA)_
Ho: There is no effect of repetition on recall
H1: there is an effect of repetition on recall _____
4. In which source of variance would you expect the treatment effect? _____ the between treatment variance (the values use to describe the differences of means)_____

Below is an SPSS ANOVA: Based on these results, please answer a-f

ANOVA

VAR00001

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16.267	2	8.133		.007
Within Groups	37.100	27	1.374		
Total	53.367	29			

Multiple Comparisons

Dependent Variable: VAR00001

Bonferroni

(I) VAR00002	(J) VAR00002	Mean Difference (I- J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-1.00000	.52423	.201	-2.3381	.3381
	3.00	-1.80000*	.52423	.006	-3.1381	-.4619
2.00	1.00	1.00000	.52423	.201	-.3381	2.3381
	3.00	-.80000	.52423	.416	-2.1381	.5381
3.00	1.00	1.80000*	.52423	.006	.4619	3.1381
	2.00	.80000	.52423	.416	-.5381	2.1381

*. The mean difference is significant at the 0.05 level.

(a) What is the value of the variance between? _____ 8.133 _____

(b) What is the value of the variance within? _____ 1.374 _____

(c) What is the F value (I know it is not there, calculate it): _____ 5.919 _____

(d) Please write the statistical statement for the above SPSS ANOVA results:

Answer: _____ F (2,27)=5.919, p=.007 _____

(e) Is your F test significant? Yes v No _____

(f) If yes, please note where the significance is found:

_____ The data indicate significant differences between the 5 times and the 15 times conditions. However there is no statistically significant difference between 5 times and the 10 times groups, nor 10 times and the 15 times groups. _____

RESEARCH SCENARIO 2:

A researcher hypothesizes that exam performance is affected by the amount of time that a student reviews the quiz material immediately prior to the quiz. He randomizes his sample of n=30 participants to a 10 minutes condition, a 20 minutes condition, and a 30 minutes condition, after which all students take the quiz. The data are below:

10 m	20 m	30 m
86	94	92
78	91	91
55	82	68
88	15	65
77	85	78
65	72	81
60	78	83
64	74	69
72	70	74
84	83	83

1. What is the factor in this study? __amount of time that a student reviews the quiz material immediately prior to the quiz__
2. What is the dependent variable in this study? __ student exam performance_____
3. What is the research hypothesis? __student's exam performance is effected by the amount of time that a student reviews the quiz material immediately prior to quiz.____
4. What is the null hypothesis?
__performance is not significantly affected by the amount of time that a student reviews the quiz material immediately prior to quiz.____
5. What is the name of the research design? _____Analysis Of Variance (ANOVA)_____

6. Run the appropriate SPSS test and cut and paste your SPSS results here:

Descriptives

VAR00001

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	10	72.9000	11.52244	3.64372	64.6573	81.1427	55.00	88.00
2.00	10	74.4000	22.28702	7.04777	58.4568	90.3432	15.00	94.00
3.00	10	78.4000	9.35949	2.95973	71.7046	85.0954	65.00	92.00
Total	30	75.2333	15.10351	2.75751	69.5936	80.8731	15.00	94.00

ANOVA

VAR00001

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	161.667	2	80.833	.338	.716
Within Groups	6453.700	27	239.026		
Total	6615.367	29			

Post Hoc Tests

Multiple Comparisons						
Dependent Variable: VAR00001						
Scheffe						
(I) VAR00002	(J) VAR00002	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-1.50000	6.91413	.977	-19.4078	16.4078
	3.00	-5.50000	6.91413	.731	-23.4078	12.4078
2.00	1.00	1.50000	6.91413	.977	-16.4078	19.4078
	3.00	-4.00000	6.91413	.847	-21.9078	13.9078
3.00	1.00	5.50000	6.91413	.731	-12.4078	23.4078
	2.00	4.00000	6.91413	.847	-13.9078	21.9078

7. Based on your SPSS results, what is MS between? 80.833

8. Based on your SPSS results, what is MS within? 239.026

9. What is the F value? 0.338

10. Please write the “statistical statement” for your SPSS analysis:

Answer: F(2,27)=0.338, p=.716

11. Were your results significant? Yes _____ No v_____

12. If yes, which groups showed a statistical difference?

Interpretation: The data failed to reach significance. There were no groups that were significantly difference from each others .