

Third Arts, Second Semester Examination, 1999 - 2000

Psychology, Paper 4

PS238 Experimental Psychology, Research Methods, and Psychological Statistics IV
(Unit value 2.0)

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Time allowed: Two hours

Answer three questions. Answer two questions from Section A and one question from Section B
(Candidates will be provided with the necessary statistical tables and formulae.)

SECTION A - Statistics

1. A within-subjects experiment was carried out to investigate factors affecting the detection of patterns on a screen. The independent variables (IVs) were Shape (circle, square or triangle) and Solidity (outline or solid). The dependent variable (DV) was the number of errors made. The results of a 2-way repeated measured ANOVA are reported below:

Table 1 – Results of a 2x3 repeated measures ANOVA

Source of variance	Sums of squares SS	DF	Mean Squares (MS)	F Ratios	P
Var A (Shape)	X	2	X	X	X
Var. B (Solidity)	112	1	X	X	X
S (subjects)	114	5	X	X	X
AxB	144	X	X	X	X
Error AS	12	9	X		
Error BS	31.33	13	X		
Error ABS	224	9	X		
Total	661.33	55			

Table 2 – means of the 6 conditions in the related 2-way ANOVA.

Shape	Solidity	
	Solid	Outline
Circle	$\bar{X} = 2$	$\bar{X} = 3$
Square	$\bar{X} = 4$	$\bar{X} = 6$
Triangle	$\bar{X} = 9$	$\bar{X} = 9$

- (i) Compute the missing values (i.e. where there is an X) in Table 1 and interpret the results.

(70%)

- (ii) Draw a graph of the interaction effects of solidity by shape on number of errors

(30%)

2. A study was carried out to examine the effects of practice on ability to solve anagrams. Six participants were asked to solve as many anagrams as possible in a ten-minute period, before practice, after one hour of practice and again after two hours of practice. The results are reported below:

Subject	Control (no practice)	1 hour practice	2 hours practice
1	7	9	10
2	5	10	11
3	10	12	13
4	4	6	6
5	3	7	8
6	6	9	10

- (i) Carry out a one-way repeated measures ANOVA and interpret the results (using a post-hoc test where appropriate) (100%)
3. The number of patients presenting to the Accident and Emergency Unit of a hospital during consecutive 3-hour periods of 12-hour night shift were as follows:

20.00-22.59	23.00-01.59	02.00- 04.59	05.00-08.00
1	4	10	19
3	5	9	21
2	6	12	18
2	5	13	18
2	7	11	17

- (i) Test the hypothesis that the later at night, the more people present for emergency treatment. (70%)
- (ii) Outline, in brief, the key differences and similarities between the Jonckheere Trend test and the Page's L Trend test. (30%)

4. Write notes on three of the following:

- Different types of multiple regression
- Nested design versus a crossed design in Analysis of Variance
- Power of a statistical test
- Criteria of hypotheses
- Controversies in the use of ANOVA

(100%)

SECTION B-Research Methods

- Critically evaluate the contribution of Eastern and Western thinkers to the study of Psychology from the period 1120 to 300 B.C.
- "The study of Psychology as a science requires flexible shifts in thinking from Positivism to Constructivism".
Discuss this statement in light of recent research developments and trends in Psychology.
- Critically evaluate the attached article: '*Comparative Effectiveness of Teacher Management Styles in a Fifth Grade Classroom*'.