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Ollscoil na hÉireann, Gaillimh

NATIONAL UNIVERSITY OF IRELAND, GALWAY

2BA Psychology and Higher Diploma in Psychology (Conversion)
Semester 2 Examination, 2004-2005

PS405 Advanced Research Methods in Psychology (5.0 ECTS)

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Time allowed: ***Two hours***

Answer two questions from Section A and one question from Section B.
All questions carry equal marks.

SECTION A – Statistics (Answer two questions from this section)

1. The following is a table of results from the analysis of a two-way independent ANOVA on the effects of gender and coping style (avoidant/vigilant) on ratings of pain (Table 1). Table 2 contains the mean pain ratings for each of the four conditions.

Table 1 – Results of a two-way independent ANOVA on the effects of gender and coping style on pain ratings

Source of variance	Sum of squares (SS)	df	Mean Squares (MS)	F Ratios	p
Var. A (Gender)	**58.23**	1	58.83	38.98	**<0.01**
Var. B (Coping style)	29.44	1	29.44	**20.44**	**<0.01**
AxB	36.02	1	30.02	**23.45**	**<0.01**
Within (Error)	28.13	29			
Total		32			

Table 2 – Mean pain ratings in each of the 4 conditions.

	Coping style	
Gender	Avoidant	Vigilant
Male	34.11	42.34
Female	29.93	57.21

Write up the results of this ANOVA in a style consistent with that recommended by the American Psychological Association (APA), including in your results a graph of the interaction between gender and coping style on pain ratings. (100%)

2. (a) What are the assumptions of multiple linear regression? (10%)

(b) Outline the similarities and differences between standard and hierarchical multiple regression. (30%)

(c) A hierarchical multiple regression was conducted to examine the influence of the Theory of Planned Behaviour (TPB) factors (subjective norm, attitude and perceived behavioural control) on intention to exercise. Age was controlled for in the first step, and the TPB variables were entered on the second step. The SPSS results are presented below.

Model Summary

Model	R	R Square	Adjusted R Square	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
1	.081[a]	.007	.006	.007	6.174	1	931	.013
2	.609[b]	.371	.369	.365	179.437	3	928	.000

a. Predictors: (Constant), age

b. Predictors: (Constant), AGE, SUBJECTIVE NORM, ATTITUDE, PERCEIVED BEHAVIOURAL CONTROL.

ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.932	1	4.932	6.174	.013[a]
	Residual	743.687	931	.799		
	Total	748.619	932			
2	Regression	277.954	4	69.488	137.009	.000[b]
	Residual	470.665	928	.507		
	Total	748.619	932			

a. Predictors: (Constant), age

b. Predictors: (Constant), AGE, SUBJECTIVE NORM, ATTITUDE, PERCEIVED BEHAVIOURAL CONTROL

c. Dependent Variable: INTENTION

Write up the results of this regression in a style consistent with that recommended by the American Psychological Association (APA), using a properly formatted table to summarise your results. (60%)

3. A sample of colposcopy patients was randomly assigned to either an experimental (visual information condition) or control (standard treatment) group. Patients' state anxiety was measured at each of three visits (before, during and after treatment). A mixed ANOVA was carried out on the data. The SPSS results are presented below.

Multivariate Tests[b]

Effect		Value	F	Hypothesis df	Error df	Sig.
VISIT	Pillai's Trace	.677	41.951[a]	2.000	40.000	.000
	Wilks' Lambda	.323	41.951[a]	2.000	40.000	.000
	Hotelling's Trace	2.098	41.951[a]	2.000	40.000	.000
	Roy's Largest Root	2.098	41.951[a]	2.000	40.000	.000
VISIT * GROUP	Pillai's Trace	.149	3.500[a]	2.000	40.000	.040
	Wilks' Lambda	.851	3.500[a]	2.000	40.000	.040
	Hotelling's Trace	.175	3.500[a]	2.000	40.000	.040
	Roy's Largest Root	.175	3.500[a]	2.000	40.000	.040

a. Exact statistic

b.
Design: Intercept+GROUP
Within Subjects Design: VISIT

Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	239846.211	1	239846.211	1199.047	.000
GROUP	680.630	1	680.630	3.403	.072
Error	8201.262	41	200.031		

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
state anxiety 1	Laser-video	22	52.8182	14.21815	3.03132
	laser-control	21	51.6190	12.55578	2.73990
state anxiety 2	Laser-video	22	37.8182	6.95315	1.48242
	laser-control	21	44.3810	11.09268	2.42062
state anxiety 3	Laser-video	22	31.8636	5.56601	1.18668
	laser-control	21	40.2857	7.06500	1.54171

Write up the results of this analysis in a style consistent with that recommended by the American Psychological Association (APA) and draw a graph of the interaction between visit (1, 2 and 3) and group (experimental vs control) on state anxiety. (100%)

4. Describe **three** of the following:

(a) Violation of the assumptions of ANOVA
(b) Advantages and disadvantages of stepwise multiple regression
(c) Importance of a control group in experimental design
(d) Power, effect size and sample size in research design
(e) Multi-factorial statistics in psychology.

SECTION B -- Research Methods
(Answer one question from this section)

1. What are the main threats to validity when conducting psychological research and what controls might be used to reduce these threats?

2. 'A strong experimental design is key to controlling unwanted sources of variance in psychological research'. Discuss