1. March 1/3:

A psychiatrist randomly assigns 15 manic-depressive subjects to one of 3 groups, which were administered either 0, 5, or 10 ml. of melatonin. After treatment, the subjects' scores on a measure of depression measure:

Control Group Treatment 1 Treatment 2

(0 ml.) (5 ml.) (10 ml.)

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23 16 14

17 9 7

21 13 8

25 12 12

20 15 11

1. Do the different dosages of melatonin result in significantly different measured amounts of depression? (α ≤ .01)
2. Perform post hoc Tukey tests to determine which specific groups differ significantly (still using α ≤ .01)
3. March 22/24

Thirty six subjects are randomly assigned to one of twelve groups in a study investigating the separate and joint effects of imagery instruction and imagery vividness on recall. Four kinds of imagery instruction (passive, active, reactive, and control) and three kinds of imagery vividness (low, medium, and high) are used. Following treatment, all subjects are given a 30-item recall test, yielding the following data:

Control Passive Active Reactive

Low Med High Low Med High Low Med High Low Med High

4 5 7 3 9 10 5 9 18 5 13 22

5 7 9 5 9 14 4 11 19 6 14 24

5 6 11 4 8 12 4 13 17 3 15 26

a) Fill out a complete 2-way ANOVA table and determine if the main effects for imagery instruction and imagery vividness, and the instruction x vividness interaction, are significant (each with α ≤ .05).

b) If a main effect for imagery vividness is found, perform Tukey post hoc tests to determine which means differ from one another.

1. March 29/31

Recent studies have suggested that a significant negative correlation exists between subjects' cerebral glucose metabolic rate (CGMR) and their scores on a standardized test of intelligence (IQ). That is, subjects who metabolize **less** glucose obtain **higher** IQ test scores. In an attempt to replicate this correlation, a researcher measures the CGMR of 8 young adult subjects as they work on an IQ test. The following data were obtained:

Subjects CGMR IQ

1 .70 114

2 1.50 101

3 -1.01 133

4 -.14 128

5 .13 111

6 .85 92

7 -1.47 122

8 -.56 107

a) Has this study successfully replicated a significant negative correlation between CGMR and IQ (α = .05, 2-tailed)?

1. April 5/7

You wish to predict the reading achievement (Y) of 10th graders using two predictor variables: verbal aptitude (X1) and achievement motivation (X2). You obtain data on these 3 variables from a random sample of 20 students in 10th grade. Here are their scores:

Y X1 X2

2 1 3

4 2 5

4 1 3

1 1 4

5 3 6

4 4 5

7 5 6

9 5 7

7 7 8

8 6 4

5 4 3

2 3 4

8 6 6

6 6 7

10 8 7

9 9 6

3 2 6

6 6 5

7 4 6

10 4 9

Using SPSS run a multiple regression to predict Y using X1 and X2 as the predictors. From the output, report the overall R2 and its associated F value. Also report the unstandardized and standardized regression coefficients associated with each of the predictor variables and their associated t values. Finally, write a short report summarizing the results and indicate which of the two predictors is accounting for the largest amount of the variance over and above the other.

Overall R2 = .723, F = 22.18; unstandardized b1 = .7046 (t = 4.02), unstandardized b2 = .5919 (t = 2.43); standardized beta1 = .602, standardized beta2 = .364.

1. April 12/14

A hospital keeps a record of the number of males and females in different age groups who contract a particular disease. The data are summarized as follows:

Age Groups

10-25 26-40 41-55 56 +

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Male 23 34 64 29

Female 20 31 55 44

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Are gender and age of contracting the disease independent of one another (α ≤ .05)?

Answers:

1a) F = 19.07, Reject H0: the different dosages result in significantly different levels of depression

1b) Qcrit for all comparisons = Q3, 12, .01 = 5.05. C vs. T1: Qobt = 6.36, reject Ho; C vs. T2: Qobt = 8.37, reject Ho; T1 vs. T2: Qobt = 2.02, do not reject Ho.

2a) Instruction: F = 52.57, Reject Ho; Imagery: F = 198.17, Reject Ho; Interaction: F = 16.85, Reject Ho.

2b) All post hoc comparisons are significant: reject Ho.

3) r = -.70, t = -2.401, Do not reject H0: the correlation is not significant (2-tailed).

4) Overall R2 = .723, F = 22.18; unstandardized b1 = .7046 (t = 4.02), unstandardized b2 = .5919 (t = 2.43); standardized beta1 = .602, standardized beta2 = .364.

5) χ2 = 4.112, do not reject H0: gender and age of contracting the disease are *independent*