KEY

Lab #11: Computational Review II

Part I: Download dataset **Perfume** from the website and run appropriate analyses to answer the following questions:

1. What's the average store-shopping hours (if appropriate)? $M = 2.21$

2. What's the average gender (if appropriate)? N/A

3. What's the standard deviation for internet shopping hours (if appropriate)? $\hat{s}_x = 1.541$

4. What's the median hours people shop online per week (if appropriate)? $Md = 3.00$

For the following, summarize the hypothesis testing statistic(s) and report the practical significance value(s) (if appropriate).

5. Test for a sig. difference between the average perfume rating and the typical value of 4.

$t(23) = .643$, n.s. (d not app.)

What's the difference expected in the formula?

$\hat{s}_{\bar{x}} = .324$

6. Test for a significant difference between hours spent shopping in the store vs. online.

$t(23) = 2.798, p \leq .05 \quad d = .5716$

What percent of the time would you see this size difference between the means just by chance?

$P = .01$ or 1% of the time

7. Test for a significant effect of gender on store shopping hours.

$t(22) = 2.217, p \leq .05 \quad d = .6402$

What's the observed difference in the formula?

$(-).958$

8. Test for a sig. effect of _perfume strength_ and _perfume type_ on rating.

P. STR $F(1,18) = 13.70 \quad \eta^2 = .62595$
P. TYPE $F(2,18) = 1.148 \quad n/a$
INTER $F(2,18) = 8.926 \quad \eta^2 = .3465$

What means would you use to report on the effect of perfume strength? 3.42 & 5.00

9. Test whether store and/or internet shopping hours correlate with pref. for luxury labels.

store hrs: $r(22) = .489, p \leq .05 \quad r^2 = .2391$
net hrs: $r(22) = .754, p \leq .05 \quad r^2 = .5685$

10. Of these two, what's the best predictor of luxury labels preference? Write the regression equation for this one.

net hrs $y' = 6.339x + 10.526$

Part II: 1. What percent of scores **fall above** a score of 22 on the ACT, assuming σ=5 and μ = 20?

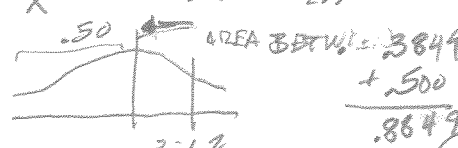$X = 22 \quad z = \frac{X-M}{\sigma_x} = \frac{22-20}{5} = \frac{2}{5} = 0.4$
$\mu = 20$
$\sigma = 5$

AREA BEY = .3446 or **34.46%**, $z = .4$

2. What percent of classes **do worse** than a class of 16 that averages 103 on a math proficiency exam (σ=10 and μ = 100)?

$\bar{X} = 103 \quad z = \frac{\bar{X}-\mu}{\sigma_{\bar{x}}} = \frac{103-100}{2.5} = \frac{3}{2.5} = 1.2$
$n = 16$
$\sigma = 10$
$\mu = 100$
$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{10}{\sqrt{16}} = \frac{10}{4} = 2.5$

AREA BTW = .3849 + .500 = .8649 **86.49%**, $z = 1.2$

3. Test the hypothesis that frogs who've done weight lifting (n=9) jump significantly higher (M=94; s=18) than normal frogs (μ = 90)? *Simply summarize the statistic.*

$n = 9$
$M = 94$
$s = 18$
$\mu = 90$

$t = \frac{\bar{X}-\mu}{s_{\bar{x}}} = \frac{94-90}{6} = \frac{4}{6} = .6666$

$t(8) = .6666$, n.s.

$s_{\bar{x}} = \frac{s}{\sqrt{n}} = \frac{18}{3} = 6 \quad t_{CRIT} = 2.3060$

	Drug	
Age	A	B
Young	0	5
	2	6
	1	7
Old	4	10
	5	11
	4	12

4. *Show below how you'd enter the data to the left into SPSS for a 2 way ANOVA. (DV = Performance)*

DRUG	AGE	PERF
1	1	0
1	1	2
1	1	1
1	2	4
1	2	5
1	2	4
2	1	5
2	1	6
2	1	7
2	2	10
2	2	11
2	2	12

5. Show below SPSS format for independent t-test data comparing the words recalled by boys (3,4,5,6) and girls (5,6,7,9).

GRP	WORDS	
1	3	
1	4	
1	5	
1	6	
2	5	
2	6	
2	7	
2	9	

You may not use all available spaces

6. Test the hypothesis that men are less likely to ask for directions.

Asked?	Gender	
	Women	Men
Yes	30 / 15	90 / 15 → 30
No	10 / 15	90 / 15 → 30
	30	30 → 60

$df = (R-1) \times (C-1)$
$= 1 \times 1 = 1$

$\chi^2 = \sum \frac{(OF-EF)^2}{EF} = \frac{(30-15)^2}{15} + \frac{(10-15)^2}{15} + \frac{(10-15)^2}{15} + \frac{(30-15)^2}{15}$

$\chi_c^2 = 3.841$

$= 1.6667 + 1.6667 + 1.6667 + 1.6667$
$= 6.6667$ REJECT H_0

7. Calculate SS for the following: 2, 2, 3

x	x^2
2	4
2	4
3	9

$\sum x = 7$ $\sum x^2 = 17$
$(\sum x)^2 = 49$

$SS = \sum x^2 - \frac{(\sum x)^2}{n}$
$= 17 - \frac{49}{3}$
$= 0.6\overline{6}$

8. Calculate $\hat{s}_x$ if SS = 90 and n = 11.

$\hat{s}_x = \sqrt{\frac{SS}{n-1}}$
$= \sqrt{\frac{90}{10}} = \sqrt{9} = 3$

Part III: Research suggests that when made to focus on materialistic success people become less happy and less satisfied. The following study prompted people to list three good (or bad) things about **greed** and then exposed people to images prompting **comparison** with families living low, medium or high luxury lifestyles. They then asked people to rate their own **life satisfaction**.

1. Summarize the A, B, & A*B effects.

$F_{(1,24)} = 55.19, p \leq .05$
$F_{(2,24)} = 1.104, n.s.$
$F_{(2,24)} = 12.56, p \leq .05$

Descriptive Statistics

Dependent Variable: life_satsif

Greed	Comparison	Mean	Std. Dev	N
Good	low luxury	3.60	1.673	5
	medium luxury	3.80	.837	5
	high luxury	2.20	.837	5
	Total	3.20	1.320	15
Bad	low luxury	5.00	.707	5
	medium luxury	5.40	1.140	5
	high luxury	7.80	.837	5
	Total	6.07	1.534	15
Total	low luxury	4.30	1.418	10
	medium luxury	4.60	1.265	10
	high luxury	5.00	3.055	10
	Total	4.63	2.025	30

Tests of Between-Subjects Effects

Dependent Variable: life_satsif

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	92.167[a]	5	18.433	16.50	.000
Intercept	644.033	1	644.03	576.7	.000
Greed	61.633	1	61.633	55.19	.000
Comparison	2.467	2	1.233	1.104	.348
Greed * Comparison	28.067	2	14.033	12.56	.000
Error	26.800	24	1.117		
Total	763.000	30			
Corrected Total	118.967	29			

a. R Squared = .775 (Adjusted R Squared = .728)

2. What means would you use to test for a main effect for greed?

3.20 & 6.07

3. What means ... for a main effect for luxury?

4.30, 4.60, 5.00

life_satsif

Est Marg Means vs Comparison (low luxury, medium luxury, high luxury) — Greed: Good, Bad
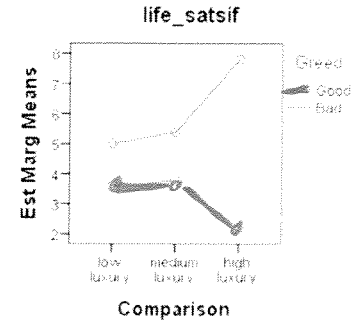
State the correct symbol and value for the following (e.g., F = 1.104)

4. What means would graph for the interaction? M = 3.6, 3.8, 2.2, 5, 5.4, 7.8

5. What's the obs. variance in the F formula for Greed? $MS_{bg} = 61.633$

6. What's the expected variance in the F formula for Greed? $MS_{wg} = 1.117$

7. What's the effect size for Comparison (if appropriate)? n/a

8. What's the effect size for the interaction (if appropriate)? $n^2 = .2359$

9. Complete the explanatory sentence for Greed (include a sentence on effect size if appropriate).

Participants primed to focus on greed as good scored sig lower in life satisfaction (M = 3.20) than those focused on greed as bad (M = 6.07) $F_{(1,24)} = 55.19, p \leq .05$. The effect of greed on satisf. was large, $n^2 = .5181$

10. Explain the outcome for the interaction factor (include a sentence on effect size if appropriate).

There was a sig interaction, $F_{(2,24)} = 12.56, p \leq .05$. Seeing greed as bad produces greater life satisfaction at both low & medium comparative luxury, but this diff is even greater at high comparative luxury.