9/3/2009

Two types of Data

1. variable - takes on more than one value. Variable varies

2 constant - takes on only one constant = does not change

- Point ~~estimation~~ Estimation - estimate the value of a partiacular value
- Examining Relationships - one variable is related or corolated with another. Example: if X is related to Y

can have two variables that dont covary

negative slope down

Causal relationship -
- Independent variable - the cause
- dependent variable - the effect
- Coveriation - change in response to one another
- temporal operation

Time ordering - cause of Y must come first. Ex: Gender and Deliquency, Age & Deliquency, Grades in School & Deliquency

Non spuriousness

- In order for X to cause Y we need to eliminate other possible of Y we need to make sure that we do not confuse other things that happen before Y.

Levels of Measurement

- Nominal - Gender
- Ordinal 15-20-21-25
- Interval = arbitrally 0 Age
- Ratio = rate frequency

Frequency - List of values of Data and the # of times it appears

Frequency Distribution - full array of values and # of times it occurs

Rate ~~F/population x standard unit~~

Rat = F/population x per 100,000 standard unit

Standard time size x by 12

Porportion divide Frequency in total # of cases

mutiply by 100 to get %

9/8/2009

~~difference between~~ difference between 2 intervals is the same interval ratio.

Porportion (f/n x 100)

percent change
ending value - starting value)

1980 1,241 per 100,000
1990 1,789 per 100,000
2000 1,137 per 100,000

(ending ~~year~~ value - starting ~~year~~ value)/starting ~~year~~ value
x 100

1,789 - 1,241 = 548 ÷ 1,241 = .442

100 = 44.2

~~1,137-1,790~~.

- = decrease

Number of Bad Arrest ~~from~~ in a sample of 30 police officers

person # 1	12	9
person #2	4	4
	6	10
	7	6
	13	8
	7	3
	10	4
	5	9
	8	4
	2	0
	7	5
	0	
	1	
	4	
person #15	6	

cf = cumulative frequency   start at top work your way down

% vector multiply by 100

0-4 range value (class interval)

Grouped frequency distribution

Class interval = mutually exclusive
fall into 1 and only one category

2. Make your class intervals exhaustive
3 Make your intervals all the same width.
4. Make sure that for your first class interval contains the smallest value + the last interval the highest.

Step 1 determine the number of class intervals you want

Step 2 subtract high 89 to Low 22 = 67.
3. Take the ratio of the range
67/8 = 8.375 = 8.
Class interval width of 8.
20 Lower interval width
~~20-28~~
20-27
28-35
36-

Nominal 3 ordinal Level data
Pie chart
Bar chart

19.5-27.5, 27.5-37.5 = continuous

Real class - not mutually exclusive

midpoint = exact middle of every class interval

$m_i = \frac{LL + UL}{2}$ $\frac{\text{Lower Limit} + \text{Upper Limit}}{2}$

$\frac{83.5 - 91.5}{2} = 87.5$

mode, median, mean
highest #

bimodal = two modes
trimodal = 3 modes

median interval/ratio Level
50% percentile
1. Rank order the data
Find the score(s) that is in the median with formula
$x(\text{median}) = \frac{(n+1)}{2}$ not give you the value of median but the position of the median

$X = L + \left[\frac{\frac{n+1}{2} - cf}{f} \right] w_i$

$43.5 + \left[\frac{36+1}{2} \right]$

$43.5 + \left(\frac{\frac{100+1}{2} - 36}{16} \right) 8$

$43.5 + (.91)^8 = 43.5 + 7.28 =$
50.78 marks

mean: $\bar{X} = \dfrac{\sum_{i=1}^{n} x_i}{N}$

Advantages= we use all our information

The distance from the [illegible]
deviation.

$$s = \sqrt{\frac{\Sigma(x-\bar{x}^2}{n-1}}$$

$$s = \frac{\Sigma(x-\bar{x}^2)}{n-1}$$

$x = \sqrt{x^2}$ = standard deviation [illegible]
[illegible] to the square [illegible]
the [illegible]
[illegible]
to the variance

Sum $x = \sqrt{\frac{10}{10-1}} = \sqrt{\frac{10}{9}} = 1.05$

1.11 variance

Take each score subtract the mean Sum
squared each deviation
the sum overall variation

subtract each score
square each [illegible]
then add
to get
the sum

$$x = \sqrt{\frac{\sum(x^2) - \frac{(\sum x)^2}{n}}{n-1}}$$

$$x^2 = \frac{\sum(x^2) - \frac{(\sum x)^2}{n}}{n-1}$$

$x_1^2 + x_2^2 + x_3^2$

$(x_1 + x_2 + x_3 \ldots)^2$

rect of x^2 squares

sum

$$\frac{170 - 40^2}{10} \div 4$$

$$\frac{170 - \left(\frac{40^2}{10}\right)}{10-1}$$

$s^2 = \frac{\sum \ \ \ \ \ \ }{n-1}$ NOT

- Subtract the mean ... square
- Square the deviation

Multiply the square ...

by the f...

Sum across all intervals ...

Square

Nominal Ordinal

Mode

Median

Mean

Variation Ratio

Interquartile Range

Variance

Standard deviation

Variation Ratio

$$VR = 1 - \frac{F_{mode}}{n}$$

	f
Small (50-1)	20
Medium (51-99)	50
Large (100-154) modal	90
Super Large (15...)	10
	N=170

$1 - \frac{90}{170}$ $1 - .53 = .47$

NJ	f
Small	50
Medium	20
Large	20
Supe	100 ← Mode
	170

$1 - \frac{100}{170}$

$1 - .59 = .41\%$

Bimodal

x	f	p	%	C%
10	6	.06	6%	6%
11	7	.07	7%	13%
12	9	.09	9%	22%
Q3 13	25	.25 ×	25%	47%
14	23	.23 ×	23%	70%
Q1 15	14	.14	14%	84%
16	6	.06	6%	90%
17	3	.03	3%	93%
18	7	.07	7%	100%
	n = 100	1	100	

CF
6
13
22
47
70
84
90
93

Q

$\frac{50+1}{2} = 25.5$

Number of Friends		x^2
1.	0	0
2.	2	4
3	3	9
4	4	16
5	1	1
6	1	1
7	3	9
	$n=7$	40

Mean $\frac{14}{7} = 2$

$$s = \sqrt{\frac{\Sigma - \frac{(\Sigma x)^2}{n}}{n-1}} \qquad \frac{40 - \frac{(14)^2}{7}}{6}$$

$$\sqrt{\frac{40 - \frac{196}{7}}{6}}$$

$$\sqrt{\frac{40-28}{6}}$$

$$\frac{12}{6} \quad s = \sqrt{2}$$

$s = 1.41$

$s^2 = 2$

$$s = \sqrt{\frac{\Sigma f m^2 - \frac{(\Sigma f m)^2}{n}}{n-1}}$$

$M_1 + \frac{LL + UL}{2}$

	f	M	M^2	fm^2
0-4	6	2	4	24
5-9	11	7	49	539
10-14	27	12	144	3888
15-19	4	17	289	1156
	48			5607

Fim

12
77
324
68

481 ÷ 48 = mean

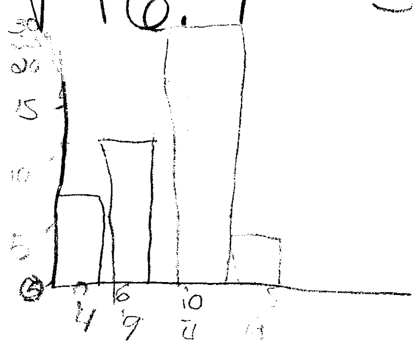
$$\frac{5607 - \frac{(481)^2}{48}}{48 - 1}$$

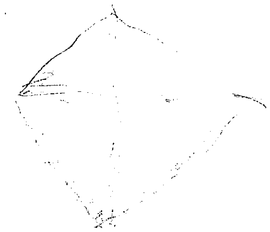
$$\frac{5607 - 4820}{47}$$

Independent = cause
dependent = effect

$\sqrt{16.7} = 4.09$

$S = \sqrt{16.7}$
$S = 4.09$
$S^2 = 16.7$





- descriptive research answer questions
- Explanatory [illegible] identify causes and effects of phenomena
- evaluation [illegible] effects of social programs and policy

Valid[illegible]

— [illegible]

[illegible]

Causal/internal validity [illegible]
correct [illegible]
and cause [illegible] causes
B.

Generalizability — it is used to [illegible]
place or event [illegible]
not [illegible]

- generalization occurs when you find [illegible]
are true [illegible]
population from which the sample
was drawn

Sampling error [illegible] difference
between [illegible] characteristics
Of a [illegible] and the
Characteristics [illegible]
population [illegible] which [illegible] was
taken

probability sampling - Allows
[illegible]
how likely it is that any
element Of a population
will be [illegible]

nonprobability sampling
methods [illegible] methods
that do not let us know the
likelihood [illegible]

Simple random sample -
generalize [illegible]
data [illegible] from the [illegible]
to a larger [illegible]

(Rate = $\frac{\text{Number in subset}}{\text{Total number}}$ x 1000)

Proportion = $\frac{\text{Number in subset of sample}}{\text{Total ... sample}}$ = $\frac{f}{n}$

Percent = $\frac{f}{n}$ x 100 = Proportion ... 100)

	F	Proportion	%
[illegible]	16	.0295	2.95
[illegible]	29	.072	7.2
[illegible]	48	.088	8.8
$[illegible]	[illegible]	.159	15.9
$[illegible]	10[illegible]	.188	18.8
[illegible]		.463	46.3

Mode [illegible]
then subtract that by 1

[illegible] ONOT
[illegible]

Range [illegible]

[illegible]

- S[illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
scores

801-573-[illegible]

- Square each of the [illegible] of the [illegible]
- Multiply each [illegible] by the [illegible] interval
- Sum [illegible] all [illegible] found
- Sum [illegible]
- [illegible]
- Divide [illegible]

Probability
- chance of an event occuring.

P(H in one flip of a coin) = .5

Suppose we flip a coin 10 times
10 times does it mean we are
going to get 5 heads and
5 tails? NO

expected value property of event
occuring x number of events

~~[illegible]~~

$.2 \times 20 = 4$

$P(A) = \frac{f}{n}$

~~[illegible]~~

Complement of an event
the compliment of event (A) = $1 - P(A)$

Odds of an event = Ratio of an event
$odds(A) = \frac{P(A)}{1 - P(A)}$

Mutually Exclusive - zero probability that they can occur together or at the same time.

Two events

The Bounding Rule
probability are bounded by 0 and 1.0. They can never be less than 0 or greater than 1.0.

Rule 2: The addition Rule
Restricted Addition rule
only if events are mutually exclusive

P(A and B) is the probability of events A & B occuring together - their joint probability.

non mutually exclusive

P(A or B) = P(A) + P(B) - P(A and B)

Rule 3 multiplication Rule
Restricted Multiplication
rule for independent Rule.

If two events are independent
events then the probabity

Independent if
$P(A) = P(A|B)$

$P(A)$ is the unconditional
probability of A
New Term: $P(A|B)$ Probability

Outcome of Trial	Retained Councel	Public Defender	total
Acquited	75	95	150
convicted	30	30	60
total	105	105	210

conditional = unconditional

	Retained Councel	Public Defender	Total
Acquit	55	95	150
Convict	50	10	60
Total	105	105	210

If $P(A) \neq P(A|B)$ is true then the events are not independent and Rule 3a does not apply. Rule 3b applies

Rule 3b: the general Multiplication Rule if two events

Probability distribution is a theoretical distribution. It is not a distribution. It is not a distribution

$P(0)$ Heads $= P(T\cdot T\cdot T\cdot T) = .5 \cdot .5 \cdot .5 \cdot .5 (.5)^4$
$.0625$

$P(1$ Head$) = P(H\cdot T\cdot T\cdot T) = .5\cdot .5 \cdot .5\, .5 (.5)^4$
$= .0625$

quiz thursday. calculate getting
2,3,4 heads

$P(R) \cdot q^R$

p^e — probability event occuring

q — probability of q not occuring

$p^e q^{n-r}$

$$\left(\frac{n}{r}\right) = \left(\frac{n!}{r!(n-r)!}\right)$$

$$P(r) = \binom{n}{r} p^r q^{n-r}$$

$$P(r) = \left(\frac{n!}{r!(n-r)!}\right) p^r q^{n-r}$$

H_0 = null hypothesis
assumption of innoscence

nondirectional = Alternative hypothesis
which means.

A hypothesis test begins with a null and alternative hypothesis, Lets go with a directional hypothesis.

$$P(r) = \left(\frac{n!}{n(n-r)} \right) p^r q^{n-r}$$

$p = .4$
$q = 1 - .4 = .6$
$r = 0, 1, 2 3, 4, 5$
$n = 5$

mean = $n \cdot p$ of binomical distrobution

5 steps
1. State the null and the alternative hypothesis
2. Select probability distribution
Binomical if 2 categories (Nominal distribution if contitous

3. Select Alpha Level of significance
Balance Type 1 (False positive)
and Type II (False negative) Errors
p = .05 (.10: .05; .001

4. Calculate the probability of
observing 8 or More of 10 Death

$P(r) = \left(\frac{n!}{r!(n-r)!}\right) p^r q^{n-r} = P(8) \left(\frac{10!}{8!(10-8)!}\right) .4^8 .6^{10-8}$

Critical region defines the class
of outcomes

Step 1 - State your hypothesis
.06
D > .06

~~Choose Probability distribution~~ Choose probability distribution

a=0.1 a=0.05 a=.001

~~Normal~~ Normal distribution
- Common distribution for continuous
data

$$\frac{1}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(x-\mu)^2}{(2\sigma^2)}\right)$$

μ=population mean

σ = population standard deviation

1. perfectly symmetric around Mean
2. Total area under the curve = 1
3. Distribution in unimodal

one curve convert all curves into a standard metric

$$Z = \frac{X - \bar{X}}{S}$$

Z = standard deviation units.

X = raw score

$\bar{X}$ mean score

S = standard deviation

Ex 250 prison Lengths with mean 100 and SD=10

Caculate Z score of 90 months =

(90-100)/10 = -1.00

mean 0

standard deviation 1

$$z = \frac{x - \bar{X}}{S}$$

population group we really want to know about
sample subset of the population

$$\frac{\sigma}{\sqrt{n}}$$

$\bar{x} = 148.2$ (per 100000)
$S = 38.7$

1ele

$$1 - \alpha C = \bar{X} \pm z\alpha\left(\frac{s}{\sqrt{n-1}}\right)$$

$$1 - \alpha CI = \bar{X} \pm 3\alpha\left(\frac{x}{\sqrt{n-1}}\right)$$

$$148.2 \pm 1.96\left(\frac{38.7}{\sqrt{80-1}}\right)$$

.01

99%

$$148.2 \pm 2.58\left(\frac{38.7}{\sqrt{804}}\right)$$

$148.2 + 2.58(4.35)$

Now suppose: we take a ~~small~~

two tail test

$$1-\alpha\,(1 = p + z_{\alpha}\sqrt{\frac{p(1-p)}{n}}$$

$\frac{89}{125}$ or 71%

5 [illegible]

[illegible]

Chapter 8

1. Formally state your null (H0) and alternative (H1) hypothesis

2. Test an appropriate test statistic and the sampling distribution of that test statistic the probability distribution

3 Select an alpha level your level of significance

Step#1

HO: Mean IQ of delinquent is 100 $u=100$

H1: Mean IQ of delinquent is less than 100

$$z = \frac{x - \bar{X}}{S} \qquad z = \frac{X - u}{\sigma/\sqrt{n}} ; \quad z = \frac{X - u}{S/\sqrt{n}}$$

rare event if 1.65 or less

$t =$ $t = \frac{\bar{X} - u}{s / \sqrt{n}}$

.01

Ho: Mar 35FF of space
H1, < 35F of space

one tailed test n-1 or 29 df.

$t = 2.462$

Be

$\frac{23.9 - 33}{11.7 / \sqrt{30}}$

> two tailed
> < = one tailed

when no standard deviation is given you calculate a porption.

Race of victim	F
nonwhite	120
white	80

Sentencing Decision	F
life	160
death	40

Non-white	110	10	120
White	50	30	80

The independent variable may appear as either the row or the column variable.

Relationship between two variables expressed as correlation

Relative Risk. Calculate the relative risk use the marginal frequency either row or column for the independent variable as your base number to calculate the proportion or a conditional probability.

$\frac{40}{200} = .20$ = Risk

Relative Risk killed and white $\frac{10}{120} = .08$

Row total = denominator

CHi-square test for independence
Assume the two variables are independent construct a table on the basis of that assumption Then compare the table of independence with the one we actually observed.

H0 = two variables are independent ($\chi^2 = 0$)
H1 = two variable are not independent ($\chi^2 > 0$)

Probability A & B occurring (A·B)

p (a and b) = p(a) x p(b) Multiplication Rule

P(nonwhitevictim) $\frac{120}{200}$ = .60
(lifesentence ($\frac{160}{200}$ = .80

.60 .80 = .48

P(whitevictim)

$X^2 = \Sigma = \Sigma \frac{(Fo-Fe)^2}{Fe}$

Fo = observed frequency
Fe = expected frequency

1. State the null and alternative hypothesis

find alpha level degree of freedom

$X^2 = \Sigma$.

(RM x CM) / N

10/20/09

Hypothesis tests are sensitive to sample size

Nominal Level data
Lambda
Ranges from 0 no relationship to 1 perfect relationship
closer to 1 stronger relationship

$V = \sqrt{\frac{X^2}{n(k-1)}}$ where k = number of rows or columns whichever [illegible] [illegible] [illegible]

Ordinal
Gamma
Ranges in value -1 to +1 [illegible] 0 [illegible] relationship
0 - .29 weak relationship
.30 - .59 moderate relationship
.60 [illegible] strong relationship

$\gamma = \frac{(\Sigma f_a \times f_d)[illegible]}{(\Sigma f_a \times f_d)[illegible]}$

A	B
C	D

V in a 2x2 table [illegible] referred to as [illegible] a phi

neg relationship increasing independent variable decreases proportion [illegible]
of dependent [illegible]

piesquared = Crosstab [illegible]

Identifying independent [illegible]
variable [illegible]

	Not Attend	Attend	Row Total
Bootcamp	48	45	88
Regular	[illegible]	50	87
Total	80	95	175

$\frac{45}{88} = .51$

$\frac{50}{87} = .57$

$$\begin{array}{r} 88 \\ +87 \\ \hline 175 \end{array}$$

Conduct A formal hypothesis
$Z^2 = 0$ = not related
$Z^2 > 0$ = related

a chi square [illegible]

$\alpha = .05$ $\quad .05/2$

$n = 100$ $\quad .025$

$.05 - .025 .475$

$95\% = 1.96$

$$5 \pm 1.96 \frac{1.7}{\sqrt{100-1}}$$

$$\frac{1.7}{99} = 9.95 = .171$$

$5 \pm 1.96(.171) = .335$

$5 + .335$ $\quad 5 - .335$

5.335 $\quad 4.665$

3 $\frac{84}{120} = .7$ $(1-.7) = .3$

$p = .7$

$q = .3$

10/29/09

HYpothesistest withTwopopulation
mean or porptions
Independent Nominal or ordinal
andonlytwo categories
Dependent - Continous

Twosamples twogroups
Caculate samplesatistic foreach
group.

Independent sample test means
Dedendent Sample test formeans

$X_1 - X_2$

$u\ \bar{X}_1 - \bar{X}_2$

If the onepopulationstory is
true whatweneedtoknow what is the probability
that I would find a sample
size aslargeasIdid?

$P(\bar{X}_{LJ} - \bar{X} = 11\text{days} \mid M_{LJ} = M_{NLJ}$

$Z = \frac{X - \bar{X}}{S}$ $Z = (x_1 - x_2) - (u_1 - u_2)$

$$z = \frac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)}{(\sigma_{\bar{x}_1} - \bar{x}_2)}$$

Two changes : $t = \frac{(\bar{X}_1 - \bar{x}_2)}{(\sigma_{\bar{x}_1} - \bar{x}_2)}$

Two
Indepent

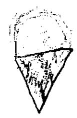
- Two population means ($\mu_1 = \mu_2$) which is the same thing as saying that $(\mu_1 - \mu_2) = 0$

Two diffrent kinds of T-test here depending upon whether or not you can assume that the population standard deviation are equal

Model 1 $\sigma_1 = \sigma_2$ Pooled Variance t-test

Model 2 $\sigma \neq$ Seperate Variance t-test

$$t = \frac{(\bar{X}_1 - \bar{X}_2)}{\sqrt{\frac{(n_1-1)s^2 + (n_2-1)s_2^2}{n_1 + n_2 - 2}} \sqrt{\frac{n_1 + n^2}{n_1 n_2}}}$$



$n_1 + n_2 - 2$

[illegible] two [illegible] between two [illegible] $(p_1 - p_2)$

What role does [illegible] impact [illegible] play in [illegible] faulty [illegible]?

Two [illegible]

$$\frac{\hat{p}_1 - \hat{p}_2}{\sigma_{\hat{p}_1 - \hat{p}_2}}$$ Estimate $\hat{p}_1 - \hat{p}_2$: sample [illegible]

Experiment $n_1 = 75$ Control

$p_1 = .08$ $n_2 =$ [illegible]

$p_2 =$ [illegible]

$$\hat{p} = \frac{75(.08) + 75(\ldots)}{75 + 75}$$

$75 \overline{)150}$

Mixed sample $\hat{p}$

[illegible]

	VIE	
Life	24	38
Death	51	[illegible]
	75	[illegible]

p = the [illegible] proportion [illegible]

p q = the [illegible] proportion for [illegible]

$q = 1 - p$

4. Independent Yes
population known = Yes
Z test

Step 1

$H_0 = P_1 \quad P_2$ Fine Am[illegible]

$H_1 = P_{fine} \neq P_{Am}$

Step 2 = Z test

α = .05 zcv = ± 1.96

Step 4

$$\frac{p_1 - p_2}{\sqrt{pq}\sqrt{\frac{n_1+n_2}{n_1 n_2}}}$$

Find p

$$p = \frac{3(.33) + 3(.38)}{6}$$

$$\frac{.99 + 1.14}{6} = .35 \quad p = .35$$

$$\frac{p_1 - p_2}{\sqrt{pq}\sqrt{\frac{n_1+n_2}{n_1 n_2}}} \qquad \frac{.33 - .38}{\sqrt{(.35)(.65)}\sqrt{\frac{150+110}{(150)(110)}}}$$

$$\frac{-.05}{.0477} = -1.05$$

Since -1.05 is not more than 1.96
greater than 1.96 reject the
reject the null

5. Independent? Yes:
Population known = No
Equal No Seperate variance Test to
Step 1
$H_0 = \mu_1 = \mu_2$
$H_1\ \mu_{Male} < \mu_{Female}$
Step 2
Seperate variance T test
Step 3
$n-1=$ .05

11/12/04

116 Analysis and variance
independent variable three or
more levels and continuous dependent
level

Test for all different samples

ANOVA- you have an independent
variable with more than two
levels and a continuous
dependent variable

ANOVA breaks down when k increases

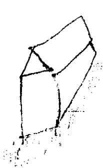
What is variance

$$s^2 = \frac{\sum (x_i - \bar{x})^2}{n - 1}$$

A variance is awesome since you only
need the mean

$\bar{X}_G$ = Add all divide by total
number [illegible]

[illegible] ~~sub~~ with $\bar{X}_G$ [illegible]
square it



F-test Involves an F-test
we are [illegible] F-test is

F = Var[illegible] groups / Var[illegible] groups

F = variance across/between groups / variance [illegible] groups

Step 4

Source	SS	df	variance	F
Between				
Within				

Step 2

This is a ANOVA F-test
[illegible]

Step 3

K-1	within	total
	n-K	n-1
# of groups	total [illegible]	

Tukey HSD Test

$$CD = q\sqrt{\frac{\text{variance within groups}}{n_K}}$$

SS total = SS Between + SS within
SS total = Treatment effect + noise

Radio of SS Between / SS total

$H_0\ M_1 = M_2 = M_3$
$H_1\ M_1 \neq M_2$

variance $(x - \bar{x})^2$

7 p. 844

$x_1 = 8.3$ $x_2 = 3.3$ $x_3 = 1.6$ $X_G = 4.4$

Anova = F test

Independent variable categorical 3 levels
Anova dependent continuous

T-test Independent is only Two categories
dependent continuous

Chi Square = Independent and dependent is categorical

Z test = normal

Only Anova

Step 1
$H_0 = M_1 = M_2 = M_3$
$H_1 = M_1 \neq M_2 = 3$

Step 2 Anova F test

High | Med | Low

$(4-4.4)$

$(3-4.4)^2 = 1.96$
$(1-4.4)^2$ 11.56
$(2-4.4)^2$ 5.76
$(0-4.4)^2$ 19.36
$(2-4.4)^2$ 5.76
$(4-4.4)^2$ .16
$(1-4.4)^2$ 11.56
$(0-4.4)^2$ 19.36
$(1-4.4)^2$ 11.56

87.04

337.4

Step 3 $\alpha = .05$

n-K group
# of observations $30-3=27$ within degrees of free
observations, group

$3-1=2$ Between degrees of freedom
$30-1=29$ (total degrees of freedom)

F 3.35 reject if F is greater than or equal to 3.35

Step 4

1. SS between $(8.3-4.4)^2 = 15.21(10)$
$(3.3-4.4)^2 = 1.21(10)$
$(1.6-4.4)^2 = 7.84(10)$

SSB 242.6

SST = 337.4
SSB = 242.6
SSW = 94.8

divide SS÷df = variance

Source	SS	df	Variance
between	242.6	2	121.3
within	94.8	27	3.5

F = 34.6

Step 5 reject
Level of Stress [illegible]

$CD = q\sqrt{}$

$Cd\ 3.49\sqrt{\frac{3.50 \text{ within variance}}{10 \text{ (\# of ppl in each group)}}}$

CD = 2.06

$$\begin{array}{r} \text{High } 8.3 \\ \text{Med } 3.3 \\ \hline 5.0 \end{array} \qquad \begin{array}{r} 8.3 \text{ High} \\ -1.6 \text{ Low} \\ \hline 6.7 \end{array} \qquad \begin{array}{r} 3.3 \text{ Med} \\ 1.6 \text{ Low} \\ \hline 1.7 \end{array}$$

$$\eta^2 \; \frac{SSB}{SST} = \frac{642.6}{3317.4} = .19$$

Fail to reject you done

How to recognize different kinds of problems

PooledT-test modelone

$n-1$ total

$N-K$

$K-1$

[illegible]

[illegible] product-moment correlation [illegible] (Correlation [illegible])

$$r = \frac{\sum (x-\bar{X})(y-\bar{Y})}{\sqrt{\sum (x-\bar{X})^2 [illegible]}}$$

-1.0 (perfect negative [illegible])
0 (no relationship)
+1.0 (perfect positive relationship)

$$r = \frac{n\sum x [illegible]}{\sqrt{n\sum [illegible]}}$$

take r and square [illegible] and multiply by 100

r only for linear relationship

[illegible]

X is the [illegible]

Test for the significance of ~~R~~ R and B

$t = R\sqrt{\frac{n-2}{1-r^2}}$

TO DO LIST
Finish reading Book
for quiz
Practice
STAT (work hard on it)

regression equation

$\hat{y}$ = y intercept + slope(x) + ε ← error in predicting y from x

$\hat{y} = a + bx_i$

ε

# of months in prison

Bivariate regression
$y = a + bx$

$t = r\sqrt{\frac{n-2}{1-r^2}}$

3.974 (difference in means)
4.061

0 and 1 dummy variable