

Welcome back, fam...

#	Date	Read (5th)	Due	Area	Lecture Topic	Lab #	Lab Assignment	T Lab	R Lab
1	Tue Aug 26			Orientation	Welcome & Orientation	-		-	-
2	Thu Aug 28	1.1 to 1.4			Basic Terms	-		-	-
3	Tue Sep 2	2.1 & 2.5			Measurement Issues	1	Leads / Age 3x	1	-
4	Thu Sep 4	3.1			Data Reduction	2	Heaven & Hell	1, 2	-
5	Tue Sep 9			HW1 Description	Display & Analysis (Shapes & SPSS)	3	Total Miles	2, 3	-
6	Thu Sep 11	3.2 & 3.3			Central Tendency	4	CI	-	-
7	Tue Sep 16	3.3 & 3.4			Dispersion	5	Dispersion	4, 5	-
8	Thu Sep 18	3.7			Indices & Data Cleaning	6	Music Index	-	-
9	Tue Sep 23	4.2			Probability & Z Scores	7	Standardizing Scores	6, 7	-
10	Thu Sep 25	4.3		HW2	Z & Pz	8	Table A	-	-
11	Tue Sep 30	3.6 & 5.1			Parameters & PI Estimation	9	Distances	8, 9	-
12	Thu Oct 2	2.2 to 2.4 & 4.3			Sampling (Issues, Methods, Effects)	10	Sampling	-	-
13	Tue Oct 7	4.4 to 4.6			The Central Limit Theorem	11 EC	CI (World EC)	10, 11*	-
14	Thu Oct 9	5.3			Confidence Intervals	12	CI for Intervals	-	-
15	Tue Oct 14			HW3	CI for Proportions	13	CI for Proportions	12, 13	-
16	Thu Oct 16	6.1 & 6.4			HypoTesting & Zs	14	Various Hypotheses	-	-
17	Tue Oct 21				HypoTesting for Large ns	15	Two Tests	14, 15	-
18	Thu Oct 23	6.3 & 6.8		HW4	The "t" test, for small ns	16	CI & Test Ages	-	-
19	Tue Oct 28	6.4			Sample Size Estimation	17	Estimating n needed	16, 17	-
20	Thu Oct 30	7.1, 7.3, & 10.1			Differences in Means	18	Comparing Means	-	-
21	Tue Nov 4	7.2		HW5	Differences in Proportions	19	Comparing Proportions	18, 19	-
22	Thu Nov 6	12.1			Analysis of Variance	20, 21 EC	ANOVA (c. MODEL 3 EC)	19, 20, 21*	-
23	Tue Nov 11				(Values & Stats)	-		-	-
24	Thu Nov 13	9.4 & 9.5			Scatterplots & Correlation	22	Grade Correlations	-	-
25	Tue Nov 18	9.1 to 9.3		HW6	Regression	23	Regression Lab	20, 21*, 22, 23	-
26	Thu Nov 20	10.2 & 11.1			Multiple Regression	24 EC	Multiple Reg (EC)	-	-
27	Tue Nov 25	8.1		HW7 Association	Crosstabulations	25	TBA (only)	24*, 25	-
28	Thu Dec 2	8.2 & p. 233			Dependence	26, 27 EC	TBA (SCU) & (27 EC)	26, 27*	-
29	Tue Dec 4	pp. 238 to 243		HW8	Association	28 EC	Measures of Assoc (EC)	25, 26, 27*, 28	-
30	Thu Dec 8				(no lecture - work session only)	-		-	-
31	Thu Dec 11				(no lecture - work session only)	-		-	-

Scatterplots in SPSS

- Menu changes a bit each version
- Versions c11-c14?
 - Graphs > Scatter
 - Click "define"
 - Y is dependent, X is independent
- Current
 - Graphs > Legacy Dialogs
 - Scatter/Dot > Simple Scatter
 - Define > Y (DV) & X (IV)
 - NO other changes

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Correlations: Plots, Lines, & Slopes

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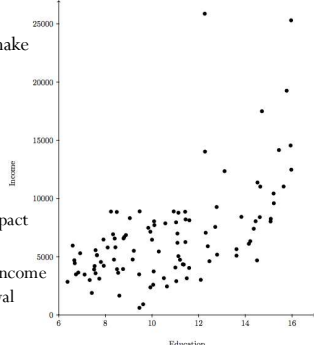
Three ways to plot bivariate data

- Scatterplot**
 - For each value of X, every value of Y
- Means plot**
 - For each value of X, the average value of Y
- Regression line**
 - For each value of X, the predicted value of Y
 - A line as close as possible to *all* of the points

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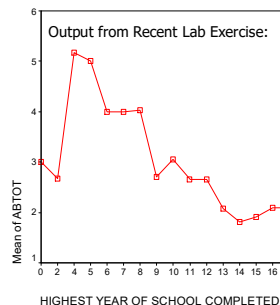
Intro - Scatterplots

- Why are you in college?
- What if told you you'd make less w/ more education?
- Does it go up forever?
 - No, stops @ some pt
- Some outliers
 - Drop out & make lots, but that's atypical
 - Larger sample > less impact
- Other Ivs
 - What else involved w/ income
 - Sex as IV? But not interval



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Remember the Means Plot?

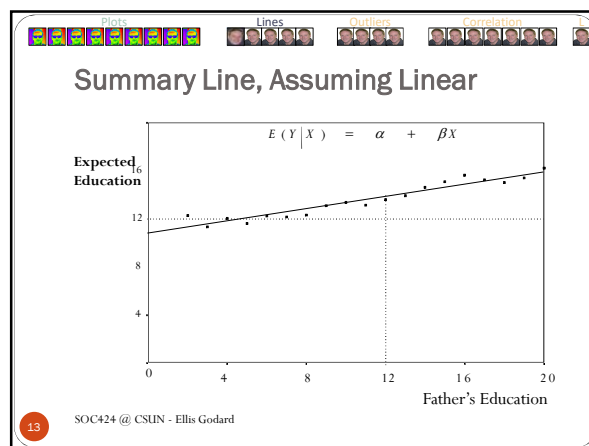
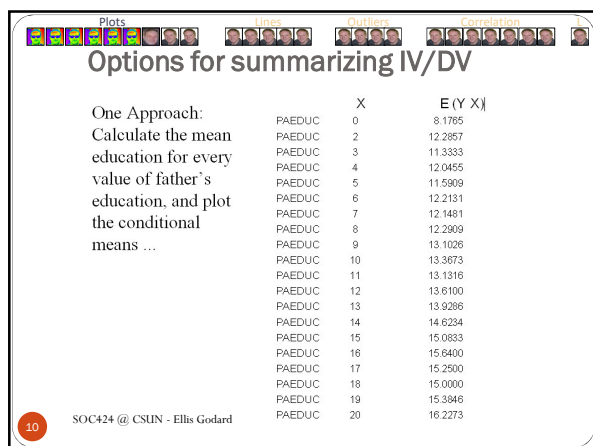
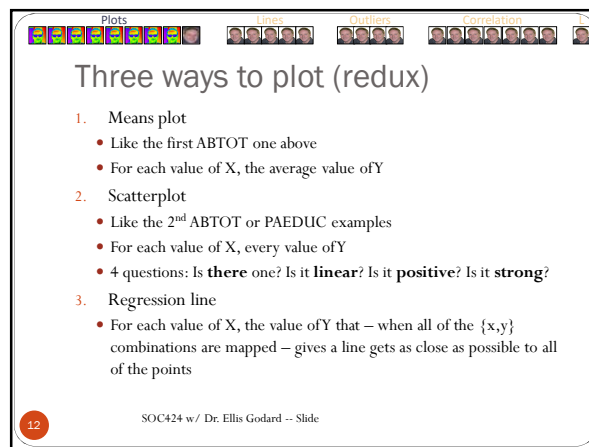
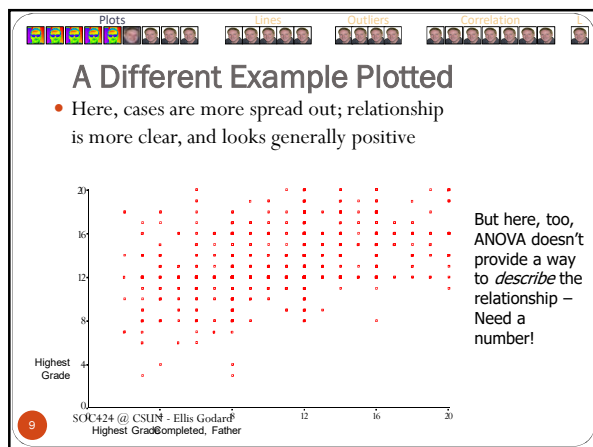
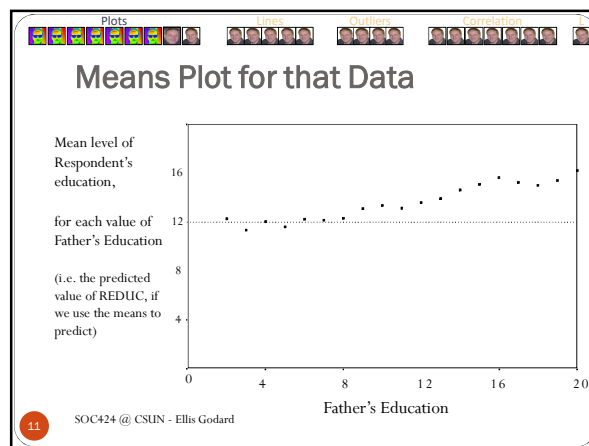
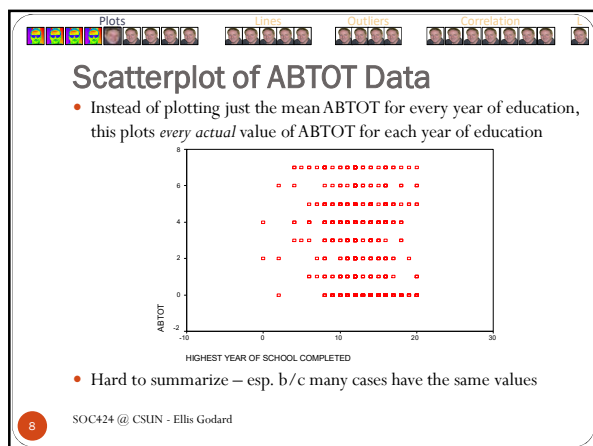


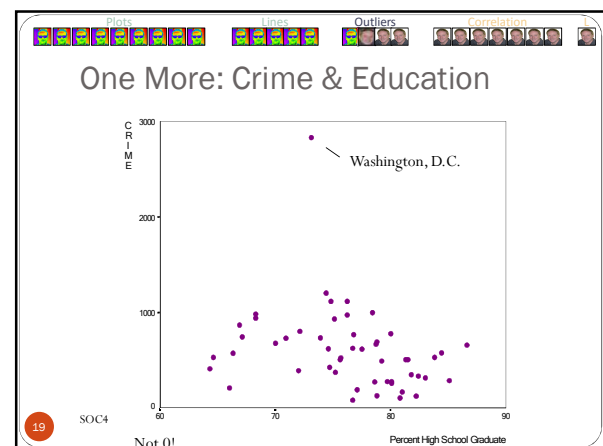
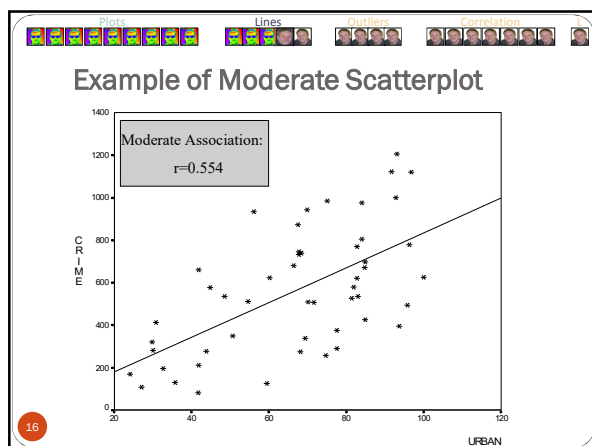
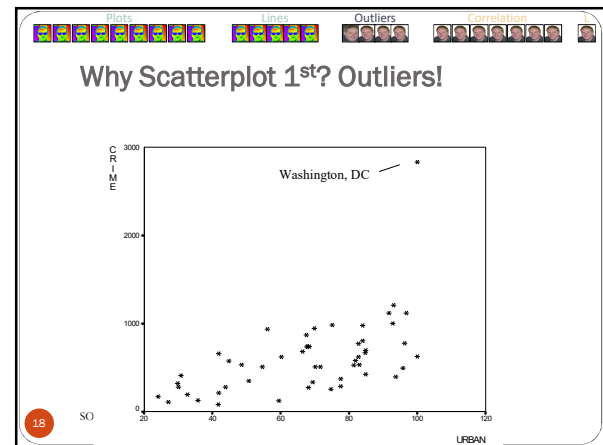
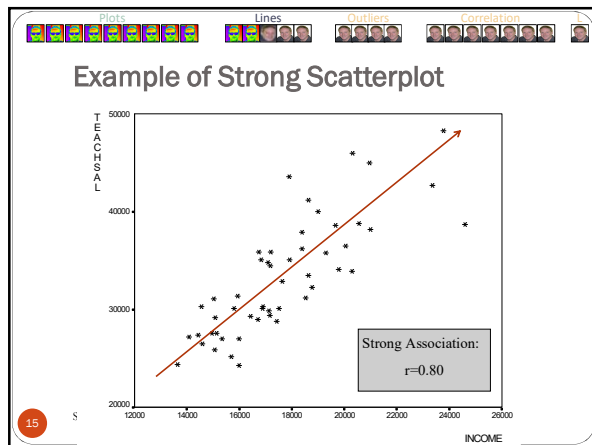
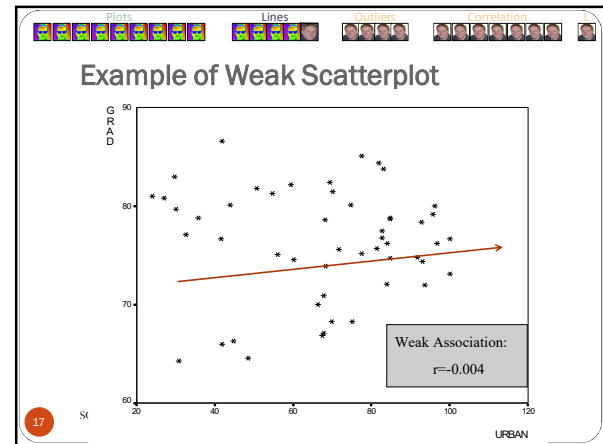
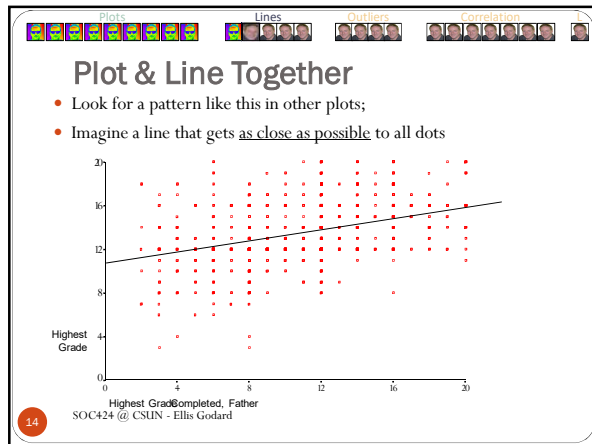
- ANOVA only assesses whether there is a relationship; it doesn't describe a relationship (is there one? is it linear? negative? strong?)

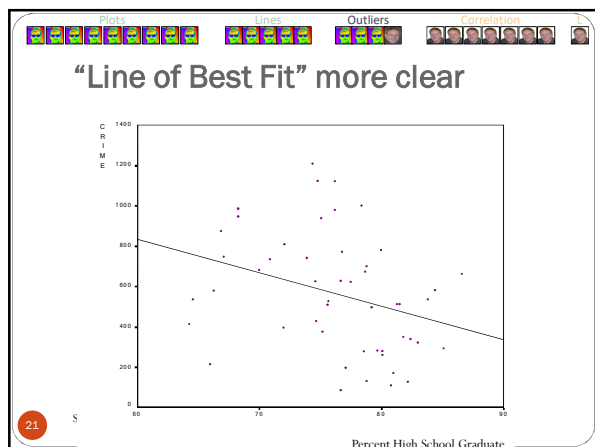
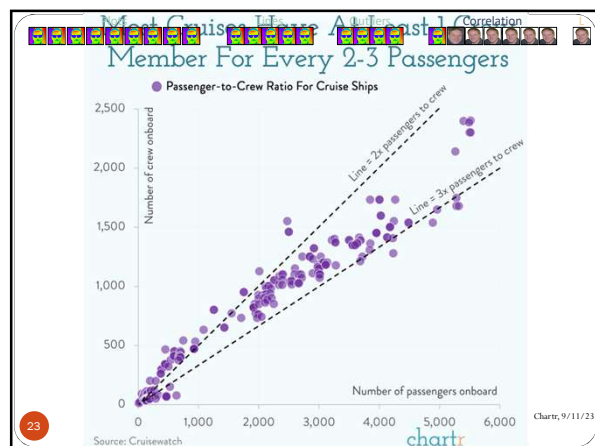
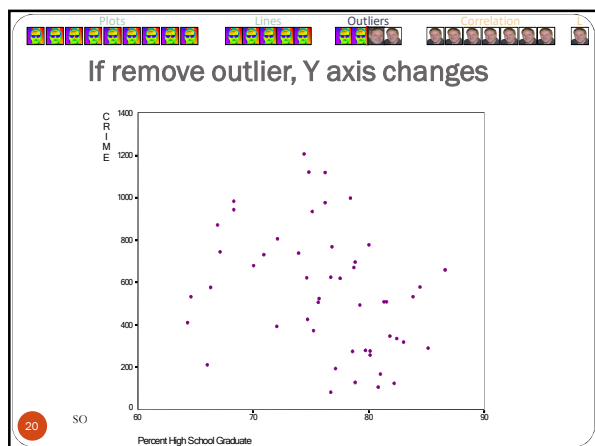
BUT

- The general trend here is clear, because we're focusing on the mean value of the DV for each value of the IV

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Plots Lines Outliers Correlation

Correlation Matrices in SPSS

- **Analyze – Correlate – Bivariate**
 - (in PSP: Analyze – Bivariate Correlations; click "flag sig correlations")
 - Options – Means & Standard deviations
 - Pick all variables you need (tho output is bivariate, about pairs)
- **Matrix gives three values for each pairing:**
 - **n** - number of cases with values on both variables
 - **Correlation coefficient**
 - Higher = stronger
 - Note asterisked notes - Easily ID which are statistically significant
 - **P-value**
 - probability of Type I error in inferring correlation coefficient to population, i.e. test where $r_0=0$)
 - Same for beta and r
 - Ps in SPSS are for two-tailed (except chi-square or F)

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Plots Lines Outliers Correlation

Correlation: Idea & Calculation

- Used standard deviations (averaging the sum of squared deviations from the means)

Independent Variable

$$\hat{\sigma}_x = s_x = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n - 1}}$$

Dependent Variable

$$\hat{\sigma}_y = s_y = \sqrt{\frac{\sum (Y_i - \bar{Y})^2}{n - 1}}$$

Correlation Coefficient (r)

$$r = \left(\frac{s_x}{s_y} \right) b$$

Multiply b and 1 by s_x

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Plots Lines Outliers Correlation

Simplified output (just the r's)

	SATFAM	SATFRND	SATFIN	SATJOB
SATFAM	1.000			
SATFRND	.3662	1.000		
SATFIN	.1464	.0884	1.000	
SATJOB	.0403	.1460	.2467	1.000

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R = very useful for comparisons

- Does not depend upon units in which the original variable is measured
- Always falls between 1 and -1
- Sign of r is always the same as the sign of b (though if look at multiple R , it's always positive)
- Also measures strength – if close to 1 (or -1), relationship is strong; if close to 0, it's weak

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Correlation Lab

- GradesCorr.sav holds data from a previous semester, including each student's final grade, grade on HW1, grade on the first exam, and number of labs missed
- Using SPSS, examine correlations among these variables
- Use output to consider potential predictors of final grades
- Submit answers to these questions (don't need to print)
 - Which variable is most strongly correlated with the final grade?
 - Which variables are positively correlated, and which are negatively correlated?
 - Not just w / final grade – out of all 6.
 - Which, if any, of these correlations are significant to 0.01?
 - Not just w / final grade – out of all 6.

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Colleges.sav example

- Analyze > Correlate > Bivariate
- Pick variables and Click OK...

	In-state tuition	Out-of-state tuition	Average Math SAT score	Average Verbal SAT score	Average ACT score
In-state tuition	1	.928**	.443**	.535**	.514**
Out-of-state tuition	.928**	1	.568**	.626**	.605**
Average Math SAT score	.443**	.568**	1	.917**	.895**
Average Verbal SAT score	.535**	.626**	.917**	1	.880**
Average ACT score	.514**	.605**	.895**	.880**	1

** Correlation is significant at the 0.01 level (2-tailed).

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