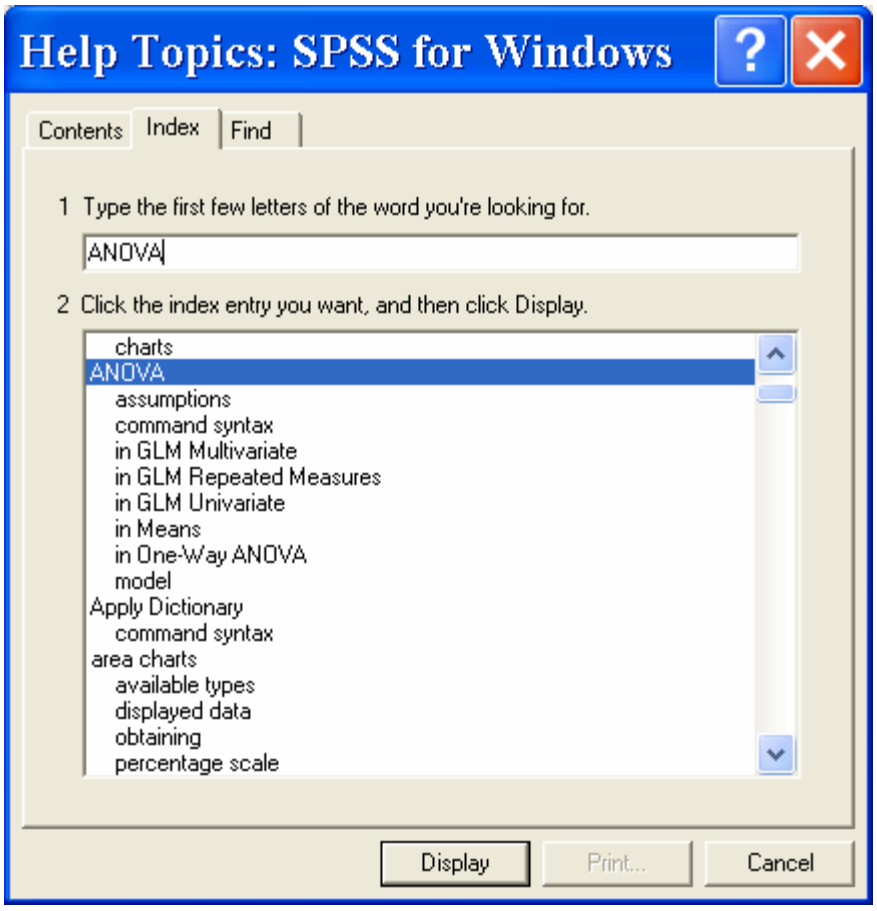
Answer Key for Exercises

Exercises-Chapter 1

1.1 A variety of topics appear under ANOVA. A summary is below. You should look at some of the topics in more detail.



1.2 I found 2 sets of information: one for categorical or nominal data and another for continuous data. Clicking on either one gave me suggestions about appropriate types of analyses to run given these types of data.

1.3 This will change the view in the Data Editor. When it is checked each piece of data is in a cell (surrounded by lines), when it is not checked, the cells are not divided by lines.

1.4 This is a matter of personal preference. There is no right answer.

1.5 This is a matter of personal preference. There is no right answer.

Exercises-Chapter 2

2.1 A sample of labels and values follows.

Name	Type	Width	Decimals	Label	Values
trial	Numeric	5	0		None
rxtime	Numeric	6	0	reaction times in 100th of a second	None
nstim	Numeric	5	0	number of digits	None
yesno	Numeric	5	0	was test digit included in comparison set	{1, yes}...

2.2 A sample of the correct data file follows.

	intrus
1	0
2	1
3	1
4	2
5	2
6	3
7	4
8	4
9	4
10	5
11	5
12	5
13	6

2.3 Answers will vary depending on how you created your own data file. Remember to compare your file to *Exercise2.2.sav* on the CD.

2.4 To perform this exercise accurately, you would have used the merge/add cases option. The only way you would know this is by opening the 2 original files and looking at them. You can see both include the same variables, but include the data from different people. The merged file will include 90 cases.

2.5 To do this effectively, you would need to have noticed that the variable names were included at the top of the file and that commas delimited the data. A sample of the correct data file follows.

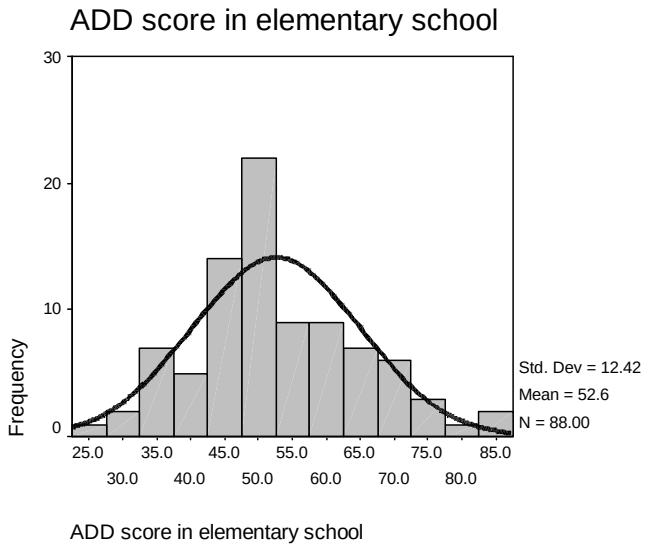
	id	gender	q1	q2	q3
1	1.0	2	3	4	5
2	2.0	1	1	2	3
3	3.0	1	2	3	4
4	4.0	2	3	4	5
5	5.0	1	4	5	5
6	6.0	2	1	1	1
7	7.0	1	1	2	2
8	8.0	2	3	3	4
9	9.0	2	5	4	3
10	10.0	1	3	4	5
11	11.0	1	3	4	5

2.6 All of the original variable names were longer than 8 characters, so I renamed them before reading them into EXCEL so they wouldn't end up with generic or truncated names. A sample data file follows.

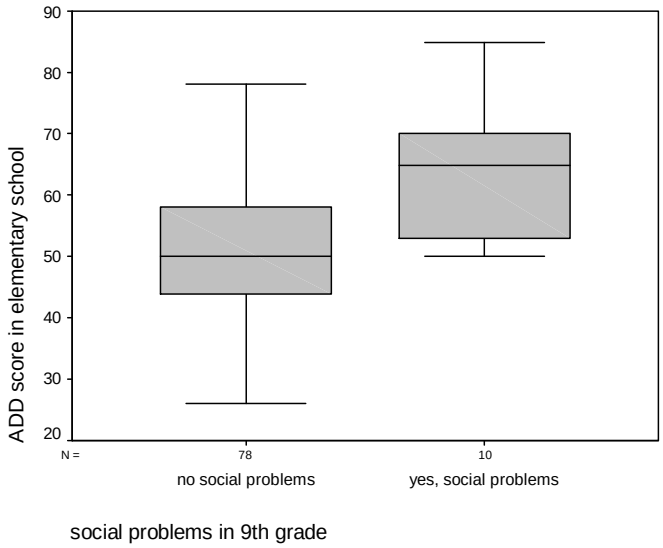
	name	group	tgrade1	tgrade2
1	Jennifer	1	90	88
2	Michelle	2	65	67
3	Moriah	1	78	85
4	Matthew	1	85	78
5	Jacob	2	87	84
6	John	2	67	65
7	Melissa	1	75	77
8	Casey	2	78	90
9	Corinne	1	89	877
10	Keith	1	92	94
11	Amanda	2	90	90

Exercises-Chapter 3

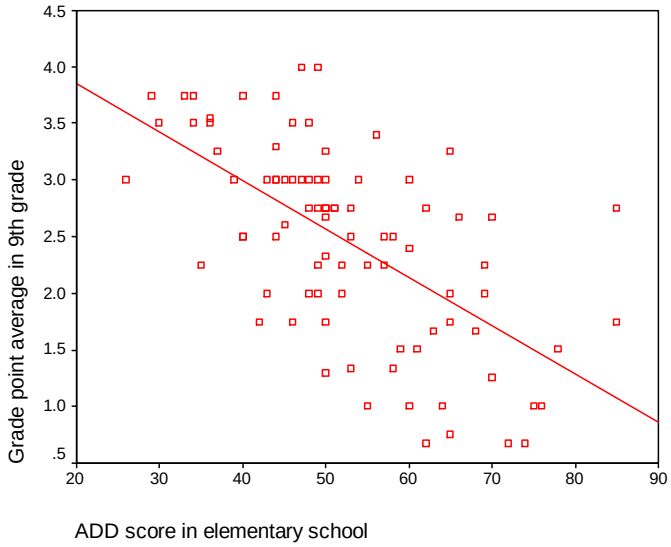
3.1 A histogram for ADDSC follows.



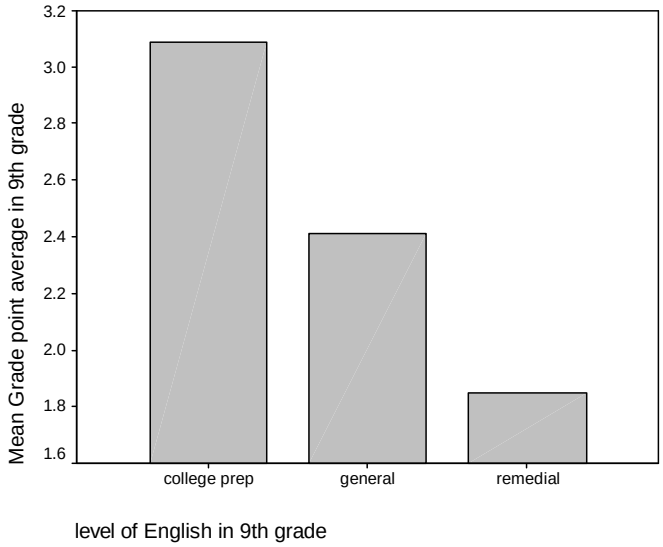
3.2 The box plots follow. It appears that students with social problems have more ADD symptoms than students without social problems. The distribution appears more normally distributed for students with no social problems. The distribution for students with social problems appears positively skewed. Neither group has outliers.



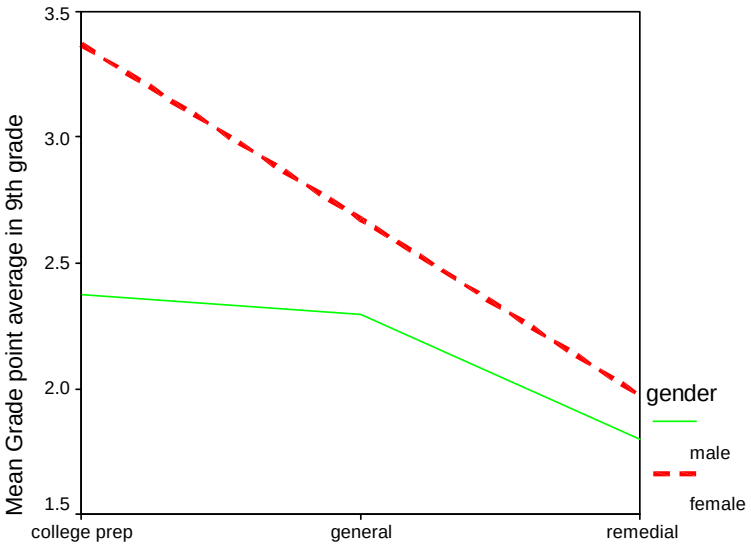
3.3 A sample scatter plot follows. There appears to be a negative association between GPA and ADD symptoms.

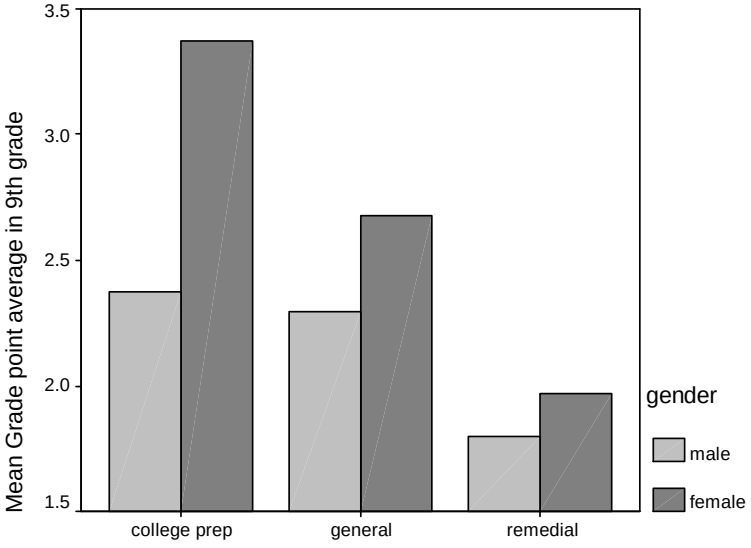


3.4 A sample bar chart follows. It looks as if GPA differs between the 3 groups such that students in the college prep course have higher GPAs than students in general or remedial English, and students in general English have higher GPAs than students in remedial English. [Of course, we would need to compute some inferential statistics to see if these differences are statistically significant.]



3.5 The 2 graphs follow. It looks like there is a main effect of type of English class as described above. It also looks like there is a main effect of gender such that females have higher GPAs than males. I would guess there is an interaction effect such that the gender difference in GPA is greatest among students in college prep English. I like the line graph better because I think it is easier to visualize interaction effects with a line graph than a bar graph.


3.5
3.0
2.5
2.0
1.5
Mean Grade point average in 9th grade
college prep
general
remedial
level of English in 9th grade
gender
male
female


3.5
3.0
2.5
2.0
1.5
Mean Grade point average in 9th grade
college prep
general
remedial
level of English in 9th grade
gender
male
female

Exercises-Chapter 4

4.1 The output follows. I used Analyze/Descriptive Statistics/Frequencies to calculate these descriptives because it includes all of the options including the histogram.

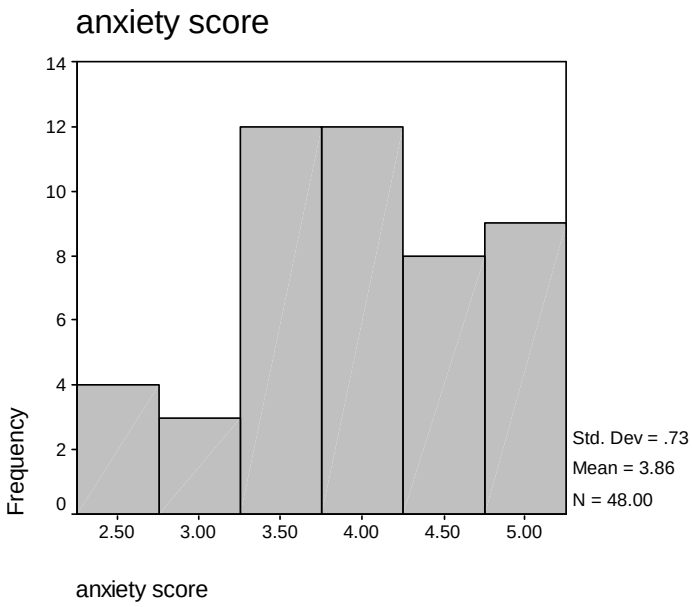
Frequencies

Statistics

		self esteem	anxiety score	coping score	health score
N	Valid	50	48	50	50
	Missing	0	2	0	0
Mean		3.4933	3.8558	2.0856	3.0249
Median		3.6667	4.0000	1.9688	3.0000
Mode		4.00	3.50[a]	1.76[a]	3.00
Std. Deviation		.5139	.7337	.5570	.6146
Variance		.2641	.5383	.3102	.3777
Range		2.17	2.75	2.53	2.72

a. Multiple modes exist. The smallest value is shown

Histogram


anxiety score
14
12
10
8
6
4
2
0
Frequency
2.50
3.00
3.50
4.00
4.50
5.00
anxiety score
Std. Dev = .73
Mean = 3.86
N = 48.00

4.2 I calculated these frequencies using Analyze/Descriptive Statistics/Crosstabs. The results follow.

gender * social problems in 9th grade Crosstabulation

			social problems in 9th grade		
			no social problems	yes, social problems	Total
gender	male	Count	48	7	55
		% within gender	87.3%	12.7%	100.0%
	female	Count	30	3	33
		% within gender	90.9%	9.1%	100.0%
Total		Count	78	10	88
		% within gender	88.6%	11.4%	100.0%

4.3 The output follows. I calculated them by using Analyze/Compare Means/Means.

Report

Grade point average in 9th grade

social problems in	dropped out of	Mean	N	Std. Deviation	Variance
no social problems	did not drop out	2.5293	73	.8744	.764
	dropped out of high school	1.5340	5	.6171	.381
	Total	2.4655	78	.8915	.795
yes, social problems	did not drop out	2.3500	5	.8023	.644
	dropped out of high school	2.4180	5	.4218	.178
	Total	2.3840	10	.6054	.366
Total	did not drop out	2.5178	78	.8662	.750
	dropped out of high school	1.9760	10	.6822	.465
	Total	2.4562	88	.8614	.742

Exercises-Chapter 5

5.1 The two-tailed correlations follow. Using a one-tailed versus a two-tailed test did not matter in this case because all of the correlations are statistically significant at the p<.01 level. This would make a difference if correlation were marginally significant. For example, if a p value is .10 as a two-tailed test, it would be non-significant. The same correlation would be significant as a one-tailed test.

Correlations

		ADD score in elementary school	IQ score	Grade point average in 9th grade	grade in ninth grade English
ADD score in elementary school	Pearson Correlation	1.000	-.632**	-.615**	-.478**
	Sig. (2-tailed)	.	.000	.000	.000
	N	88	88	88	88
IQ score	Pearson Correlation	-.632**	1.000	.497**	.370**
	Sig. (2-tailed)	.000	.	.000	.000
	N	88	88	88	88
Grade point average in 9th grade	Pearson Correlation	-.615**	.497**	1.000	.839**
	Sig. (2-tailed)	.000	.000	.	.000
	N	88	88	88	88
grade in ninth grade English	Pearson Correlation	-.478**	.370**	.839**	1.000
	Sig. (2-tailed)	.000	.000	.000	.
	N	88	88	88	88

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

5.2 The output follow. All of the correlations are quite different between the two groups accept the correlation between GPA and grade in 9th grade English, which correlate positively in both groups.

dropped out of high school = did not drop out

Correlations[a]

		ADD score in elementary school	IQ score	Grade point average in 9th grade	grade in ninth grade English
ADD score in elementary school	Pearson Correlation	1.000	-.614**	-.625**	-.493**
	Sig. (2-tailed)	.	.000	.000	.000
	N	78	78	78	78
IQ score	Pearson Correlation	-.614**	1.000	.491**	.365**
	Sig. (2-tailed)	.000	.	.000	.001
	N	78	78	78	78
Grade point average in 9th grade	Pearson Correlation	-.625**	.491**	1.000	.836**
	Sig. (2-tailed)	.000	.000	.	.000
	N	78	78	78	78
grade in ninth grade English	Pearson Correlation	-.493**	.365**	.836**	1.000
	Sig. (2-tailed)	.000	.001	.000	.
	N	78	78	78	78

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

a. dropped out of high school = did not drop out

dropped out of high school = dropped out of high school

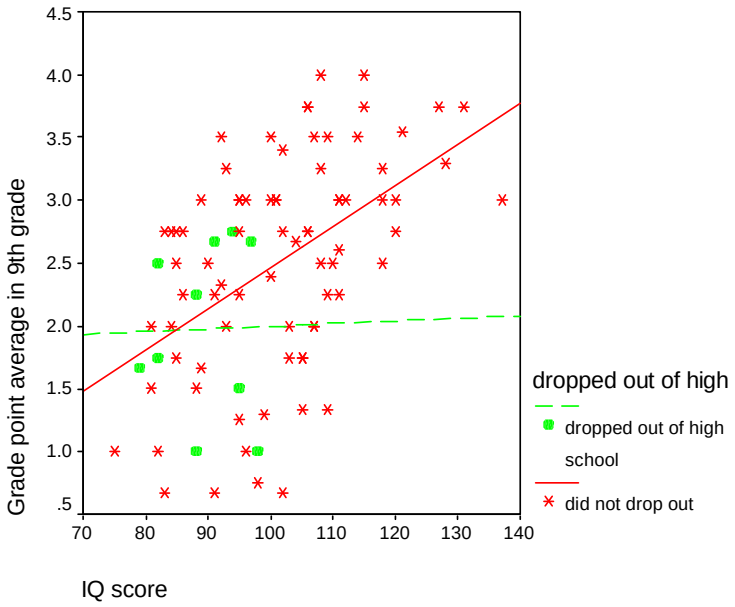
Correlations[a]

		ADD score in elementary school	IQ score	Grade point average in 9th grade	grade in ninth grade English
ADD score in elementary school	Pearson Correlation	1.000	-.137	-.216	.036
	Sig. (2-tailed)	.	.706	.548	.921
	N	10	10	10	10
IQ score	Pearson Correlation	-.137	1.000	.020	-.156
	Sig. (2-tailed)	.706	.	.955	.667
	N	10	10	10	10
Grade point average in 9th grade	Pearson Correlation	-.216	.020	1.000	.825**
	Sig. (2-tailed)	.548	.955	.	.003
	N	10	10	10	10
grade in ninth grade English	Pearson Correlation	.036	-.156	.825**	1.000
	Sig. (2-tailed)	.921	.667	.003	.
	N	10	10	10	10

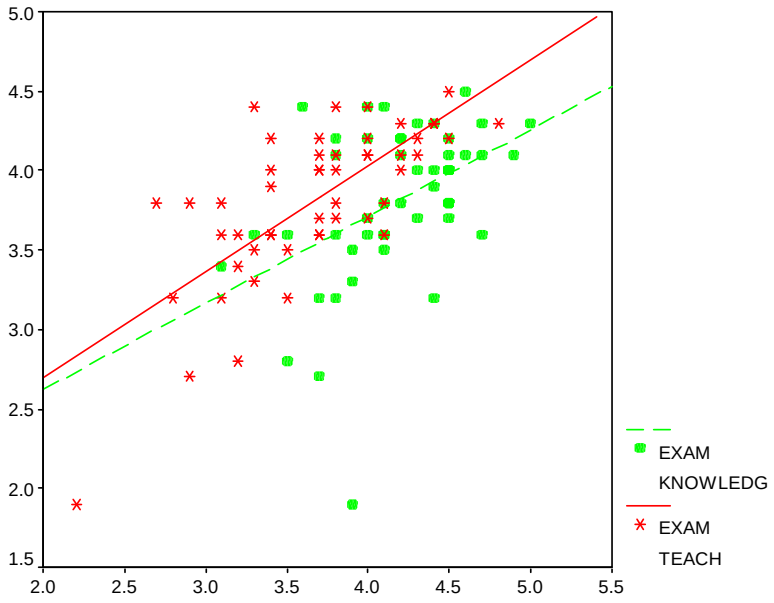
**. Correlation is significant at the 0.01 level (2-tailed).

a. dropped out of high school = dropped out of high school

5.3 A sample scatter plot follows.



5.4 A sample scatterplot follows. It appears that both instructor knowledge and teaching skill are positively correlated with fairness of the exam.



Exercises-Chapter 6

6.1 The regression output follows.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.301[a]	.090	.072	.59

a. Predictors: (Constant), GRADE

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.669	1	1.669	4.775	.034[a]
	Residual	16.776	48	.350		
	Total	18.445	49			

a. Predictors: (Constant), GRADE

b. Dependent Variable: OVERALL

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.718	.843		2.038	.047
	GRADE	.526	.241	.301	2.185	.034

a. Dependent Variable: OVERALL

6.2 A sample of the predicted values and residuals follows. They are the last 2 columns.

	overall	teach	exam	knowledg	grade	enroll	predover	resover
1	3	4	4	5	4	21	3.56	-.16
2	3	3	3	4	3	50	3.40	-.50
3	3	2	2	4	3	800	3.19	-.59
4	4	4	4	4	3	221	3.45	.35
5	3	3	3	4	3	7	3.40	-.40
6	3	3	4	4	3	108	3.40	-.90
7	4	4	4	5	4	54	3.61	.29
8	4	4	4	5	4	99	3.82	.48
9	4	4	4	4	3	51	3.29	.51

6.3 The regression output follows. It is consistent with the output in Table 11.6 of the textbook.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.813[a]	.661	.653	13.98

a. Predictors: (Constant), HEIGHT, SEX

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33886.657	2	16943.328	86.678	.000[a]
	Residual	17397.213	89	195.474		
	Total	51283.870	91			

a. Predictors: (Constant), HEIGHT, SEX

b. Dependent Variable: WEIGHT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-88.199	43.777		-2.015	.047
	SEX	-14.700	4.290	-.302	-3.426	.001
	HEIGHT	3.691	.572	.569	6.450	.000

a. Dependent Variable: WEIGHT

6.4 The regression output follows. These results are consistent with those presented in Table 11.7 in the textbook.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.659[a]	.435	.411	7.66

a. Predictors: (Constant), BLAMBEH, DISTRES1, BLAMPER

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3161.406	3	1053.802	17.959	.000[a]
	Residual	4107.581	70	58.680		
	Total	7268.986	73			

a. Predictors: (Constant), BLAMBEH, DISTRES1, BLAMPER

b. Dependent Variable: DISTRES2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.052	5.782		2.430	.018
	DISTRES1	.640	.103	.564	6.184	.000
	BLAMPER	2.451	1.048	.247	2.338	.022
	BLAMBEH	.272	.990	.029	.275	.784

a. Dependent Variable: DISTRES2

Exercises-Chapter 7

7.1 The output from a single sample t-test follow. They suggest that students who did not read the passage got more answers correct than you would expect by chance, consistent with the conclusion drawn in the textbook.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
score in no passage group	28	46.57	6.83	1.29

One-Sample Test

	Test Value = 20					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
score in no passage group	20.591	27	.000	26.57	23.92	29.22

7.2 The output follows. They are consistent with the results in the textbook.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	ELEVATE	1.4820	10	.3742	.1183
	LEVEL	1.4630	10	.3407	.1077

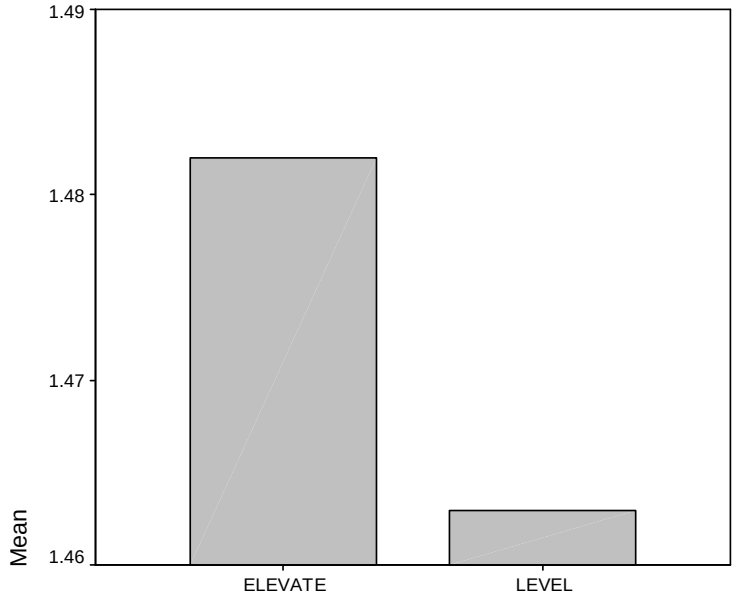
Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	ELEVATE & LEVEL	10	.931	.000

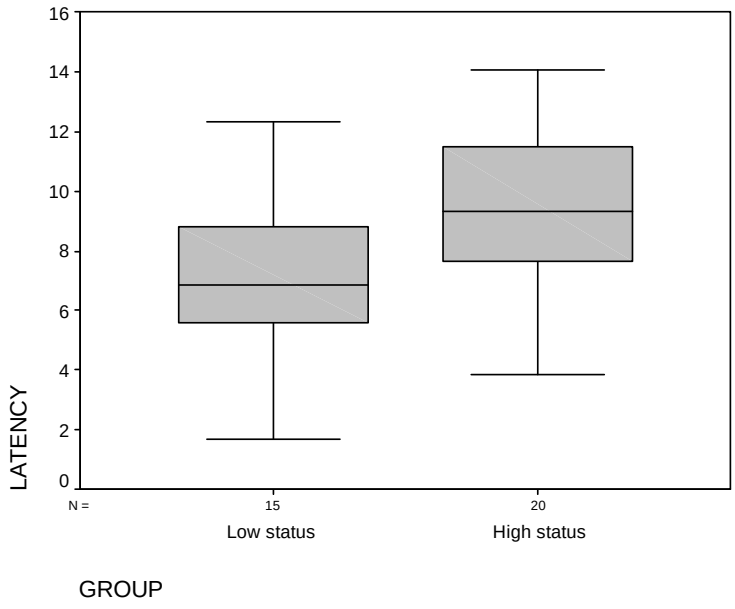
Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	ELEVATE - LEVEL	1.9E-02	.1371	4.337E-02	-7.91E-02	.1171	.438	9	.672

7.3 A sample bar graph follows.



7.4 A boxplot follows. It is similar to the one in the textbook in Figure 14.3.



7.5 The output follows. The results are consistent with the textbook except that our t is positive. Either way, the difference between the 2 groups is statistically significant.

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
weight gain	family therapy	17	7.26	7.16	1.74
	control group	26	-.45	7.99	1.57

Independent Samples Test

		Levene's Test for	t-test for Equality of Means				
		F	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
weight gain	Equal variances assumed	.557	1.676	53	.100	3.46	2.06
	Equal variances not assumed		1.668	50.971	.101	3.46	2.07

7.6 The t-tests follow. After making all 3 possible comparisons, it seems that the family therapy group is the one that is most effective because it is the only one for which weight gain was significantly higher than the control group.

T-Test

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
weight gain	cognitive therapy	29	3.01	7.31	1.36
	family therapy	17	7.26	7.16	1.74

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
weight gain	Equal variances assumed	.016	.898	-1.922	44	.061	-4.26	2.22
	Equal variances not assumed			-1.932	34.229	.062	-4.26	2.20

T-Test

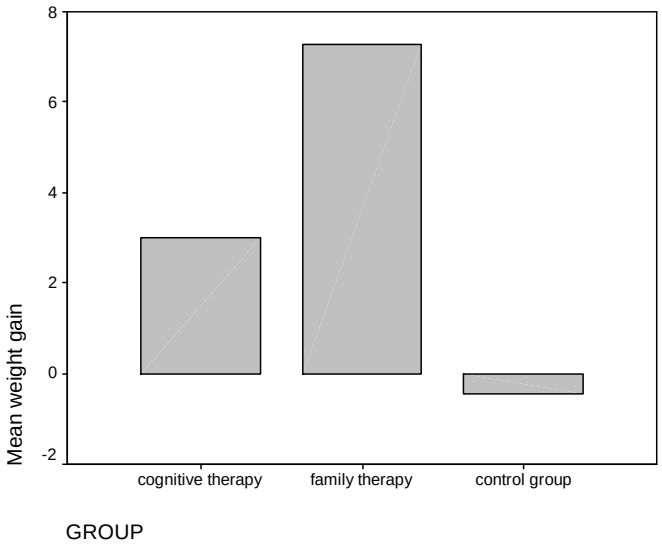
Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
weight gain	cognitive therapy	29	3.01	7.31	1.36
	control group	26	-.45	7.99	1.57

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
weight gain	Equal variances assumed	.557	.459	1.676	53	.100	3.46	2.06
	Equal variances not assumed			1.668	50.971	.101	3.46	2.07

7.7 A sample bar graph follows.



Exercises-Chapter 8

8.1 The results follow. They indicate that there is a significant difference in recall based on condition. Specifically, people in the counting and rhyming conditions had significantly lower recall than all other groups.

ANOVA

RECALL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	351.520	4	87.880	9.085	.000
Within Groups	435.300	45	9.673		
Total	786.820	49			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: RECALL

LSD

(I) GROUP	(J) GROUP	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Counting	Rhyming	1.00E-01	1.39	.943	-2.70	2.90
	Adjective	-4.00*	1.39	.006	-6.80	-1.20
	Imagery	-6.40*	1.39	.000	-9.20	-3.60
	Intentional	-5.00*	1.39	.001	-7.80	-2.20
Rhyming	Counting	-1.00E-01	1.39	.943	-2.90	2.70
	Adjective	-4.10*	1.39	.005	-6.90	-1.30
	Imagery	-6.50*	1.39	.000	-9.30	-3.70
	Intentional	-5.10*	1.39	.001	-7.90	-2.30
Adjective	Counting	4.00*	1.39	.006	1.20	6.80
	Rhyming	4.10*	1.39	.005	1.30	6.90
	Imagery	-2.40	1.39	.091	-5.20	.40
	Intentional	-1.00	1.39	.476	-3.80	1.80
Imagery	Counting	6.40*	1.39	.000	3.60	9.20
	Rhyming	6.50*	1.39	.000	3.70	9.30
	Adjective	2.40	1.39	.091	-.40	5.20
	Intentional	1.40	1.39	.320	-1.40	4.20
Intentional	Counting	5.00*	1.39	.001	2.20	7.80
	Rhyming	5.10*	1.39	.001	2.30	7.90
	Adjective	1.00	1.39	.476	-1.80	3.80
	Imagery	-1.40	1.39	.320	-4.20	1.40

*. The mean difference is significant at the .05 level.

8.2 An edited ANOVA summary table follows.

ANOVA

RECALL

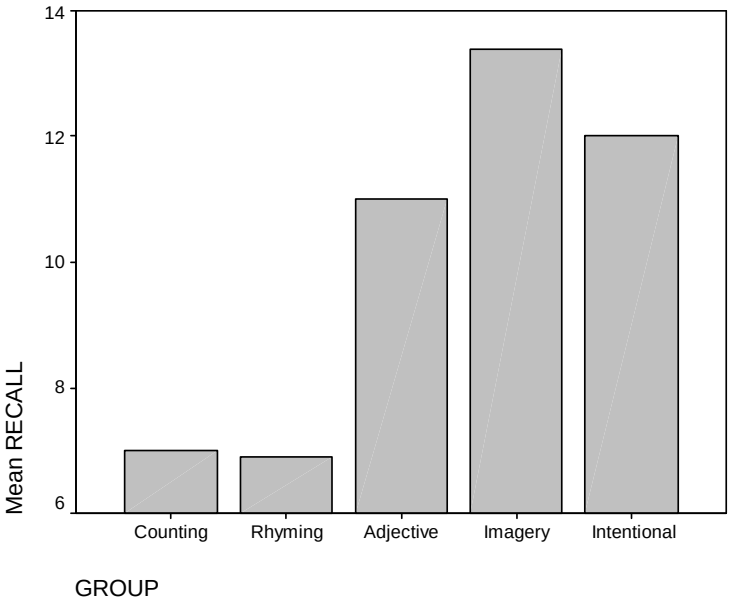
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	351.520	4	87.880	9.085	.000
Within Groups	435.300	45	9.673		
Total	786.820	49			

8.3 I calculated eta squared through Analyze/Compare Means/Means. I could have calculated it also through General Linear Model/Univariate.

Measures of Association

	Eta	Eta Squared
RECALL * GROUP	.668	.447

8.4 A sample bar chart follows.



Exercises-Chapter 9

9.1 The output follows. You need to calculate your own F values by dividing the mean square for groups by the mean square error from the original analysis (8.026). When you do so, the F values are: .16, .31, 9.00, 10.99, and 33.20, for counting, rhyming, adjective, imagery and intentions respectively consistent with the values reported in the textbook.

CONDITIO = Counting

ANOVA[a]

RECALL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.250	1	1.250	.464	.504
Within Groups	48.500	18	2.694		
Total	49.750	19			

a. CONDITIO = Counting

CONDITIO = Rhyming

ANOVA[a]

RECALL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.450	1	2.450	.586	.454
Within Groups	75.300	18	4.183		
Total	77.750	19			

a. CONDITIO = Rhyming

CONDITIO = Adjective

ANOVA[a]

RECALL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	72.200	1	72.200	7.848	.012
Within Groups	165.600	18	9.200		
Total	237.800	19			

a. CONDITIO = Adjective

CONDITIO = Imagery

ANOVA[a]

RECALL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	88.200	1	88.200	6.539	.020
Within Groups	242.800	18	13.489		
Total	331.000	19			

a. CONDITIO = Imagery

CONDITIO = Intentional

ANOVA[a]

RECALL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	266.450	1	266.450	25.229	.000
Within Groups	190.100	18	10.561		
Total	456.550	19			

a. CONDITIO = Intentional

9.2 The output follows. These results are consistent with those in the textbook.

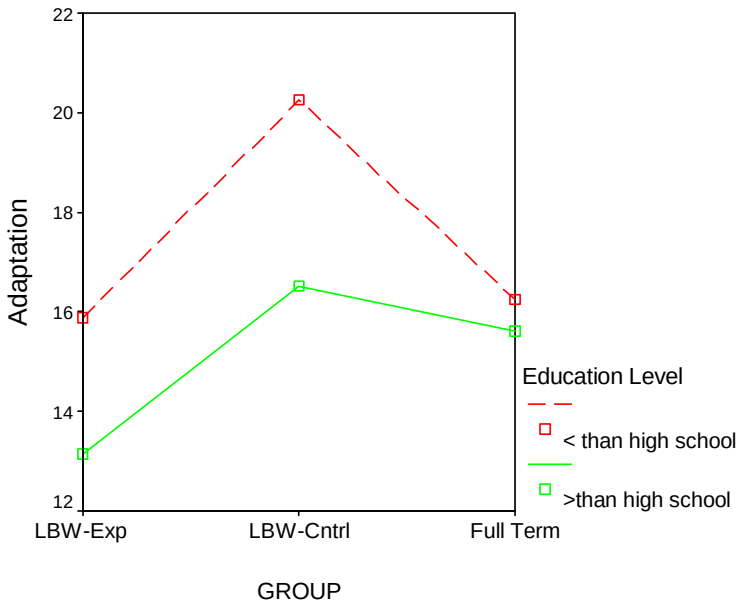
Tests of Between-Subjects Effects

Dependent Variable: maternal role adaptation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	210.854[a]	5	42.171	3.984	.005
Intercept	12707.521	1	12707.521	1200.373	.000
GROUP	122.792	2	61.396	5.800	.006
EDUCATIO	67.688	1	67.688	6.394	.015
GROUP * EDUCATIO	20.375	2	10.188	.962	.390
Error	444.625	42	10.586		
Total	13363.000	48			
Corrected Total	655.479	47			

a. R Squared = .322 (Adjusted R Squared = .241)

9.3 A sample graph follows.



Exercises-Chapter 10

10.1 The within subjects output follows. The results are consistent with the textbook

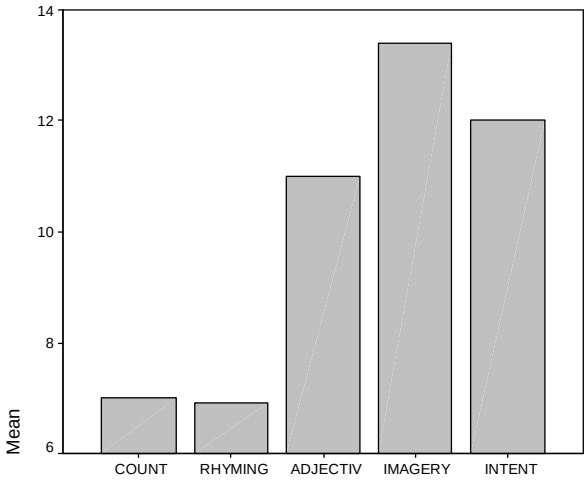
Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
FACTOR1	Sphericity Assumed	351.520	4	87.880	20.218	.000	.692
	Greenhouse-Geisser	351.520	2.051	171.394	20.218	.000	.692
	Huynh-Feldt	351.520	2.664	131.972	20.218	.000	.692
	Lower-bound	351.520	1.000	351.520	20.218	.001	.692
Error(FACTOR1)	Sphericity Assumed	156.480	36	4.347			
	Greenhouse-Geisser	156.480	18.459	8.477			
	Huynh-Feldt	156.480	23.972	6.528			
	Lower-bound	156.480	9.000	17.387			

10.2 Eta squared is included in the previous output.

10.3 A sample graph follows.



10.4 I calculated the new variable, lowproc. Then, I used a paired t-test to compare recall in the imagery and lowproc conditions. I did this because I knew it would calculate the mean difference for me. Then, I used the protected t-test explained in the text using the MS_{error} from the original analysis (see answer to exercise 1). The resulting t-value is 3.82, which is statistically significant with 9 df. Thus, recall was better in the imagery group than in the lower processing conditions.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	IMAGERY	13.40	10	4.50	1.42
	LOWPROC	9.2250	10	2.1745	.6876

Paired Samples Test

		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	IMAGERY - LOWPROC	4.1750	3.2017	1.0125	4.124	9	.003

Exercises-Chapter 11

11.1 The output follow. They are consistent with the data in the text.

ALLEY

	Observed N	Expected N	Residual
A	4	8.0	-4.0
B	5	8.0	-3.0
C	8	8.0	.0
D	15	8.0	7.0
Total	32		

Test Statistics

	ALLEY
Chi-Square[a]	9.250
df	3
Asymp. Sig.	.026

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 8.0.

11.2 The output follows. The results support the hypothesis.

RATING

	Observed N	Expected N	Residual
not at all like me	8	5.0	3.0
somewhat unlike me	10	10.0	.0
neither like me or unlike me	20	20.0	.0
somewhat like me	8	10.0	-2.0
very much like me	4	5.0	-1.0
Total	50		

Test Statistics

	RATING
Chi-Square[a]	2.400
df	4
Asymp. Sig.	.663

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 5.0.

11.3 A sample data file follows.

	bystande	assist	counts
1	.00	yes	11.00
2	1.00	yes	16.00
3	4.00	yes	4.00
4	.00	no	2.00
5	1.00	no	10.00
6	4.00	no	9.00

11.4 The results follow. They are consistent with the textbook.

BYSTANDE * ASSIST Crosstabulation

			ASSIST		
			yes	no	Total
BYSTANDE	.00	Count	11	2	13
		Expected Count	7.8	5.3	13.0
	1.00	Count	16	10	26
		Expected Count	15.5	10.5	26.0
	4.00	Count	4	9	13
		Expected Count	7.8	5.3	13.0
Total		Count	31	21	52
		Expected Count	31.0	21.0	52.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.908[a]	2	.019
Likelihood Ratio	8.295	2	.016
Linear-by-Linear Association	7.321	1	.007
N of Valid Cases	52		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.25.

Exercises-Chapter 12

12.1 The output follows. The z score is the same as the text, but the Ws are different. In both cases, the results suggest that there is a significant difference between groups. (Note: SPSS chooses to work with the sum of the scores in the *larger* group (71), and thus n_1 and n_2 are reversed. This will give you the same z score, with the sign reversed. Notice that z in the output agrees with z in the text.)

Ranks

	GROUP	N	Mean Rank	Sum of Ranks
BIRTHWEI	1	10	7.10	71.00
	2	8	12.50	100.00
	Total	18		

Test Statistics[b]

	BIRTHWEI
Mann-Whitney U	16.000
Wilcoxon W	71.000
Z	-2.132
Asymp. Sig. (2-tailed)	.033
Exact Sig. [2*(1-tailed Sig.)]	.034[a]

a. Not corrected for ties.

b. Grouping Variable: GROUP

12.2 The output follows. There appears to be a significant increase in weight over the course of family therapy.

Wilcoxon Signed Ranks Test

Ra

weight after family therapy - weight before family therapy	Negative Ranks
	Positive Ranks
	Ties
	Total

a. weight after family therapy < weight

b. weight after family therapy > weight

c. weight before family therapy = weigh

Test Statistics[b]

	weight after family therapy - weight before family therapy
Z	-3.101[a]
Asymp. Sig. (2-tailed)	.002

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

12.3 The output follows. There is a significant difference in adaptation based on group.

Ranks

	GROUP	N	Mean Rank
maternal role adaptation (low sores better)	LBW Experimental	29	40.17
	LBW Control	27	60.83
	Full-term	37	42.26
	Total	93	

Friedman Test

Test Statistics[a,b]

	maternal role adaptation (low sores better)
Chi-Square	10.189
df	2
Asymp. Sig.	.006

a. Kruskal Wallis Test

b. Grouping Variable: GROUP

12.4 The output follows. There is a significant difference in recall based on condition.

Ranks

	Mean Rank
COUNT	1.55
RHYMING	1.50
ADJECTIV	3.70
IMAGERY	4.35
INTENT	3.90

Test Statistics[a]

N	10
Chi-Square	31.474
df	4
Asymp. Sig.	.000

a. Friedman Test