

Host

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Newman Keuls Test / Student-Newman-Keuls Post Hoc Analysis

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Import data

Newman Keuls Test Context

NewmanKeuls Test Context
Group descriptives for G3 by studytime

Means

[NewmanKeulsData] D:\DATA ANALYSIS\F Post Hoc Tests\Newman Keuls Test\SPSS_Output\sav\Newman-Keuls-Test-data.sav

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
G3 * studytime	649	100.0%	0	0.0%	649	100.0%

Report

G3

studytime	N	Mean	Std. Deviation	Variance	Minimum	Maximum
1	212	10.84	3.219	10.360	0	18
2	305	12.09	3.243	10.518	0	19
3	97	13.23	2.502	6.261	8	18
4	35	13.06	3.038	9.232	6	19
Total	649	11.91	3.231	10.437	0	19

Assumption and distribution context

Assumption and distribution context
 Boxplot, histogram, normality, and descriptives

Explore

Weekly study time group / post hoc factor

Case Processing Summary

	studytime	Valid		Cases Missing		Total	
		N	Percent	N	Percent	N	Percent
G3	1	212	100.0%	0	0.0%	212	100.0%
	2	305	100.0%	0	0.0%	305	100.0%
	3	97	100.0%	0	0.0%	97	100.0%
	4	35	100.0%	0	0.0%	35	100.0%

Descriptives

studytime		Statistic	Std. Error		
G3	1	Mean	10.84	.221	
		95% Confidence Interval for Mean	Lower Bound	10.41	
			Upper Bound	11.28	
		5% Trimmed Mean	11.04		
		Median	11.00		
		Variance	10.360		
		Std. Deviation	3.219		
		Minimum	0		
		Maximum	18		
		Range	18		
		Interquartile Range	3		
		Skewness	-1.078	.167	
		Kurtosis	3.117	.333	
		2	2	Mean	12.09
95% Confidence Interval for Mean	Lower Bound			11.73	
	Upper Bound			12.46	
5% Trimmed Mean	12.25				
Median	12.00				
Variance	10.518				
Std. Deviation	3.243				

Assumption and distribution context
Boxplot, histogram, normality, and descriptives

Descriptives

studytime		Statistic	Std. Error	
3	Minimum	0		
	Maximum	19		
	Range	19		
	Interquartile Range	4		
	Skewness	-1.028	.140	
	Kurtosis	3.044	.278	
	Mean	13.23	.254	
	95% Confidence Interval for Mean	Lower Bound	12.72	
		Upper Bound	13.73	
	5% Trimmed Mean	13.27		
	Median	13.00		
	Variance	6.261		
	Std. Deviation	2.502		
	Minimum	8		
Maximum	18			
Range	10			
Interquartile Range	4			
Skewness	-.190	.245		
Kurtosis	-.502	.485		
4	Mean	13.06	.514	
	95% Confidence Interval for Mean	Lower Bound	12.01	
		Upper Bound	14.10	
	5% Trimmed Mean	13.07		
	Median	13.00		
	Variance	9.232		
	Std. Deviation	3.038		
	Minimum	6		
	Maximum	19		
	Range	13		
	Interquartile Range	4		
	Skewness	.209	.398	
	Kurtosis	-.339	.778	

Assumption and distribution context
 Boxplot, histogram, normality, and descriptives

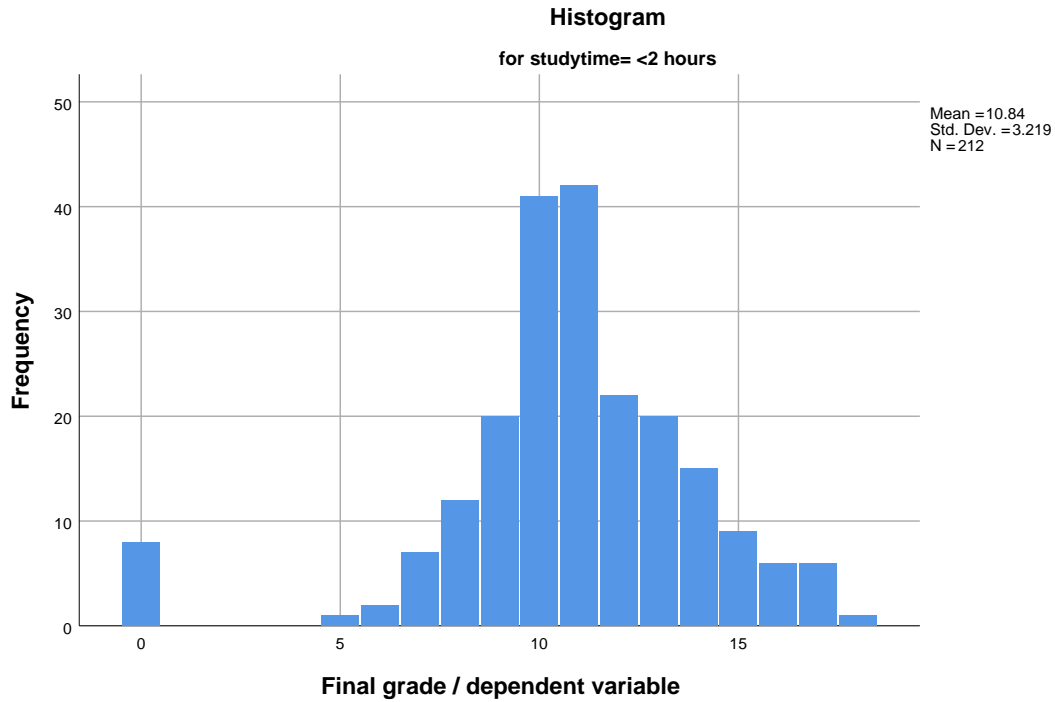
Tests of Normality

studytime	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
G3 1	.161	212	.000	.898	212	.000
2	.125	305	.000	.917	305	.000
3	.103	97	.013	.970	97	.025
4	.136	35	.099	.955	35	.166

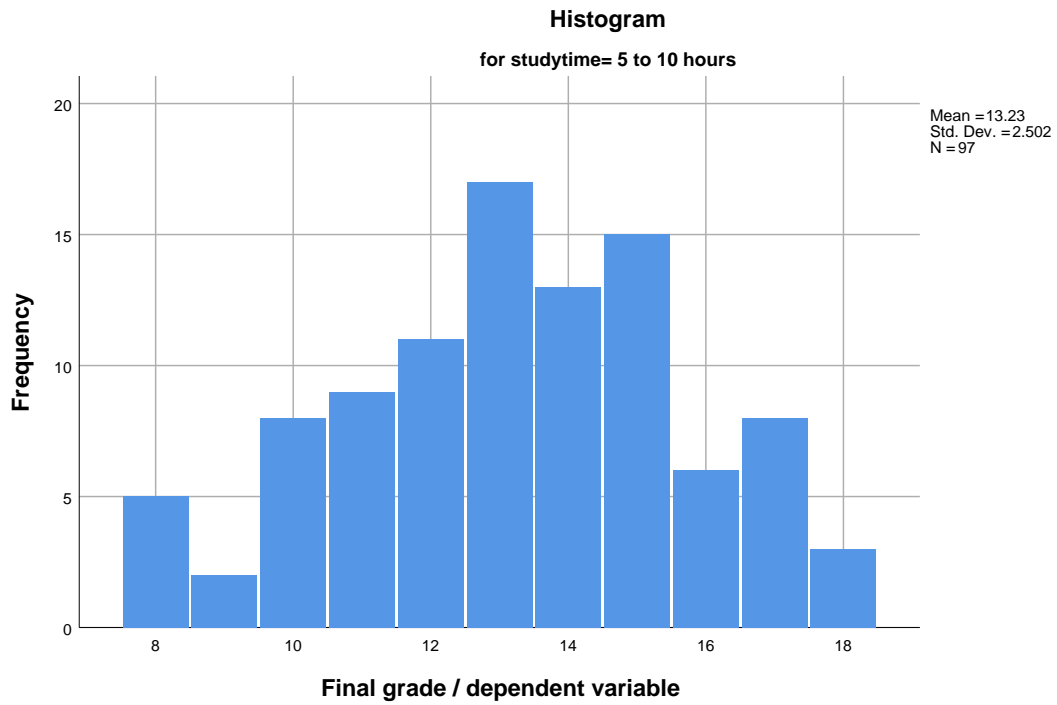
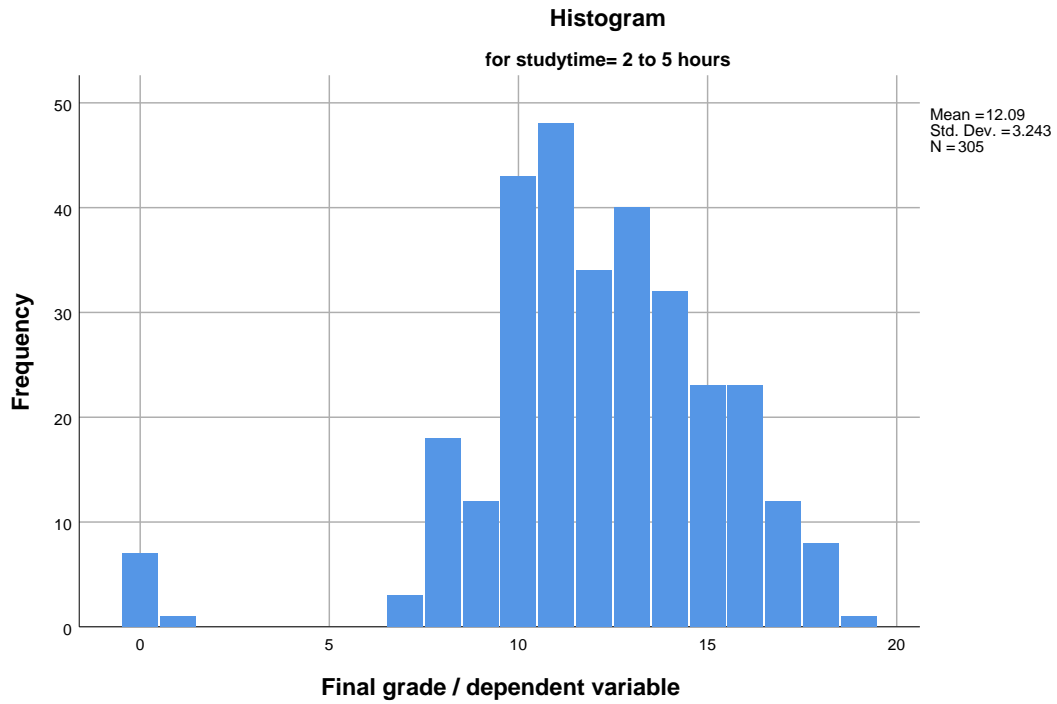
a. Lilliefors Significance Correction

Final grade / dependent variable

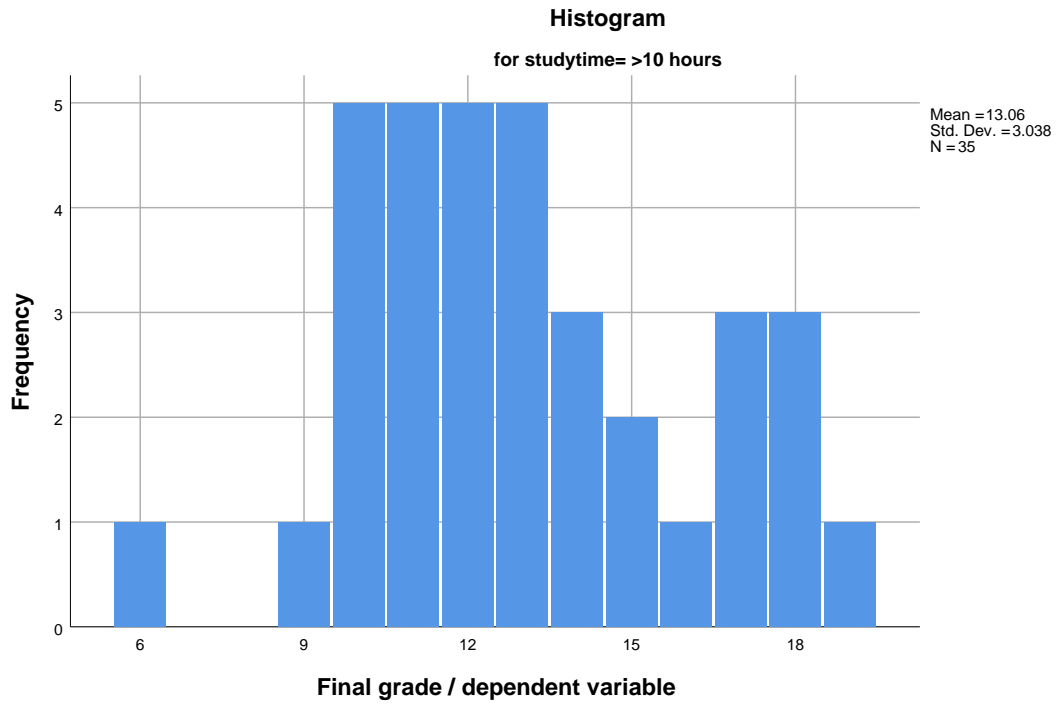
Histograms



Assumption and distribution context
Boxplot, histogram, normality, and descriptives



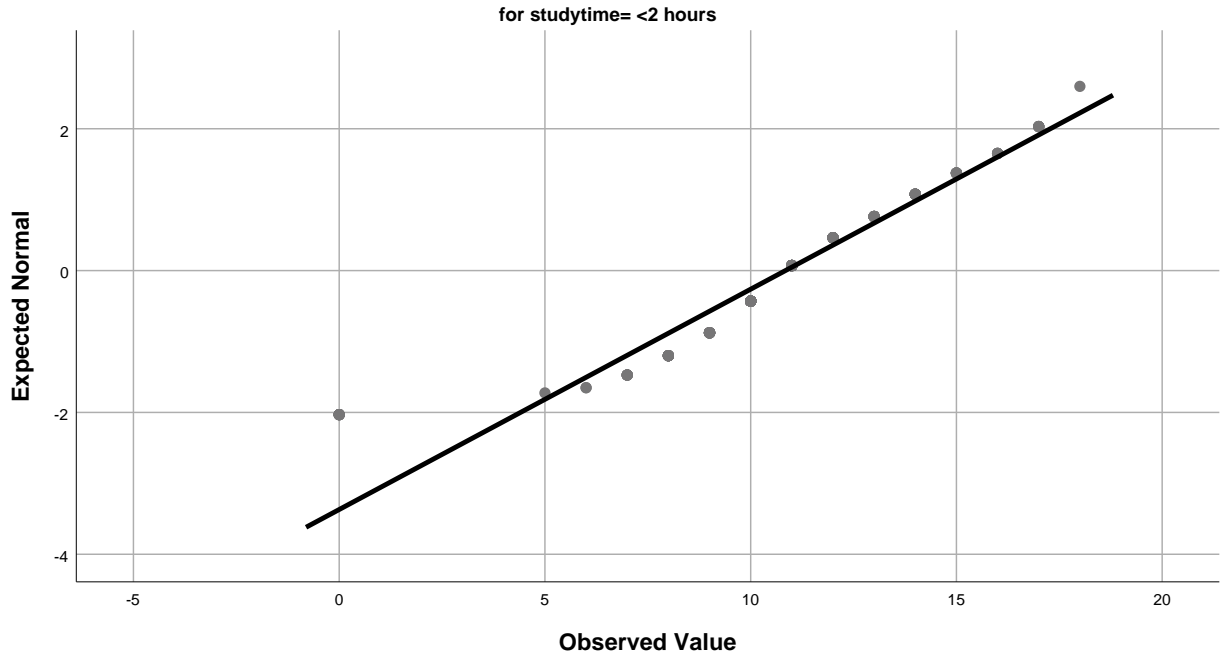
Assumption and distribution context
Boxplot, histogram, normality, and descriptives



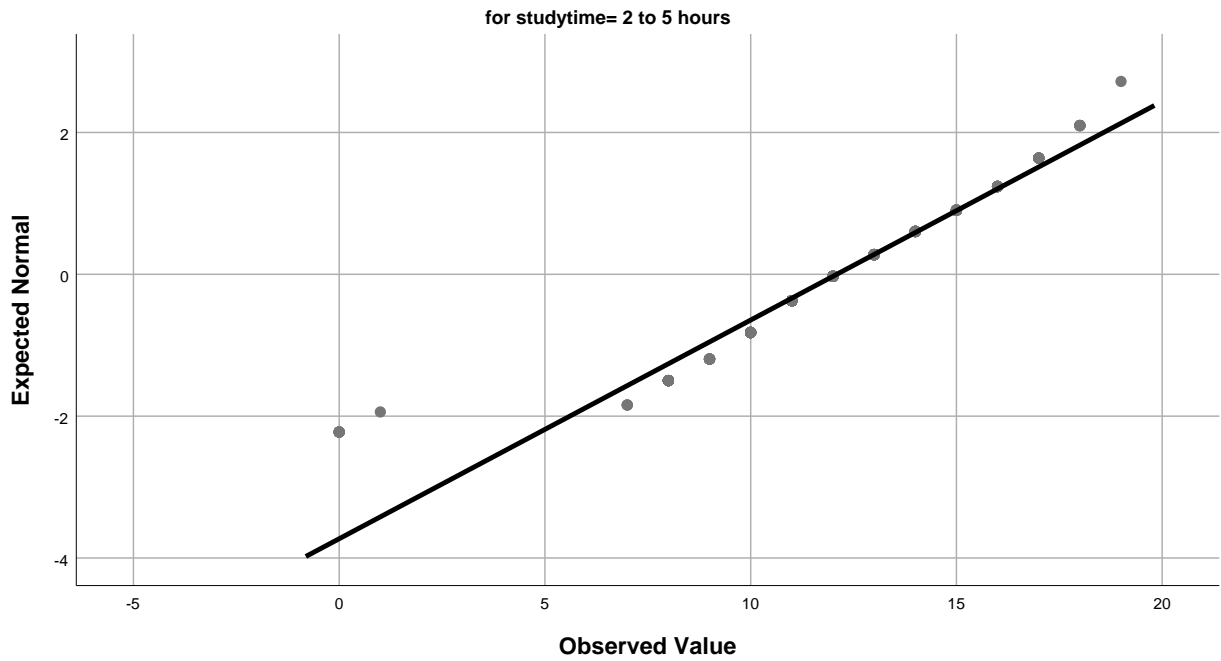
Normal Q-Q Plots

Assumption and distribution context
Boxplot, histogram, normality, and descriptives

Normal Q-Q Plot of Final grade / dependent variable

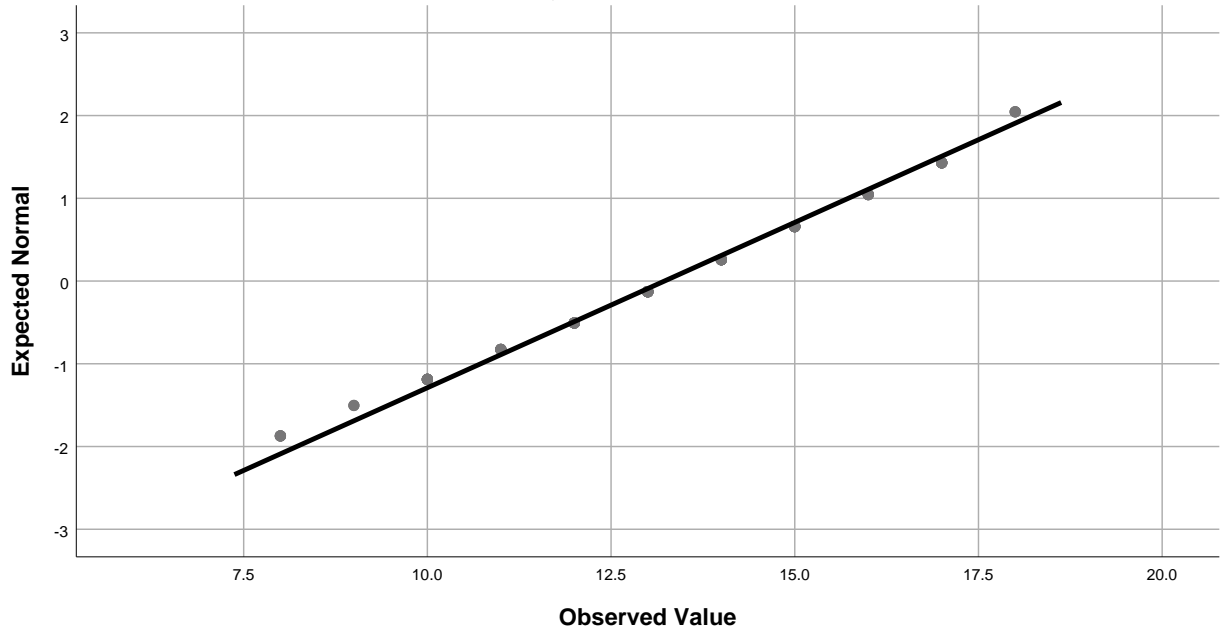


Normal Q-Q Plot of Final grade / dependent variable

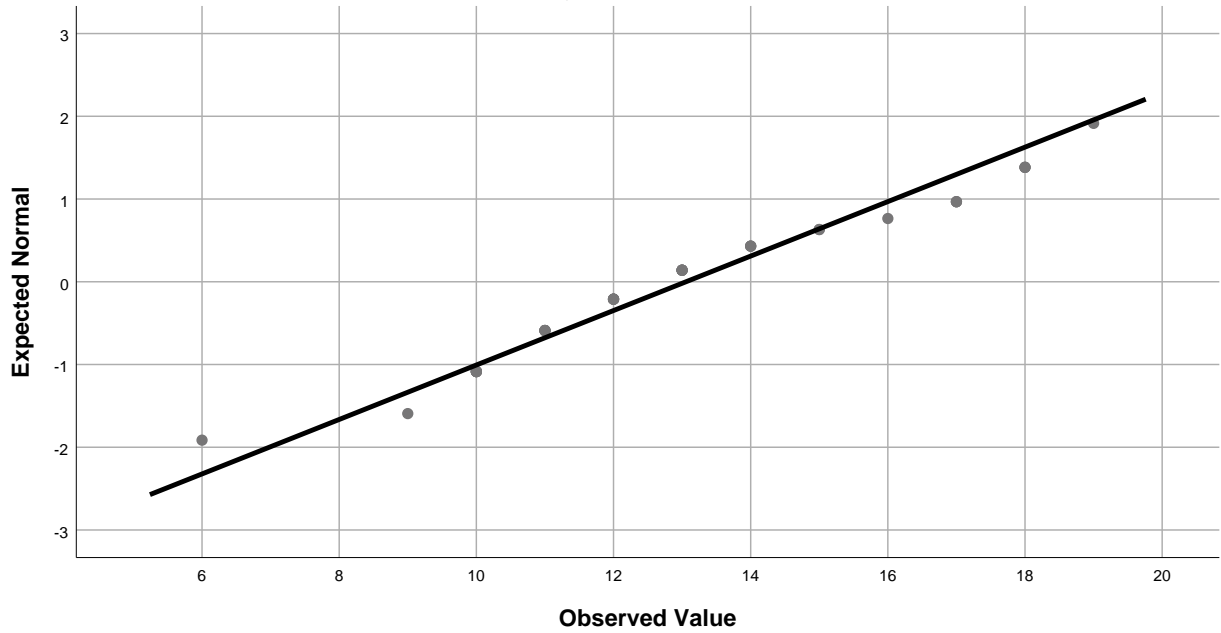


Assumption and distribution context
Boxplot, histogram, normality, and descriptives

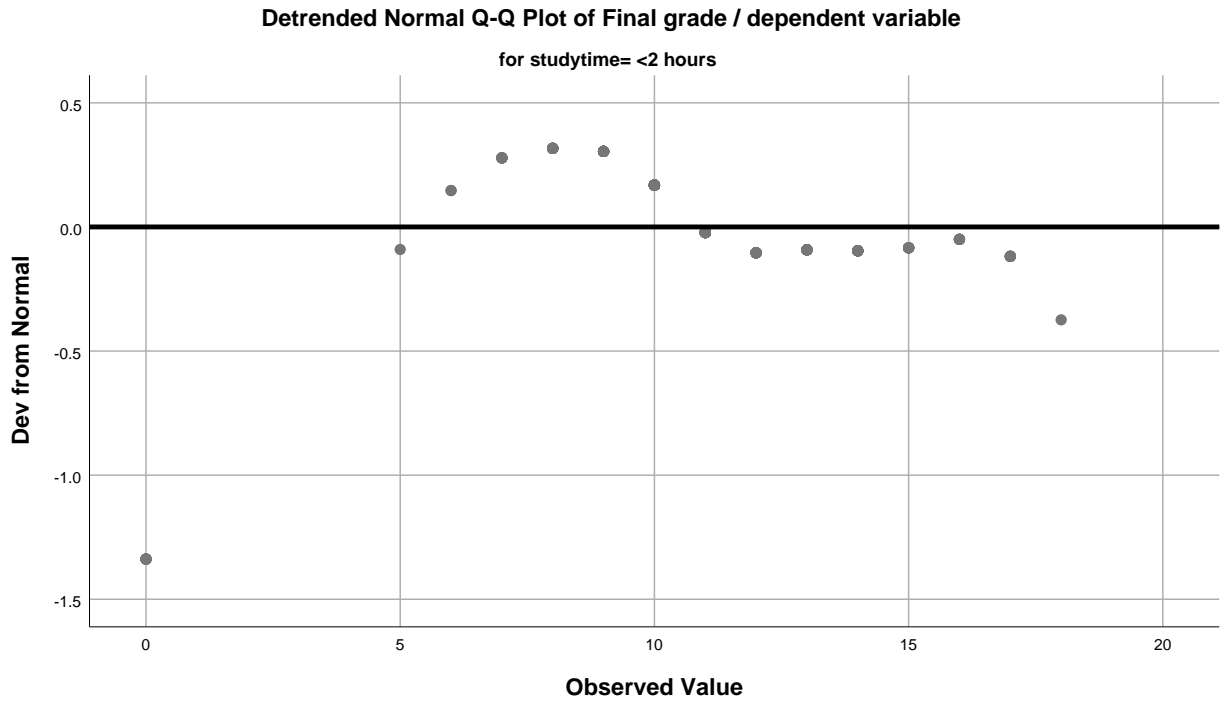
Normal Q-Q Plot of Final grade / dependent variable
for studytime= 5 to 10 hours



Normal Q-Q Plot of Final grade / dependent variable
for studytime= >10 hours

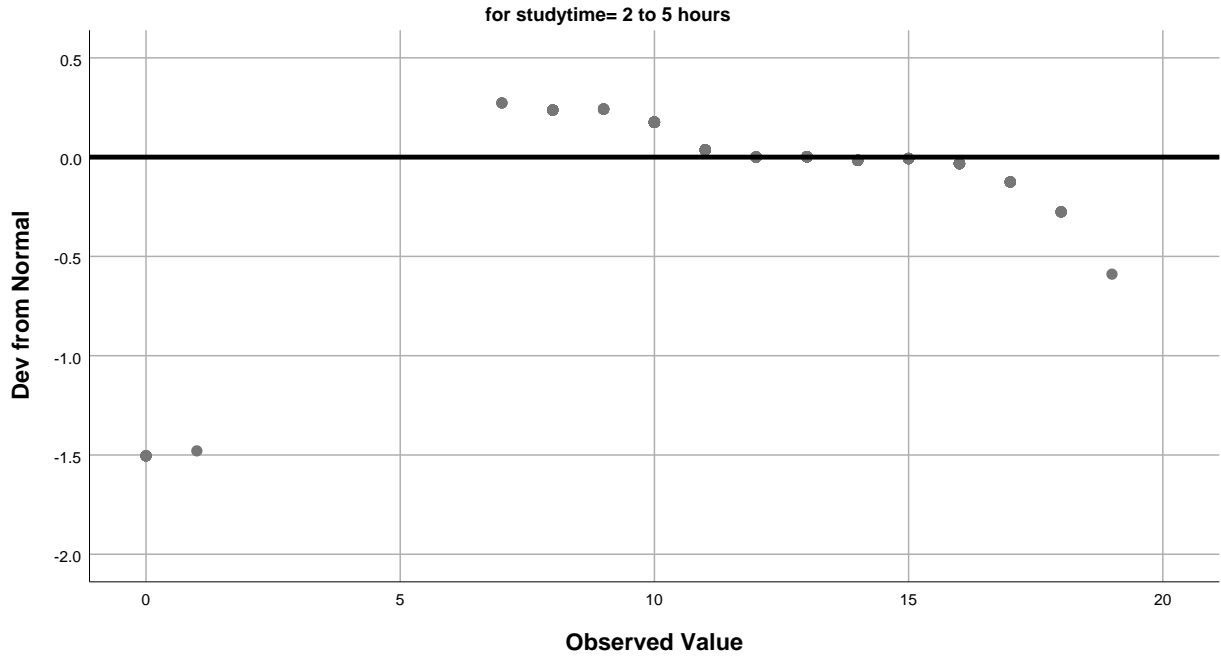


Detrended Normal Q-Q Plots

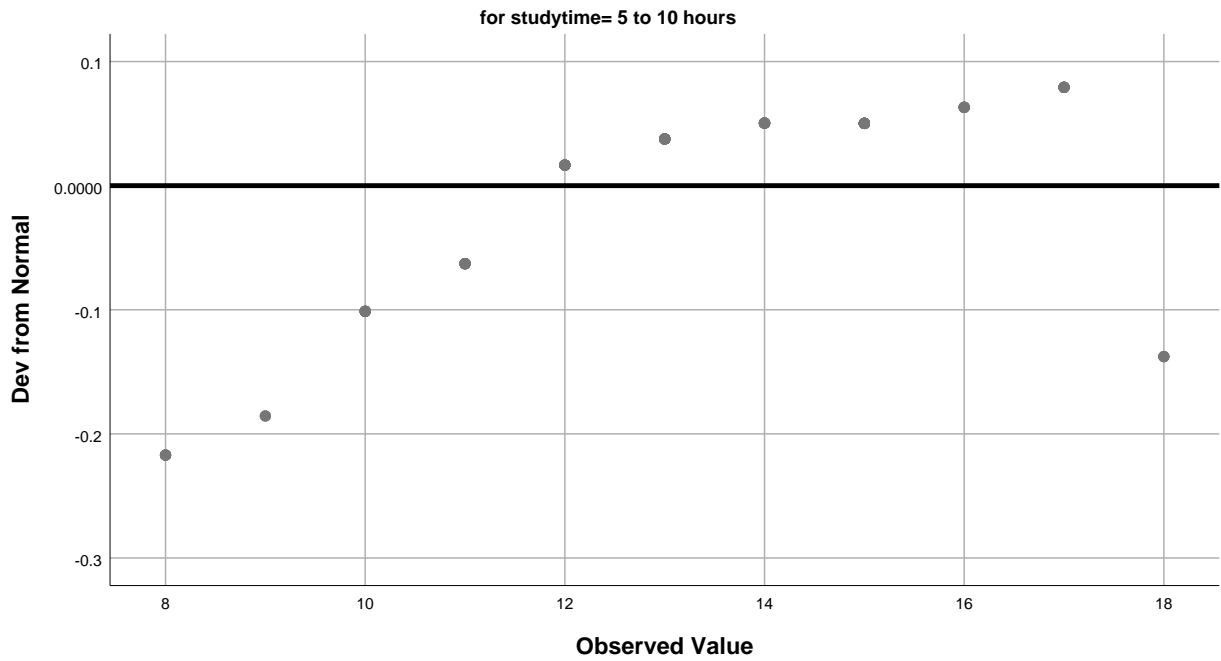


Assumption and distribution context
Boxplot, histogram, normality, and descriptives

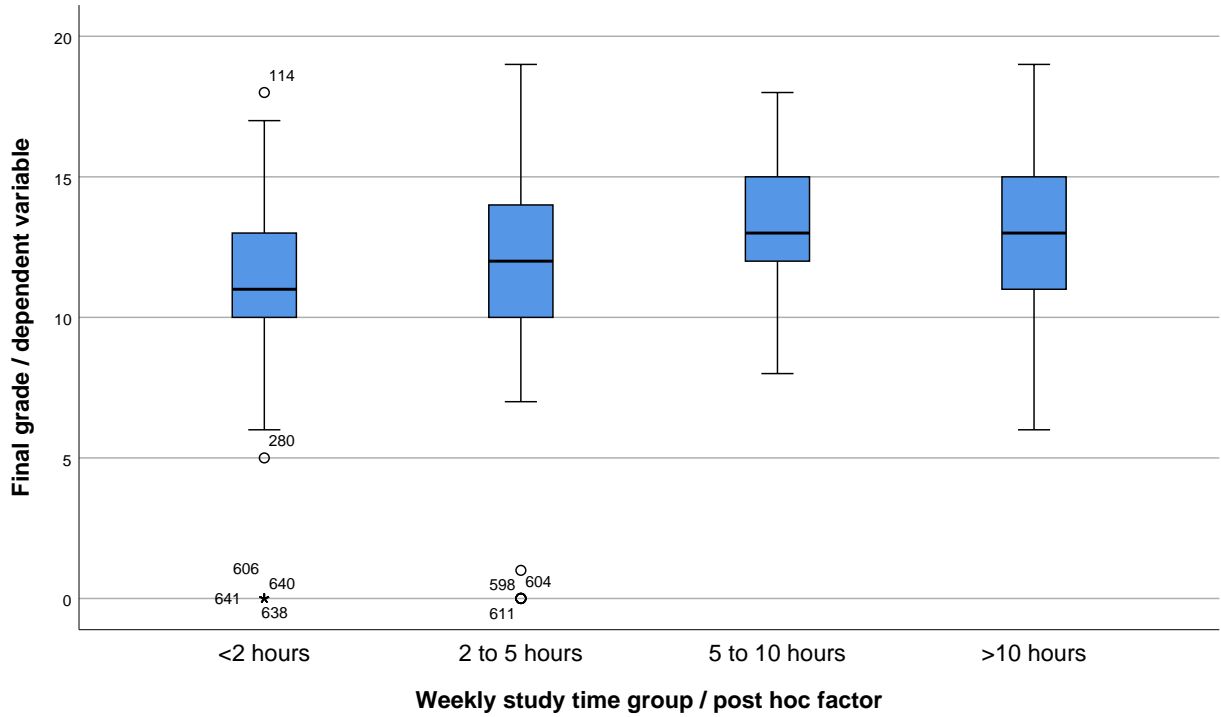
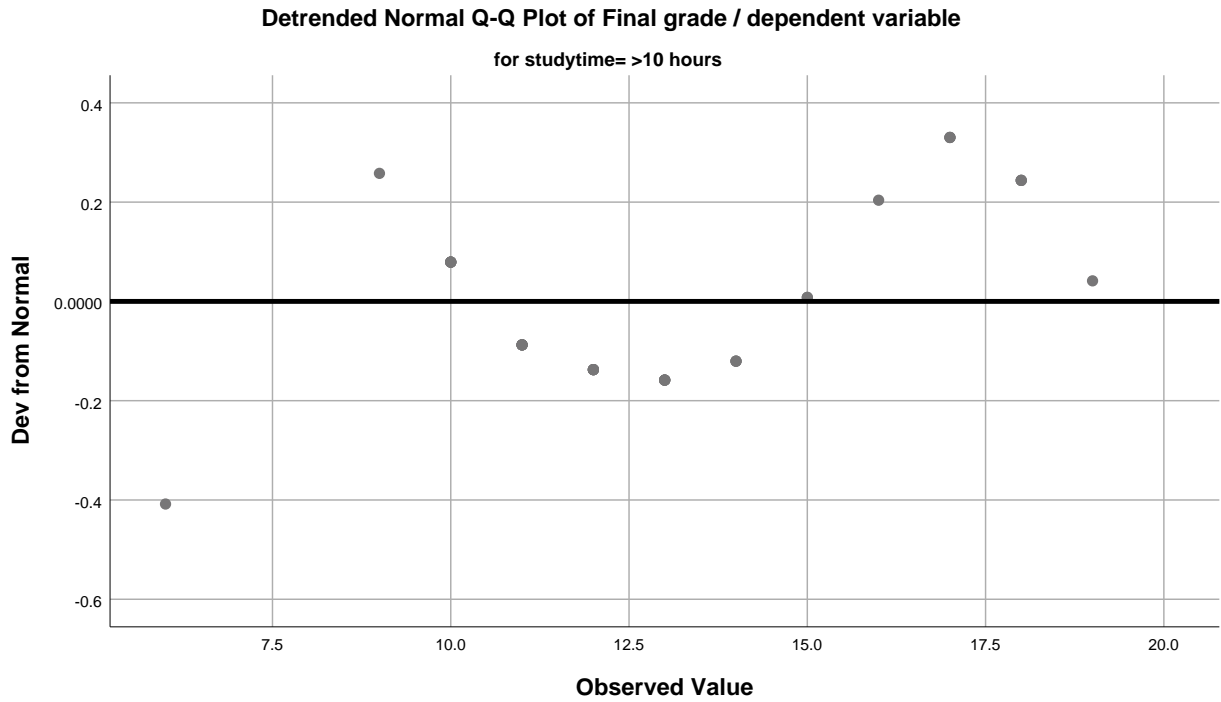
Detrended Normal Q-Q Plot of Final grade / dependent variable



Detrended Normal Q-Q Plot of Final grade / dependent variable



Assumption and distribution context
 Boxplot, histogram, normality, and descriptives



>Warning # 2003. Command name: TITLE

Assumption and distribution context
Boxplot, histogram, normality, and descriptives

>The title given exceeds 60 characters in length. The first 60 characters will
1
>be used.

One-way ANOVA with Newman Keuls / Student-Newman-Keuls Post

One-way ANOVA with Newman Keuls / Student-Newman-Keuls Post
 Dependent variable: G3; factor: studytime

Oneway

Descriptives

G3

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum
					Lower Bound	Upper Bound	
1	212	10.84	3.219	.221	10.41	11.28	0
2	305	12.09	3.243	.186	11.73	12.46	0
3	97	13.23	2.502	.254	12.72	13.73	8
4	35	13.06	3.038	.514	12.01	14.10	6
Total	649	11.91	3.231	.127	11.66	12.16	0

Descriptives

G3

	Maximum
1	18
2	19
3	18
4	19
Total	19

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
G3	Based on Mean	.985	3	645	.400
	Based on Median	1.026	3	645	.380
	Based on Median and with adjusted df	1.026	3	609.885	.380
	Based on trimmed mean	1.081	3	645	.356

One-way ANOVA with Newman Keuls / Student-Newman-Keuls Post
 Dependent variable: G3; factor: studytime

ANOVA

G3

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	465.078	3	155.026	15.876	.000
Within Groups	6298.189	645	9.765		
Total	6763.267	648			

Post Hoc Tests

Homogeneous Subsets

G3

Student-Newman-Keuls^{a,b}

studytime	N	Subset for alpha = 0.05		
		1	2	3
1	212	10.84		
2	305		12.09	
4	35			13.06
3	97			13.23
Sig.		1.000	1.000	.723

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 85.331.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.