The CONTENTS Procedure

Data Set Name	BIO.FRUSTRATION	**Observations**	140
Member Type	DATA	**Variables**	7
Engine	V9	**Indexes**	0
Created	Wednesday, April 11, 2012 09:45:52 AM	**Observation Length**	64
Last Modified	Wednesday, April 11, 2012 09:45:52 AM	**Deleted Observations**	0
Protection		**Compressed**	NO
Data Set Type		**Sorted**	YES
Label	Written by SAS		
Data Representation	WINDOWS_32		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information	
Data Set Page Size	4096
Number of Data Set Pages	3
First Data Page	1
Max Obs per Page	63
Obs in First Data Page	36
Number of Data Set Repairs	0
Filename	H:_Amy Docs\UF\000 Spring 2012\PHC6052\SAS Dataset Library\frustration.sas7bdat
Release Created	9.0201M0
Host Created	XP_PRO

Alphabetic List of Variables and Attributes				
#	**Variable**	**Type**	**Len**	**Label**
1	Business	Num	8	
2	English	Num	8	
5	FrustrationScore	Num	8	Frustration Score
6	Major	Char	11	
7	Major2	Num	8	
3	Mathematics	Num	8	
4	Psychology	Num	8	

View Variables

The CONTENTS Procedure

Sort Information	
Sortedby	Major
Validated	YES
Character Set	ANSI

ANOVA: Compare frustration by major with Tukey and Bonferroni multiple comparisons

The ANOVA Procedure

Class Level Information		
Class	Levels	Values
Major	4	Business English Mathematics Psychology

Number of Observations Read	140
Number of Observations Used	140

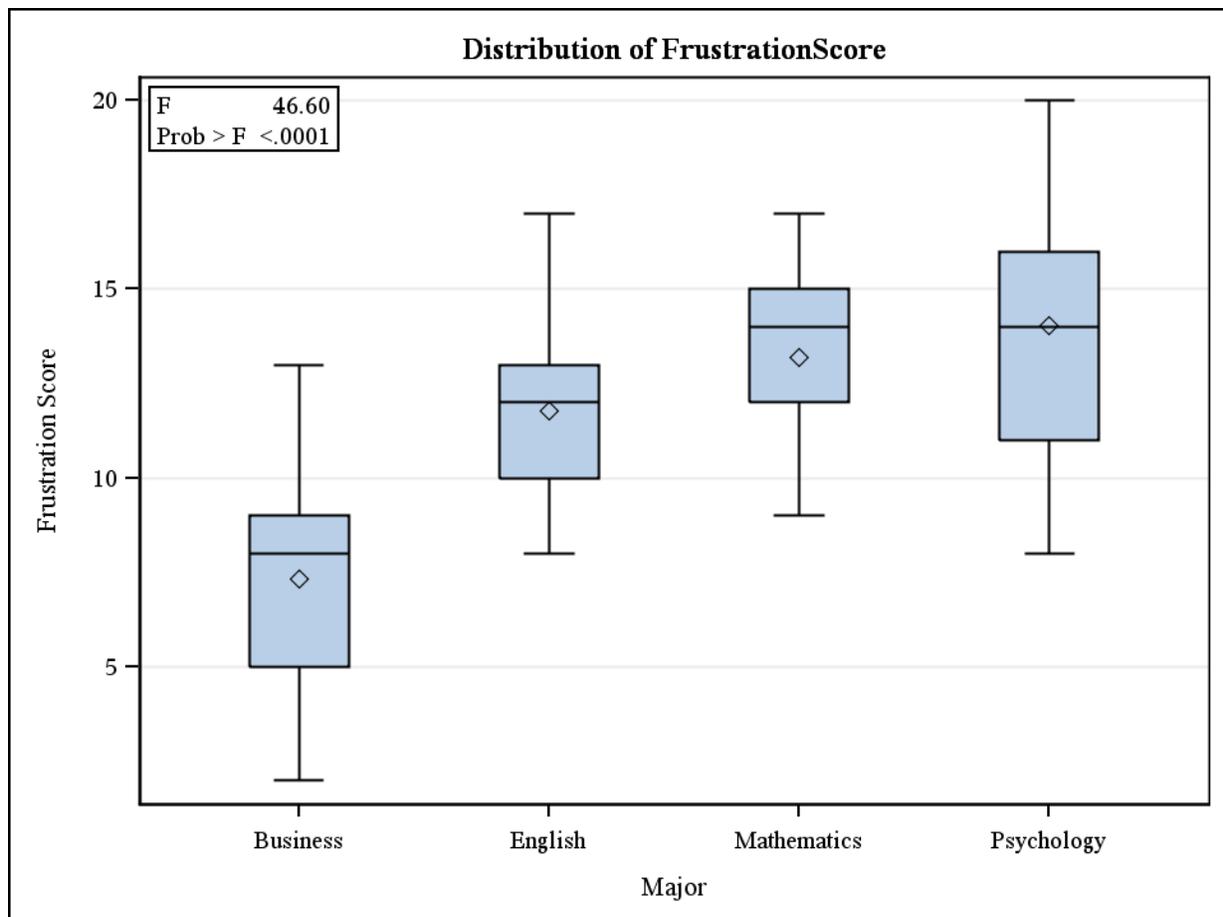# ANOVA: Compare frustration by major with Tukey and Bonferroni multiple comparisons

The ANOVA Procedure

Dependent Variable: FrustrationScore   Frustration Score

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	939.850000	313.283333	46.60	<.0001
Error	136	914.285714	6.722689		
Corrected Total	139	1854.135714			

R-Square	Coeff Var	Root MSE	FrustrationScore Mean
0.506894	22.39322	2.592815	11.57857

Source	DF	Anova SS	Mean Square	F Value	Pr > F
Major	3	939.8500000	313.2833333	46.60	<.0001

Distribution of FrustrationScore
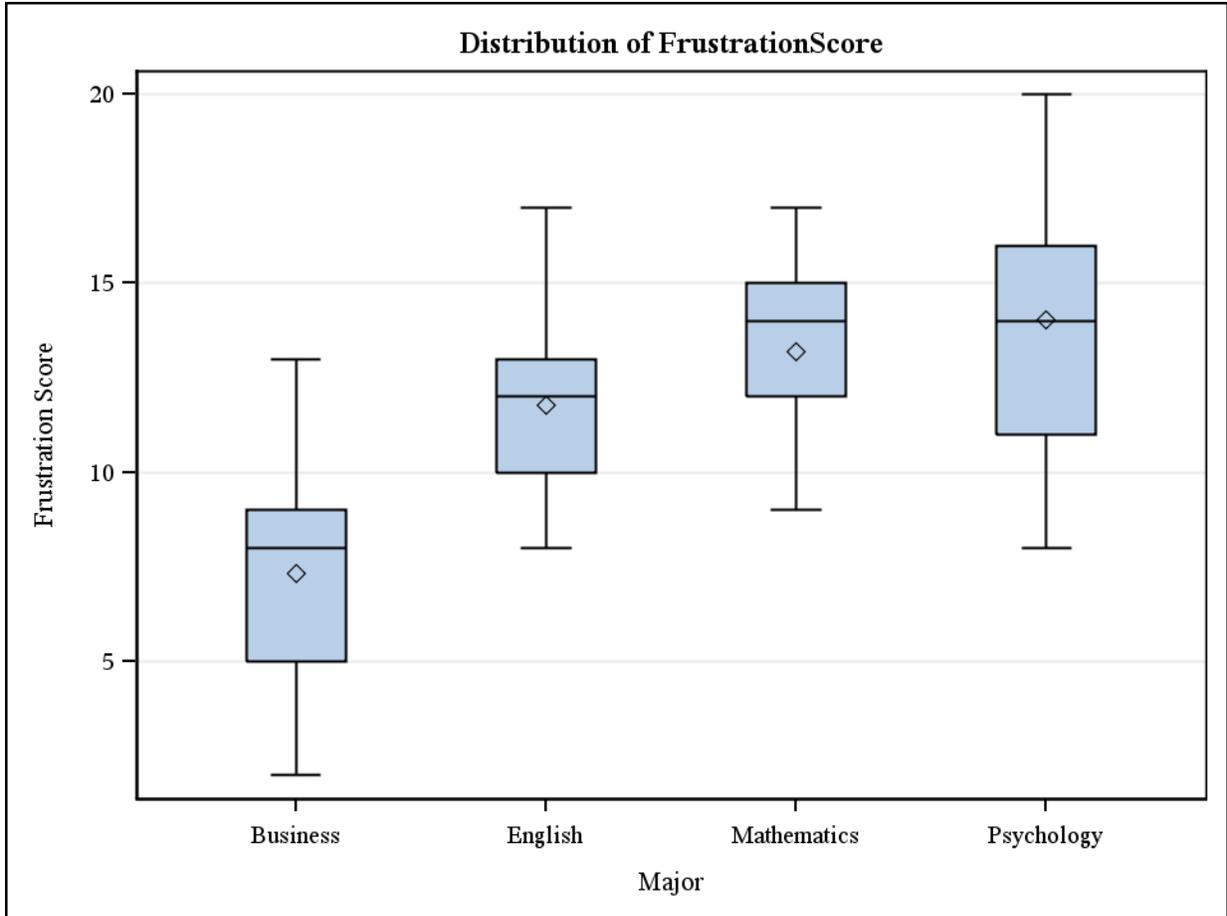
ANOVA: Compare frustration by major with Tukey and Bonferroni multiple comparisons

The ANOVA Procedure

Tukey's Studentized Range (HSD) Test for FrustrationScore

Note: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ.

Alpha	0.05
Error Degrees of Freedom	136
Error Mean Square	6.722689
Critical Value of Studentized Range	3.67848
Minimum Significant Difference	1.6122

Means with the same letter are not significantly different.		Mean	N	Major
Tukey Grouping		**Mean**	**N**	**Major**
	A	14.0286	35	Psychology
	A			
B	A	13.2000	35	Mathematics
B				
B		11.7714	35	English
	C	7.3143	35	Business

ANOVA: Compare frustration by major with Tukey and Bonferroni multiple comparisons

The ANOVA Procedure

Bonferroni (Dunn) t Tests for FrustrationScore

Note: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ.

Alpha	0.05
Error Degrees of Freedom	136
Error Mean Square	6.722689
Critical Value of t	2.67740
Minimum Significant Difference	1.6595

Means with the same letter are not significantly different.				
Bon Grouping		Mean	N	Major
	A	14.0286	35	Psychology
	A			
B	A	13.2000	35	Mathematics
B				
B		11.7714	35	English
	C	7.3143	35	Business

QQ plots and standard 95% confidence intervals by Major

The UNIVARIATE Procedure
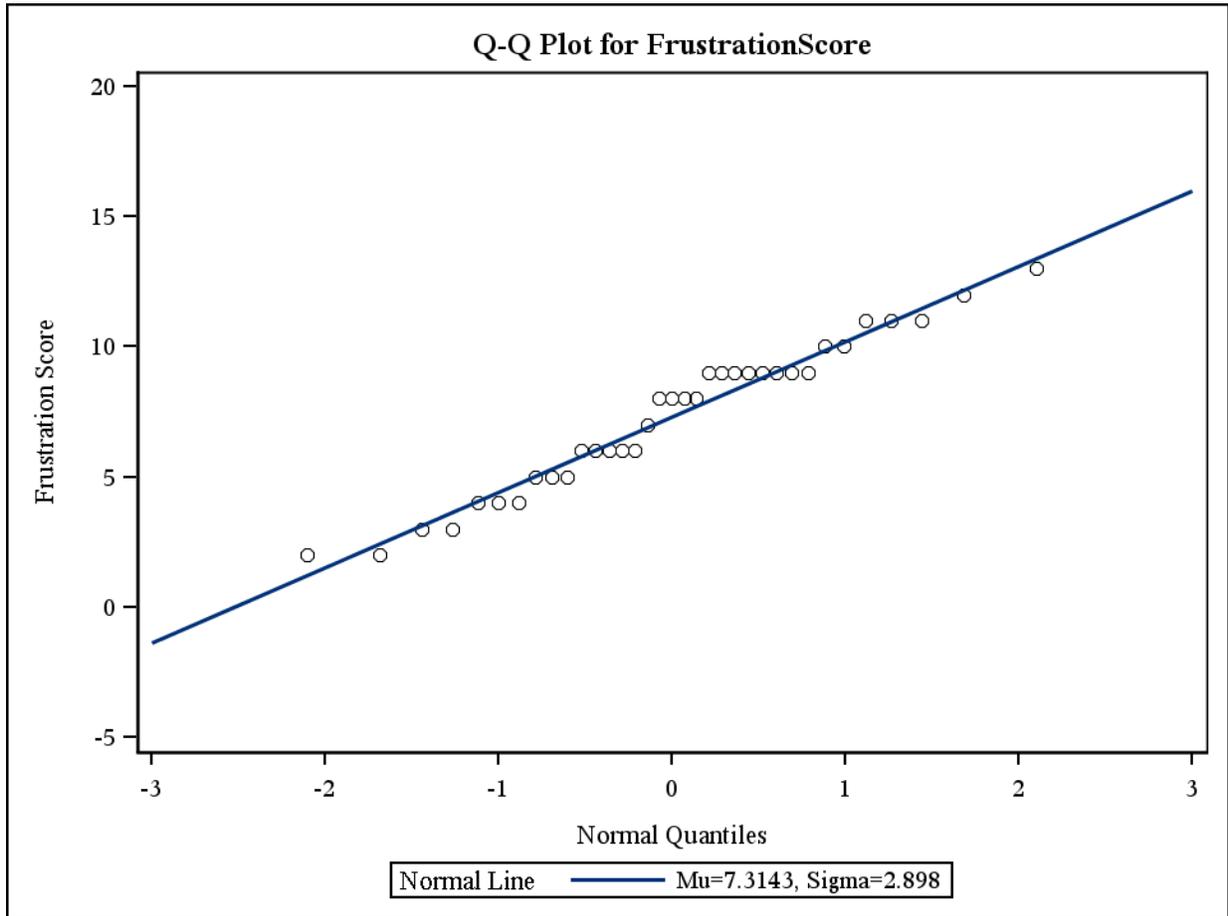## *Variable: FrustrationScore (Frustration Score)*

Major=Business

Basic Confidence Limits Assuming Normality			
Parameter	**Estimate**	**95% Confidence Limits**	
Mean	7.31429	6.31879	8.30978
Std Deviation	2.89799	2.34410	3.79695
Variance	8.39832	5.49480	14.41680

QQ plots and standard 95% confidence intervals by Major

The UNIVARIATE Procedure
Variable: FrustrationScore (Frustration Score)

Major=Business

Q-Q Plot for FrustrationScore

Normal Line — Mu=7.3143, Sigma=2.898

QQ plots and standard 95% confidence intervals by Major

The UNIVARIATE Procedure
Variable: FrustrationScore (Frustration Score)
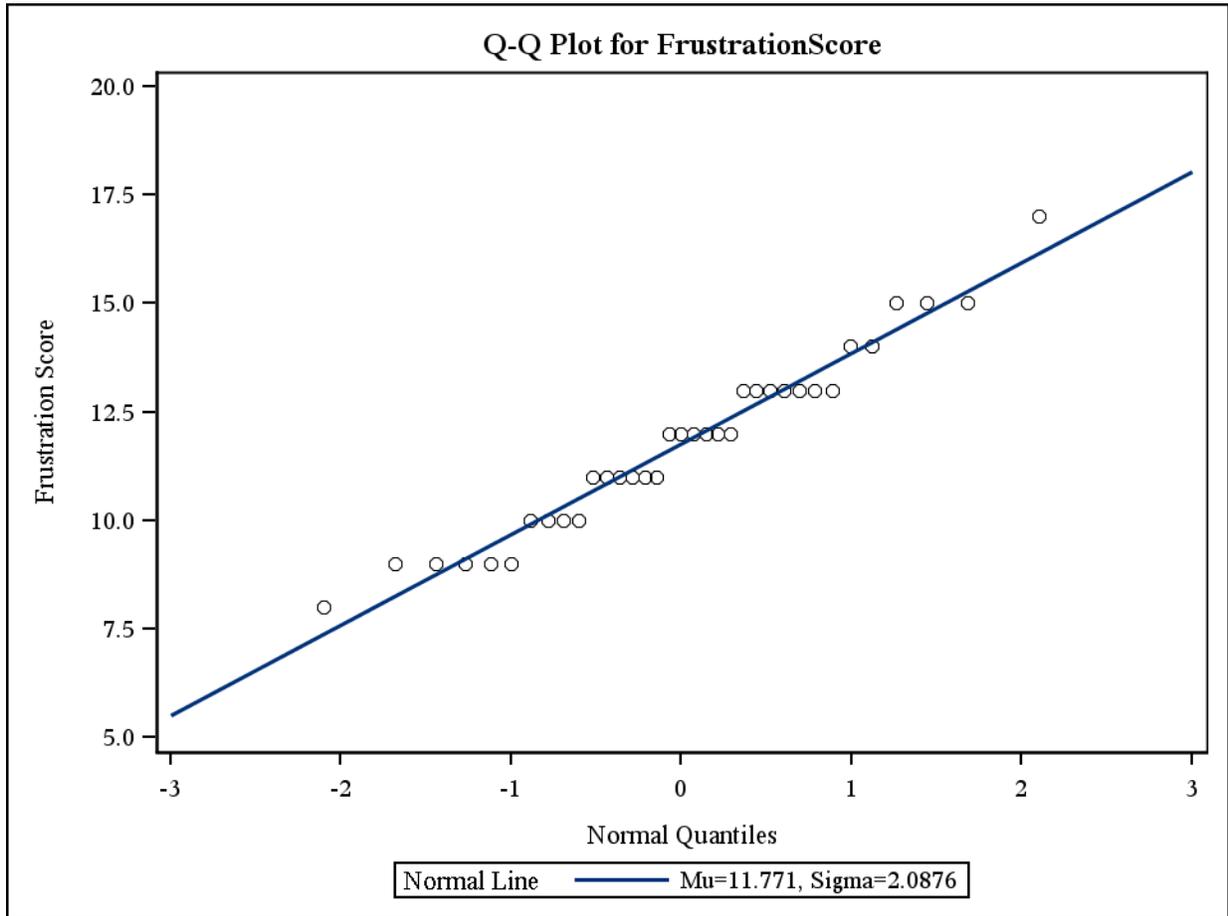
Major=English

Basic Confidence Limits Assuming Normality			
Parameter	Estimate	95% Confidence Limits	
Mean	11.77143	11.05432	12.48854
Std Deviation	2.08758	1.68858	2.73515
Variance	4.35798	2.85132	7.48104

QQ plots and standard 95% confidence intervals by Major

The UNIVARIATE Procedure
Variable: FrustrationScore (Frustration Score)

Major=English

Q-Q Plot for FrustrationScore

Normal Line — Mu=11.771, Sigma=2.0876

QQ plots and standard 95% confidence intervals by Major

The UNIVARIATE Procedure
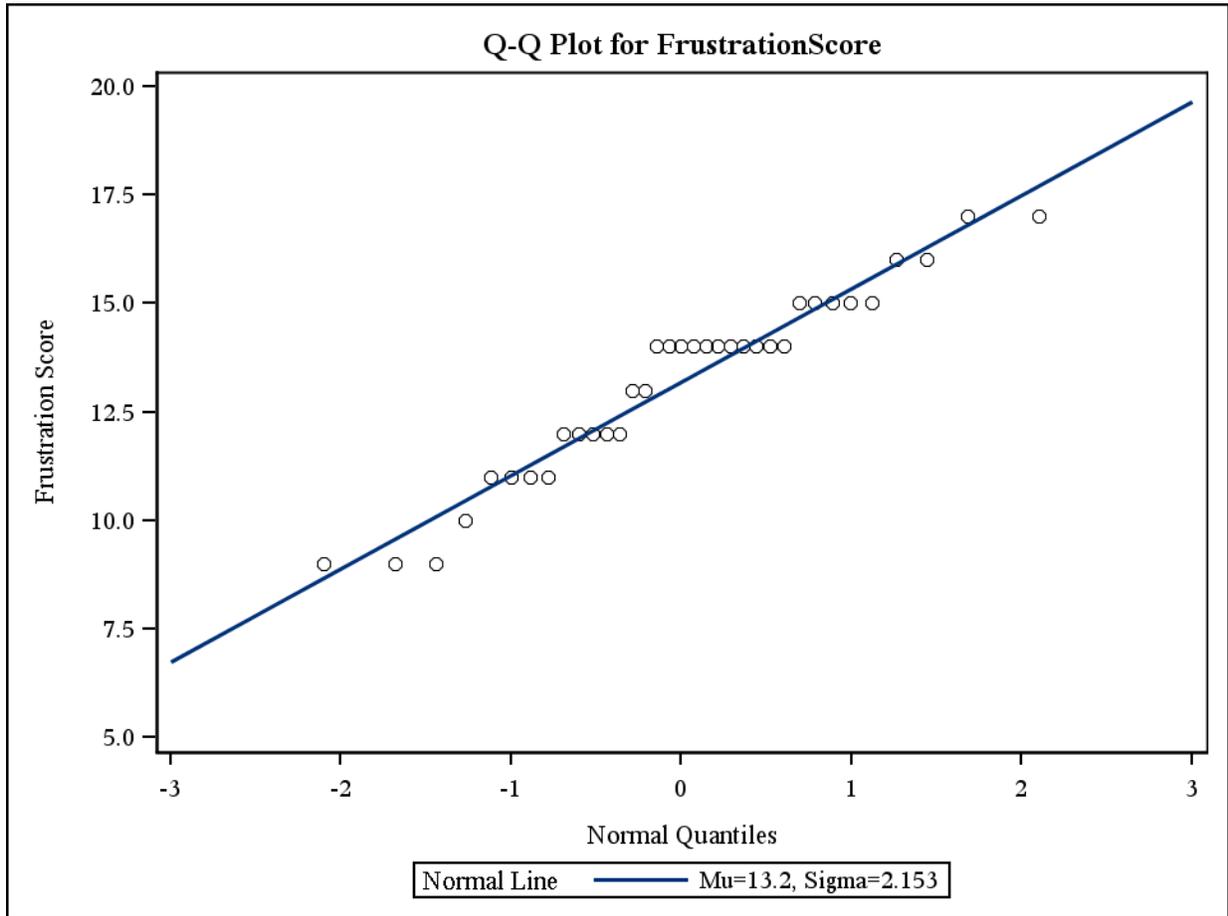### Variable: FrustrationScore (Frustration Score)

Major=Mathematics

Basic Confidence Limits Assuming Normality			
Parameter	Estimate	95% Confidence Limits	
Mean	13.20000	12.46043	13.93957
Std Deviation	2.15297	1.74148	2.82083
Variance	4.63529	3.03275	7.95708

QQ plots and standard 95% confidence intervals by Major

The UNIVARIATE Procedure
Variable: FrustrationScore (Frustration Score)

Major=Mathematics

Q-Q Plot for FrustrationScore

QQ plots and standard 95% confidence intervals by Major

The UNIVARIATE Procedure
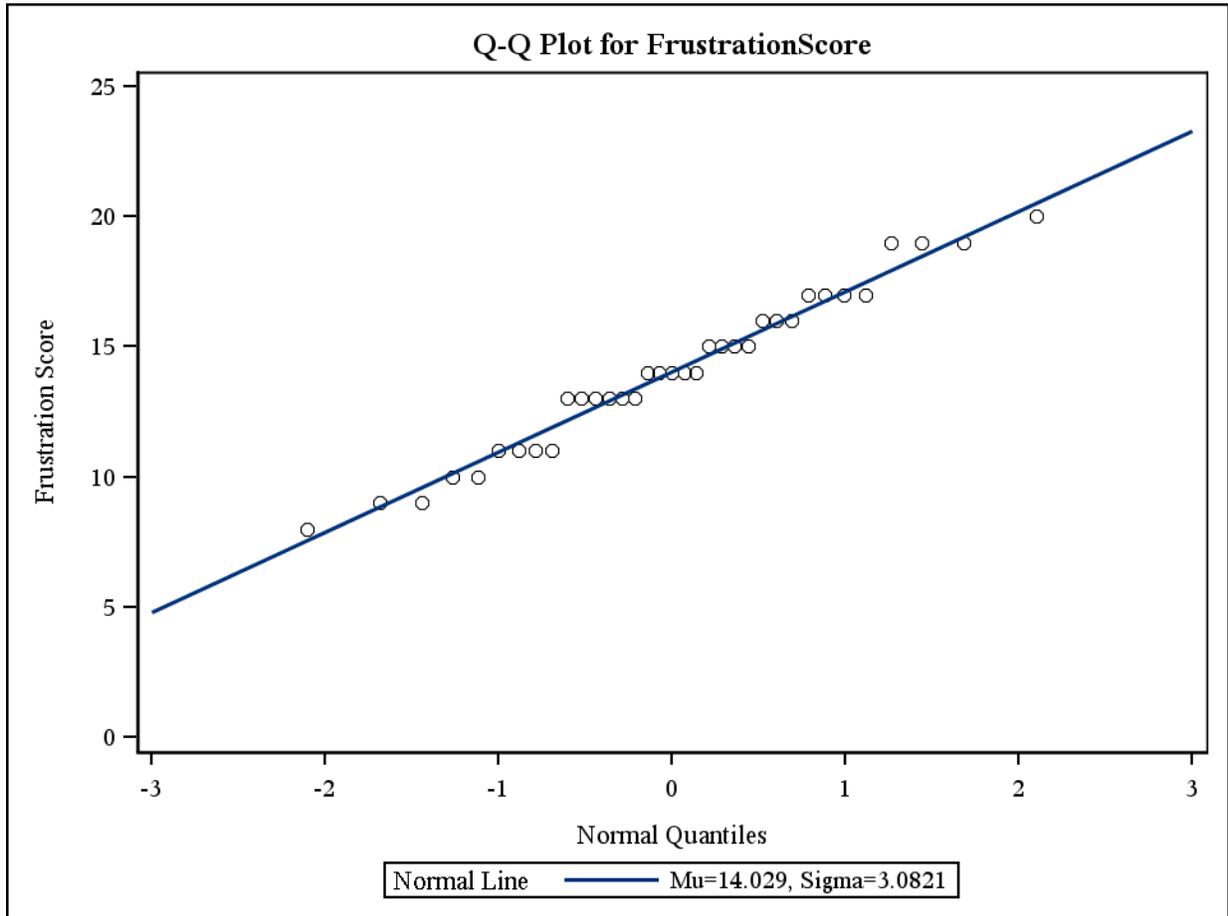### Variable: FrustrationScore (Frustration Score)

Major=Psychology

Basic Confidence Limits Assuming Normality		
Parameter	Estimate	95% Confidence Limits
Mean	14.02857	12.96984	15.08730
Std Deviation	3.08207	2.49300	4.03814
Variance	9.49916	6.21505	16.30654

The UNIVARIATE Procedure
Variable: FrustrationScore (Frustration Score)

QQ plots and standard 95% confidence intervals by Major

The UNIVARIATE Procedure
Variable: FrustrationScore (Frustration Score)

Major=Psychology

Kruskal Wallis Test

The NPAR1WAY Procedure

Wilcoxon Scores (Rank Sums) for Variable FrustrationScore Classified by Variable Major					
Major	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
Business	35	889.0	2467.50	206.828342	25.400000
English	35	2441.0	2467.50	206.828342	69.742857
Mathematics	35	3158.0	2467.50	206.828342	90.228571
Psychology	35	3382.0	2467.50	206.828342	96.628571
Average scores were used for ties.					

Kruskal-Wallis Test	
Chi-Square	66.7189
DF	3
Pr > Chi-Square	<.0001