

Sexist Role Attitudes in Colleges of Mixed Populations (of Males) and Not Coed

Summary

One survey of recent graduates of three types of colleges (males and females) indicates that there are differences in attitudes between males and females and between college types in terms of their attitudes toward different roles of the genders. The model explains 46% of the variation. The model and the fact there are differences are all significant at the 99% confidence level.

College Type	Male	Female	Totals	Averages
Coed with 75% or more males	50,35,37,32,46,38,36,40,38,41	38,27,34,30,22,32,26,24,31,33	690	34.5
Coed with less than 75% males	30,29,31,27,22,20,31,22,25,30	28,31,28,26,20,24,31,24,31,26	536	26.8
Not coed	45,40,32,31,26,28,39,27,37,35	40,35,32,29,24,26,36,25,25,35	657	32.8
Totals	883	1000		
Averages	29.4	33.3		

The 2-Way ANOVA model used to evaluate the data was valid when checked for considering the need for normal residuals and equality of variance.

The average “value” of the responses given indicates that men’s attitudes whether there were different life roles for men and women were slightly lower (29.4% versus 33.3% for women).

Colleges with a greater mix of the genders also had a lower average (26.8%) than 32.8% for Not Coed schools and 34.5% for schools with more than 75% males. NOTE: A separate 1-Way ANOVA statistically confirmed the difference statistically, but checking of that model failed necessary tests for model validity and that model results of that model could not be accepted.

Other independent statistical tests to indicate which factors varied were not conducted.

Introduction

“A study was undertaken to measure and compare sexist attitude of students at various types of colleges. Random samples of 10 graduates of each gender were selected from each of three types of colleges. A questionnaire was then administered to each student, from which a score for "degree of sexism" defined as the extent to which a student considered males and females to have different life roles was determined (the higher the score, the more sexist the attitude). The resulting data are given in the following table (and in "college.xls").” – Van Dorp assigned problem.

Analysis of Variance (ANOVA) is used to examine the data and see if attitudes about the roles of genders varies between college type, genders and/or the interaction between them.

College Type	Male	Female
Coed with 75% or more males	50,35,37,32,46,38,36,40,38,41	38,27,34,30,22,32,26,24,31,33
Coed with less than 75% males	30,29,31,27,22,20,31,22,25,30	28,31,28,26,20,24,31,24,31,26
Not coed	45,40,32,31,26,28,39,27,37,35	40,35,32,29,24,26,36,25,25,35

Data Source, Sample and Method

Data Provided

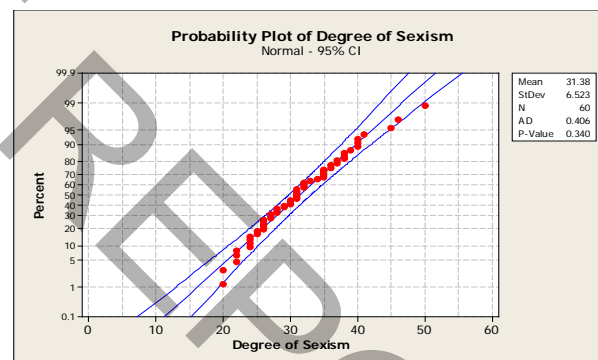
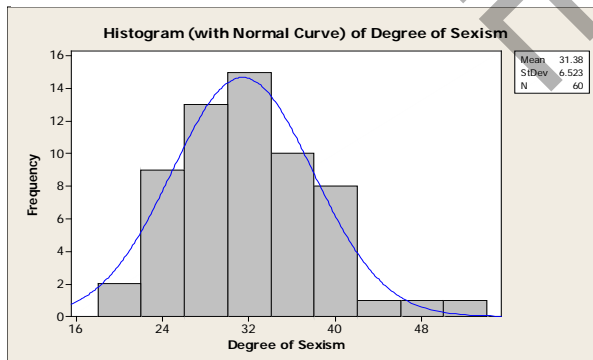
Sixty (survey) observations were provided (half male and half female), for three types of colleges (Coed with 75% or more males, Coed with less than 75% makes and Not coed). It might have been interesting to see if there were differences between male and female schools but data was not provided. Neither is there an indication of how many different colleges participated in the study.

Descriptive Statistics

Attitude on Degree of Sexism ranges from 20 to 50 (on an author's presumed scale of 0-100). Interestingly, the Mean and the Median are close to 30 - at the lower end of the range. While the maximum is 50 and the overall data is skewed slightly to the right, the data collected appears to fit a normal distribution.

Descriptive Statistics: Degree of Sexism

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Median	Maximum
Degree of Sexism	60	0	31.383	0.842	6.523	20.000	31.000	50.000

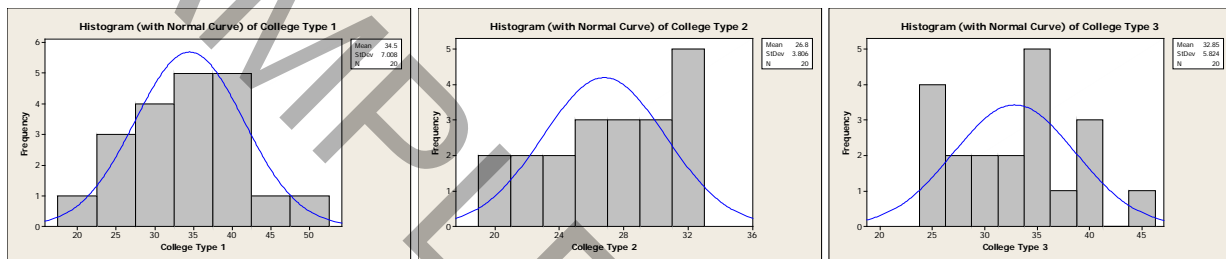


Colleges with the most males, followed by Not Coed colleges have the highest means and medians for degree of sexism. The maximum value was in a college with more than 75% males and the minimum in a college with less than 75% males.

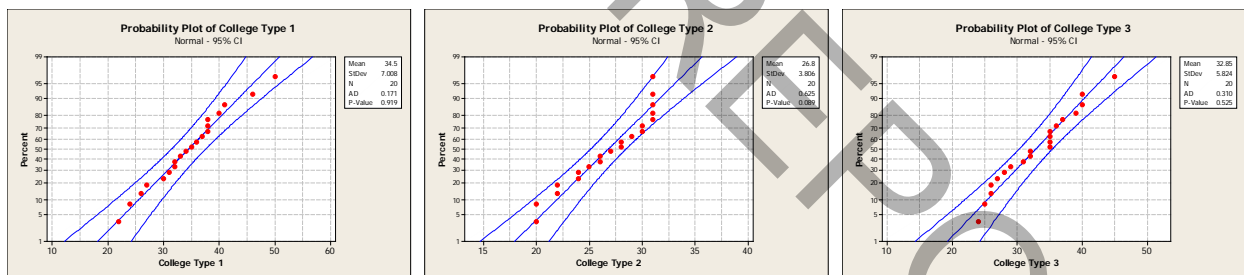
Colleges with more than 75% males have the data skewed to the left, colleges with less than 75% males have it skewed to the right and in Not Coed colleges the data is most balanced. [While not pertinent to the analysis, it would also be interesting to know the year the data was collected.]

Descriptive Statistics: College Type 1, College Type 2, College Type 3

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Median	Maximum
College Type 1	20	0	34.50	1.57	7.01	22.00	34.50	50.00
College Type 2	20	0	26.800	0.851	3.806	20.000	27.500	31.000
College Type 3	20	0	32.85	1.30	5.82	24.00	33.50	45.00



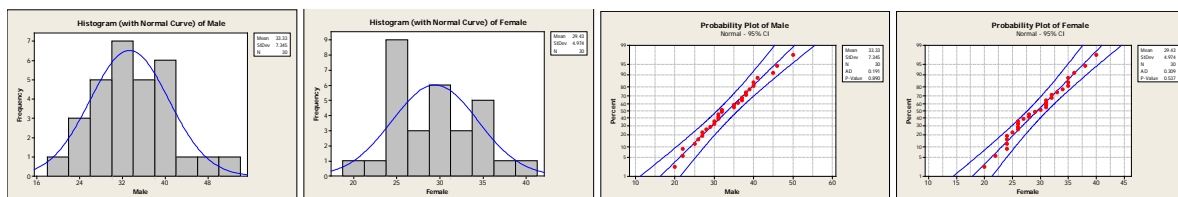
While the data points for each of the 3 colleges all fall within the 95% confidence intervals, College Type 2, less than 75% males fails the test for a normal distribution at the 90% confidence level (p-value = .089).



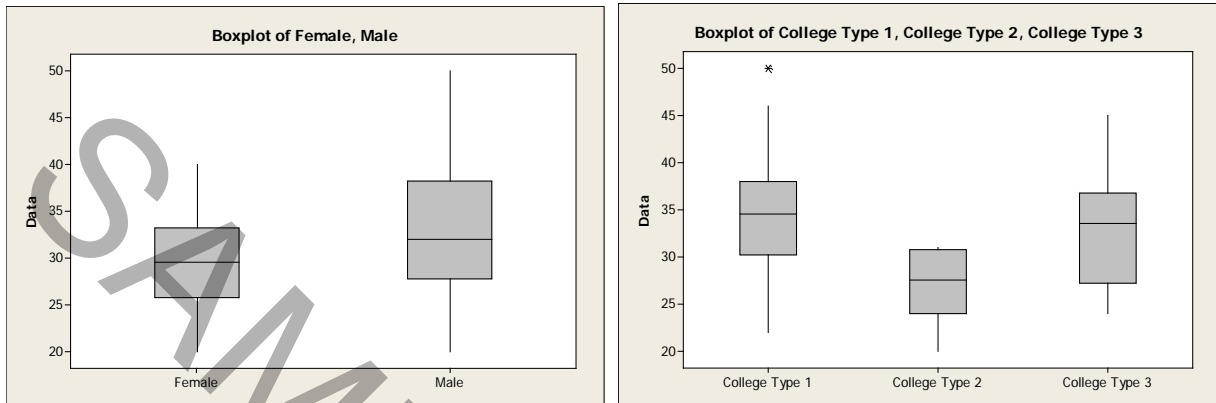
Both males and females have a minimum value of 20 while the male's maximum hits the sample maximum of 50. The male responses have a greater range. Both distributions are normal.

Descriptive Statistics: Female, Male

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Median	Maximum
Female	30	0	29.433	0.908	4.974	20.000	29.500	40.000
Male	30	0	33.33	1.34	7.35	20.00	32.00	50.00



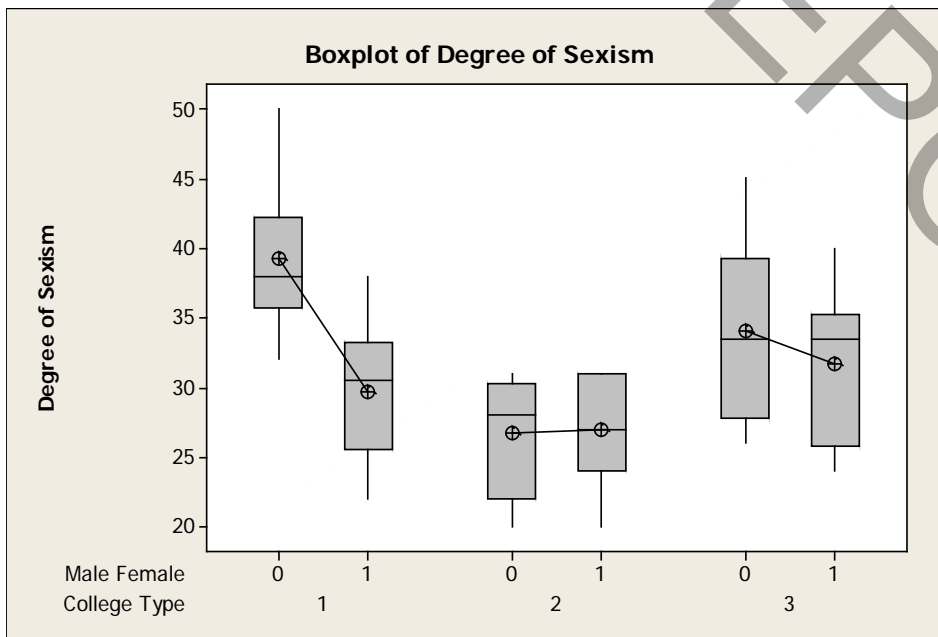
Boxplots of colleges and genders show overlap between the scores at all three colleges and between the genders.



While the box plots do not show non-overlapping confidence intervals, average responses for both college types and gender are different.

College Type	Male	Female	Totals	Averages
Coed with 75% or more males	50,35,37,32,46,38,36,40,38,41	38,27,34,30,22,32,26,24,31,33	690	34.5
Coed with less than 75% males	30,29,31,27,22,20,31,22,25,30	28,31,28,26,20,24,31,24,31,26	536	26.8
Not coed	45,40,32,31,26,28,39,27,37,35	40,35,32,29,24,26,36,25,25,35	657	32.8
Totals	883	1000		
Averages	29.4	33.3		

A box plot of the combined factors shows no single graphic is without overlap; although, there are non-overlap between some of the individual plots.



Questions of Interest

1. Is there a difference in attitudes between types of colleges?
2. Is there a difference in attitudes between the genders?
3. Is there an interaction effect between the schools and the gender?
4. Is there a difference in attitudes between schools with a high population of males and Not Coed schools and those that have a higher mix of both genders (colleges with less than 75% males)?

Hypothesis Tests

1. Ho: parameters unique to colleges (Factor A) are all and equal 0; H1: at least one is not equal to 0
2. Ho: parameters unique to gender (Factor B) are all equal and equal 0; H1: at least one is not equal to 0.
3. Ho: the interaction of the parameters = 0 for all combinations; at least one interaction is not equal to 0.
4. Ho: Schools with a greater mix of genders and schools with more males or not coed have parameters that equal 0; H1: there is at least one difference.

Note: Hypotheses 1-3 were tested using 2-Way ANOVA. Hypothesis 4 was tested separately using a 1-Way ANOVA (stacked) approach.

Data Analysis**Data Analysis for H1-H3**

While the box plots do not show a lot of separation, a 2-Way Analysis of Variance (unstacked) shows that 46% of the variation in attitudes for degree of sexism is explained by the data.

P-values for Hypothesis 1, 2 and 3 are all low and the analysis indicates that College Type, Gender and the interaction between them are all significant at the 99% confidence level.

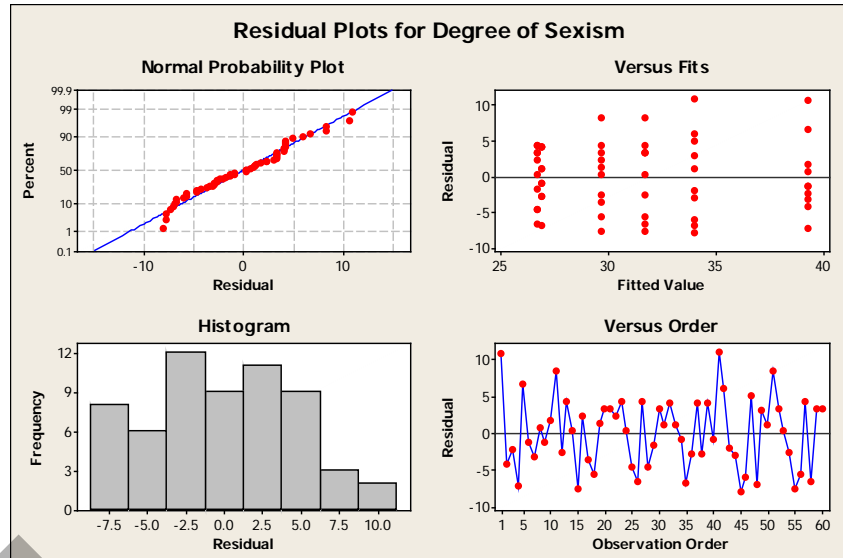
Two-way ANOVA: Degree of Sexism versus College Type, Male Female

Source	DF	SS	MS	F	P
College Type	2	657.43	328.717	13.00	0.000
Male Female	1	228.15	228.150	9.02	0.004
Interaction	2	259.30	129.650	5.13	0.009
Error	54	1365.30	25.283		
Total	59	2510.18			

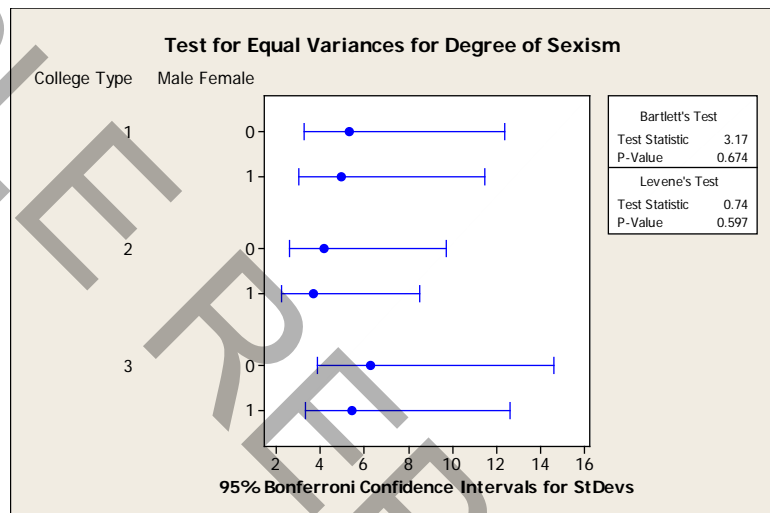
S = 5.028 R-Sq = 45.61% R-Sq(adj) = 40.57%

Analysis of residuals (to right) indicates that the residuals are normally distributed so the assumptions underlying the regression approach/model are valid from that perspective.

A Minitab normality probability plot is not provided because the standard error of the model is not presented.



Neither Bartlett's and Levene's Tests for equal variance have p-values indicating that variance are not equal; so, the model meets this criteria as well.



Data Analysis for H4

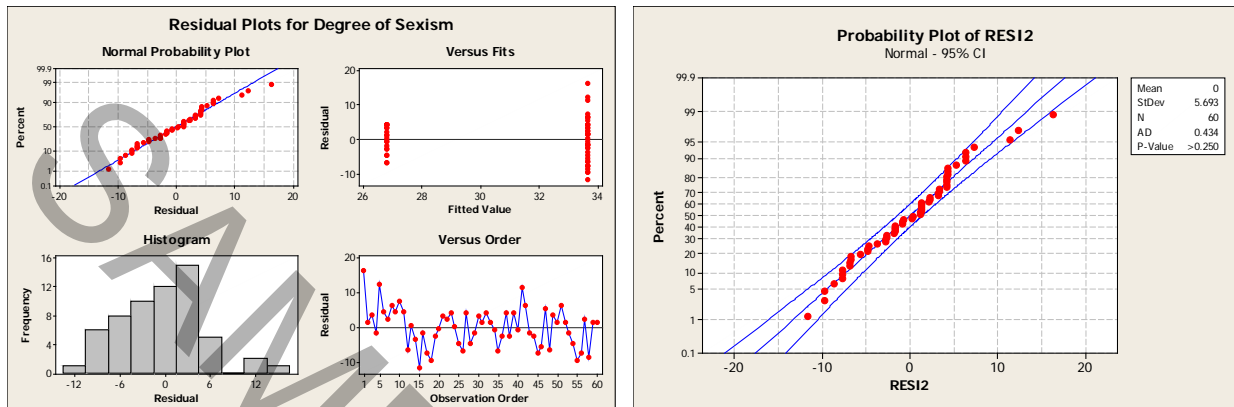
P-values for Hypothesis 4 are low and indicate there is a difference between the attitudes at schools with a higher degree of differences in attendance by the genders.

One-way ANOVA: Degree of Sexism versus College Type for H4

Source	DF	SS	MS	F	P
College Type for H4	1	630.2	630.2	19.44	0.000
Error	58	1880.0	32.4		
Total	59	2510.2			

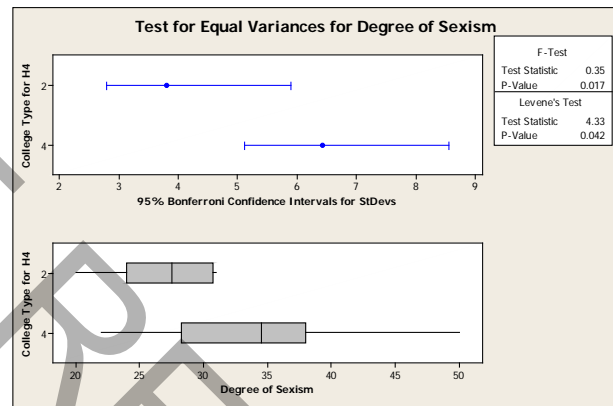
S = 5.693 R-Sq = 25.11% R-Sq(adj) = 23.81%

Analysis of residuals does not indicate this model should be rejected. Normality of the residuals can be assumed because a hypothesis that they are not normal cannot be rejected (p-value greater than .25). The probability plots shows that there is one outlier.



However, Bartlett’s and Levene’s tests for equal variance are rejected.

So, the model does not meet required underlying assumptions and H4 cannot be evaluated this way.



Conclusion

One survey of recent graduates of three types of colleges (males and females) indicate that there are differences in attitudes between males and females and between college types. The model explains 46% of the variation. The model and the fact there are differences are all significant at the 99% confidence level.

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