performed by Inna Williams.

##

1. What goal did all students choose most often as their most important personal goal? Which goal was chosen least often?

```
proc import datafile='/folders/myfolders/data/week5/popularkids.csv'
      out=pk dbms=csv replace;
      delimiter=',';
      getnames=yes;
run;
options nodate ps=60 ls=80;

proc freq data=pk ;
title " What goal did all students choose most often as their most
important personal goal";
tables Goals /nocum nopercent;
Run;
```

What goal did all students choose most often as their most important personal goal

The FREQ Procedure

Goals	Frequency
Grades	247
Popular	141
Sports	90

Interpretation:
The most often the students choose Grades = 247 as their most important personal goal
The least often students choose Sports = 90 as their least important
personal goal

##

2. Does the personal goal that is chosen most often differ by gender? By grade? By age? By race? By the UrbanRural variable? By school?
Use chi-square tests to answer these questions.

```
data Personal_GOAL_Grades;
set pk;
if Goals eq 'Grades' then Group_grade="1_Chosen_More_Often";
if Goals eq 'Popular' or Goals eq 'Sports' then Group_grade
="2_Chosen_Less_Often";

proc freq data=Personal_GOAL_Grades;
title "personal goal that is chosen most often differ by gender  race
";
tables (Gender Race)*Group_grade /chisq cmh;
Run;

proc freq data=Personal_GOAL_Grades;
title "personal goal that is chosen most often differ by  grade age
UrbalRural School";
tables Group_grade*(Grade   Age  UrbanRural School) /chisq trend;
Run;
```

Group Gender

personal goal that is chosen most often differ by gender race

The FREQ Procedure

Frequency Percent Row Pct Col Pct	Table of Gender by Group_grade		
	Group_grade		
Gender	1_Chosen_More_Often	2_Chosen_All_Others	Total
boy	117 24.48 51.54 47.37	110 23.01 48.46 47.62	227 47.49
girl	130 27.20 51.79 52.63	121 25.31 48.21 52.38	251 52.51
Total	247 51.67	231 48.33	478 100.00

Statistics for Table of Gender by Group_grade

Statistic	DF	Value	Prob
Chi-Square	1	0.0030	0.9563
Likelihood Ratio Chi-Square	1	0.0030	0.9563
Continuity Adj. Chi-Square	1	0.0000	1.0000
Mantel-Haenszel Chi-Square	1	0.0030	0.9563
Phi Coefficient		-0.0025	
Contingency Coefficient		0.0025	
Cramer's V		-0.0025	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	117
Left-sided Pr <= F	0.5147
Right-sided Pr >= F	0.5582
Table Probability (P)	0.0729
Two-sided Pr <= P	1.0000

Sample Size = 478

Summary Statistics for Gender by Group_grade

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.0030	0.9563
2	Row Mean Scores Differ	1	0.0030	0.9563
3	General Association	1	0.0030	0.9563

Common Odds Ratio and Relative Risks				
Statistic	Method	Value	95% Confidence Limits	
Odds Ratio	Mantel-Haenszel	0.9900	0.6912	1.4179
	Logit	0.9900	0.6912	1.4179
Relative Risk (Column 1)	Mantel-Haenszel	0.9952	0.8365	1.1839
	Logit	0.9952	0.8365	1.1839
Relative Risk (Column 2)	Mantel-Haenszel	1.0052	0.8349	1.2102
	Logit	1.0052	0.8349	1.2102

Total Sample Size = 478

Interpretation of Group Gender
Sample size =478
Ho - Choosing the personal goal by students that is chosen more often differ By gender.
Ha - Choosing the personal goal by students that is chosen more often does not differ By gender.

Test results are:

Chi-Square	**1**	**0.0030**	**0.9563**

P-value =0.9563 > alpha=0.05
Relative Risk (Column 1) value = 1.9952 with 95% CI = [0.8365,1.1839]
Because CI contain 1.0 and p-value > 0.05 we fail to reject Ho. There is not enough Evidence to conclude that choosing the personal goal by students that is chosen more often differ by gender.

Group Race

Frequency Percent Row Pct Col Pct

Table of Race by Group_grade			
	Group_grade		
Race	1_Chosen_More_Often	2_Chosen_All_Others	Total
Other	22 4.60 61.11 8.91	14 2.93 38.89 6.06	36 7.53
White	225 47.07 50.90 91.09	217 45.40 49.10 93.94	442 92.47
Total	247 51.67	231 48.33	478 100.00

Statistics for Table of Race by Group_grade

Statistic	DF	Value	Prob
Chi-Square	1	1.3886	0.2386
Likelihood Ratio Chi-Square	1	1.4018	0.2364
Continuity Adj. Chi-Square	1	1.0099	0.3149
Mantel-Haenszel Chi-Square	1	1.3857	0.2391
Phi Coefficient		0.0539	
Contingency Coefficient		0.0538	
Cramer's V		0.0539	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	22
Left-sided Pr <= F	0.9123
Right-sided Pr >= F	0.1575
Table Probability (P)	0.0698
Two-sided Pr <= P	0.2984

Sample Size = 478

Summary Statistics for Race by Group_grade

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	1.3857	0.2391
2	Row Mean Scores Differ	1	1.3857	0.2391
3	General Association	1	1.3857	0.2391

Common Odds Ratio and Relative Risks				
Statistic	Method	Value	95% Confidence Limits	
Odds Ratio	Mantel-Haenszel	1.5156	0.7560	3.0384
	Logit	1.5156	0.7560	3.0384
Relative Risk (Column 1)	Mantel-Haenszel	1.2005	0.9108	1.5824
	Logit	1.2005	0.9108	1.5824
Relative Risk (Column 2)	Mantel-Haenszel	0.7921	0.5203	1.2060
	Logit	0.7921	0.5203	1.2060

Total Sample Size = 478

Interpretation of Group Race

Chi-Square	**1**	**1.3886**	**0.2386**

Sample size =478
Ho - Choosing the personal goal by students that is chosen more often differ By race.
Ha - Choosing the personal goal by students that is chosen more often does not differ By race.

P-value =0.2386 > alpha=0.05
Relative Risk (Column 1) value = 1.2005 with 95% CI = [0.9108,1.5824]
Because CI contain 1.0 and p-value > 0.05 we fail to reject Ho. There is not enough Evidence to conclude that choosing the personal goal by students that is chosen more often differ by race.

Group Grade (4,5,6)

personal goal that is chosen most often differ by grade age UrbalRural School

The FREQ Procedure

Frequency
Percent
Row Pct
Col Pct

Table of Group_grade by Grade

Group_grade	Grade 4	5	6	Total
1_Chosen_More_Often	63 13.18 25.51 52.94	88 18.41 35.63 50.00	96 20.08 38.87 52.46	247 51.67
2_Chosen_All_Others	56 11.72 24.24 47.06	88 18.41 38.10 50.00	87 18.20 37.66 47.54	231 48.33
Total	119 24.90	176 36.82	183 38.28	478 100.00

Statistics for Table of Group_grade by Grade

Statistic	DF	Value	Prob
Chi-Square	2	0.3192	0.8525
Likelihood Ratio Chi-Square	2	0.3191	0.8525
Mantel-Haenszel Chi-Square	1	0.0001	0.9934
Phi Coefficient		0.0258	
Contingency Coefficient		0.0258	
Cramer's V		0.0258	

Cochran-Armitage Trend Test	
Statistic (Z)	-0.0083
One-sided Pr < Z	0.4967
Two-sided Pr > |Z|	0.9934

Sample Size = 478

Interpretation of Group Grade 4,5,6
Sample size =478
Ho - Choosing the personal goal by students that is chosen more often differ By Grade.

Ha - Choosing the personal goal by students that is chosen more often does not differ By grade.

Mantel-Haenszel Statistic Chi-Square = 0.0001:
P-value =0.9934 > alpha=0.05
Because p-value > 0.05 we fail to reject Ho. There is not enough
Evidence to conclude that choosing the personal goal by students that is chosen more often differ by grade .

Group by Age

Frequency
Percent
Row Pct
Col Pct

Table of Group_grade by Age

Group_grade	Age 7	9	10	11	12	13	Total
1_Chosen_More_Often	1 0.21 0.40 100.00	50 10.46 20.24 50.00	72 15.06 29.15 54.55	94 19.67 38.06 49.74	29 6.07 11.74 55.77	1 0.21 0.40 25.00	247 51.67
2_Chosen_All_Others	0 0.00 0.00 0.00	50 10.46 21.65 50.00	60 12.55 25.97 45.45	95 19.87 41.13 50.26	23 4.81 9.96 44.23	3 0.63 1.30 75.00	231 48.33
Total	1 0.21	100 20.92	132 27.62	189 39.54	52 10.88	4 0.84	478 100.00

Statistics for Table of Group_grade by Age

Statistic	DF	Value	Prob
Chi-Square	5	3.2566	0.6605
Likelihood Ratio Chi-Square	5	3.6887	0.5950
Mantel-Haenszel Chi-Square	1	0.0496	0.8238
Phi Coefficient		0.0825	
Contingency Coefficient		0.0823	
Cramer's V		0.0825	
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.			

Cochran-Armitage Trend Test	
Statistic (Z)	-0.2229
One-sided Pr < Z	0.4118
Two-sided Pr > |Z|	0.8236

Sample Size = 478

Interpretation of Group Age
Sample size =478

Ho - Choosing the personal goal by students that is chosen more often differ By Age.
Ha - Choosing the personal goal by students that is chosen more often does not differ By Age.

Mantel-Haenszel Statistic Chi-Square = 0.0496:
P-value =0.8238 > alpha=0.05
Because p-value > 0.05 we fail to reject Ho. There is not enough
Evidence to conclude that choosing the personal goal by students that is chosenmore often differ by grade .

Group by UrbanRural

Sample Size = 478

Frequency
Percent
Row Pct
Col Pct

Table of Group_grade by UrbanRural

Group_grade	UrbanRural			
	Rural	Subur	Urban	Total
1_Chosen_More_Often	57 11.92 23.08 38.26	87 18.20 35.22 57.62	103 21.55 41.70 57.87	247 51.67
2_Chosen_All_Others	92 19.25 39.83 61.74	64 13.39 27.71 42.38	75 15.69 32.47 42.13	231 48.33
Total	149 31.17	151 31.59	178 37.24	478 100.00

Statistics for Table of Group_grade by UrbanRural

Statistic	DF	Value	Prob
Chi-Square	2	15.6112	0.0004
Likelihood Ratio Chi-Square	2	15.7030	0.0004
Mantel-Haenszel Chi-Square	1	11.8186	0.0006
Phi Coefficient		0.1807	
Contingency Coefficient		0.1778	
Cramer's V		0.1807	

Cochran-Armitage Trend Test	
Statistic (Z)	3.4414
One-sided Pr > Z	0.0003
Two-sided Pr > |Z|	0.0006

Sample Size = 478

Interpretation of Group UrbalRural

Sample size =478

Ho - Choosing the personal goal by students that is chosen more often differ By UrbanRural.

Ha - Choosing the personal goal by students that is chosen more often does not differ By UrbanRural.

Mantel-Haenszel Chi-Square	1	11.8186	0.0006

Mantel-Haenszel Statistic Chi-Square = 11.8186:

P-value =0.0006 < alpha=0.05

Because p-value < 0.05 we reject Ho.

We can conclude that choosing the personal goal by students that is chosen more often significantly differ by UrbalRural .

Group by School

Frequency
Percent
Row Pct
Col Pct

Table of Group_grade by School

Group_grade	School								
	Bre	Bro	Elm	Mai	Por	Rid	San	Wes	Total
1_Chosen_More_Often	87 18.20 35.22 57.62	22 4.60 8.91 42.31	4 0.84 1.62 19.05	45 9.41 18.22 66.18	30 6.28 12.15 49.18	16 3.35 6.48 33.33	15 3.14 6.07 53.57	28 5.86 11.34 57.14	247 51.67
2_Chosen_All_Others	64 13.39 27.71 42.38	30 6.28 12.99 57.69	17 3.56 7.36 80.95	23 4.81 9.96 33.82	31 6.49 13.42 50.82	32 6.69 13.85 66.67	13 2.72 5.63 46.43	21 4.39 9.09 42.86	231 48.33
Total	151 31.59	52 10.88	21 4.39	68 14.23	61 12.76	48 10.04	28 5.86	49 10.25	478 100.00

Statistics for Table of Group_grade by School

Statistic	DF	Value	Prob
Chi-Square	7	25.8854	0.0005
Likelihood Ratio Chi-Square	7	26.7257	0.0004
Mantel-Haenszel Chi-Square	1	0.4140	0.5199
Phi Coefficient		0.2327	
Contingency Coefficient		0.2267	
Cramer's V		0.2327	

Cochran-Armitage Trend Test	
Statistic (Z)	-0.6441
One-sided Pr < Z	0.2597
Two-sided Pr > |Z|	0.5195

Sample Size = 478

Interpretation of Group School
Sample size =478
Ho - Choosing the personal goal by students that is chosen more often differ By School.
Ha - Choosing the personal goal by students that is chosen more often does not differ By School.

Mantel-Haenszel Statistic Chi-Square = 0.04140:
P-value =0.5199 > alpha=0.05
Because p-value > 0.05 we fail to reject Ho. There is not enough
Evidence to conclude that choosing the personal goal by students that is chosen more often differ by school .

##

3. In making a person popular, were grades ranked similarly for boys and girls?
4. In making a person popular, were looks ranked similarly for boys and girls?
5. In making a person popular, was money ranked similarly for boys and

```
proc freq data=pk;
title "Gender Opinion On Popularity";
tables  Gender*(Grades Looks Money)/chisq expected cmh trend;
run;

proc sgpanel data=pk ;
panelby GENDER / layout=COLUMNLATTICE;
histogram Money;
run;

proc sgpanel data=pk ;
panelby GENDER / layout=COLUMNLATTICE;
histogram Looks;
run;

proc sgpanel data=pk ;
panelby GENDER / layout=COLUMNLATTICE;
histogram Grades;
run;
```

```
proc sort data=pk;
by Gender;
```

In making a person popular, were grades ranked similarly for boys and girls?

Gender Opnion On Popularity

The FREQ Procedure

Frequency
Expected
Percent
Row Pct
Col Pct

Table of Gender by Grades					
	Grades				
Gender	1	2	3	4	Total
boy	39 44.64 8.16 17.18 41.49	61 58.412 12.76 26.87 49.59	67 63.161 14.02 29.52 50.38	60 60.787 12.55 26.43 46.88	227 47.49
girl	55 49.36 11.51 21.91 58.51	62 64.588 12.97 24.70 50.41	66 69.839 13.81 26.29 49.62	68 67.213 14.23 27.09 53.13	251 52.51
Total	94 19.67	123 25.73	133 27.82	128 26.78	478 100.00

Statistics for Table of Gender by Grades

Statistic	DF	Value	Prob
Chi-Square	3	2.0392	0.5643
Likelihood Ratio Chi-Square	3	2.0472	0.5627
Mantel-Haenszel Chi-Square	1	0.4491	0.5028
Phi Coefficient		0.0653	
Contingency Coefficient		0.0652	
Cramer's V		0.0653	

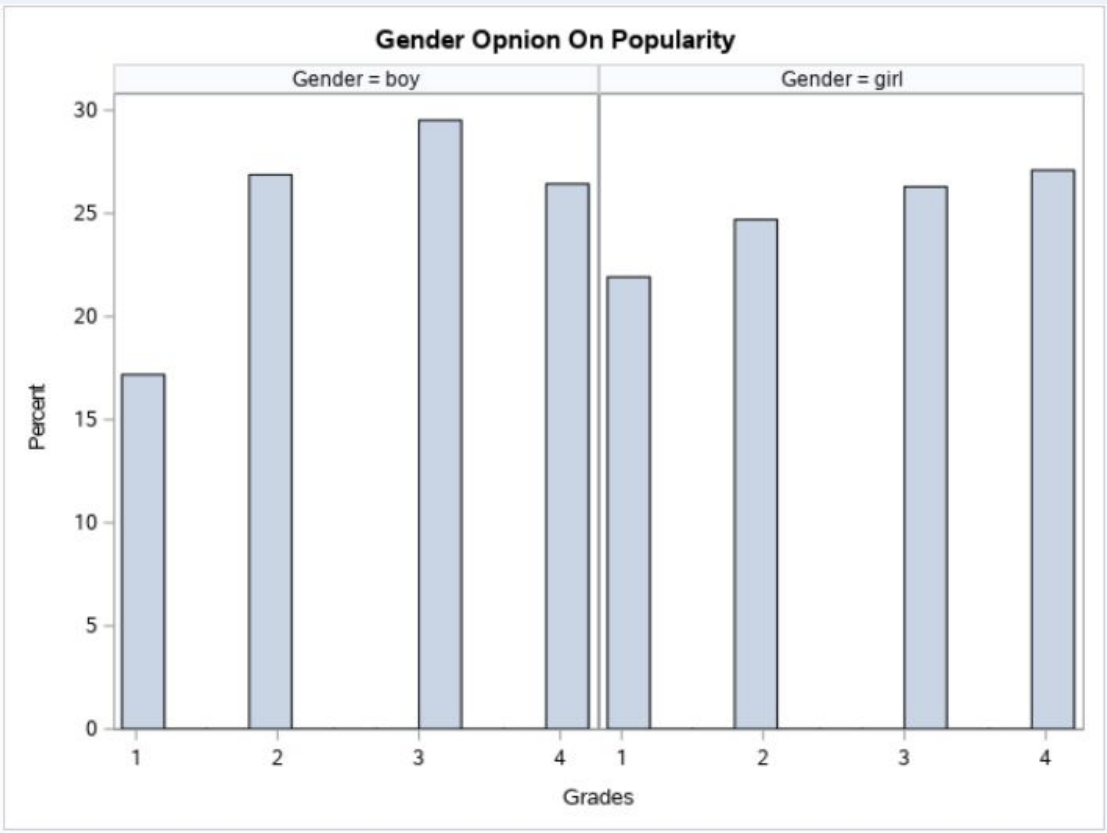
Cochran-Armitage Trend Test	
Statistic (Z)	0.6708
One-sided Pr > Z	0.2512
Two-sided Pr > |Z|	0.5023

Sample Size = 478

Summary Statistics for Gender by Grades

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.4491	0.5028
2	Row Mean Scores Differ	1	0.4491	0.5028
3	General Association	3	2.0349	0.5652

Total Sample Size = 478



Interpretation of Grades on Popularity by Gender
Sample size =478
Ho - Grades rank for popularity depends on Gender.
Ha - Grades rank for popularity does not depend on Gender

Mantel-Haenszel Chi-Square	**1**	**0.4491**	**0.5028**

Mantel-Haenszel Statistic Chi-Square = 0.04191:
P-value =0.5028 > alpha=0.05
Because p-value > 0.05 we fail to reject Ho. There is not enough
Evidence to conclude that choosing grades by students for popularity depends on Grades .

Looking on Histogram we can see there is no difference between Girls and boys ranking the money for popularity..

****

In making a person popular, were looks ranked similarly for boys and Girls?

Frequency
Expected
Percent
Row Pct
Col Pct

Table of Gender by Looks

Gender	Looks 1	2	3	4	Total
boy	44 87.856 9.21 19.38 23.78	74 59.837 15.48 32.60 58.73	59 47.964 12.34 25.99 58.42	50 31.343 10.46 22.03 75.76	227 47.49
girl	141 97.144 29.50 56.18 76.22	52 66.163 10.88 20.72 41.27	42 53.036 8.79 16.73 41.58	16 34.657 3.35 6.37 24.24	251 52.51
Total	185 38.70	126 26.36	101 21.13	66 13.81	478 100.00

Statistics for Table of Gender by Looks

Statistic	DF	Value	Prob
Chi-Square	3	74.0589	<.0001
Likelihood Ratio Chi-Square	3	77.4085	<.0001
Mantel-Haenszel Chi-Square	1	62.4045	<.0001
Phi Coefficient		0.3936	
Contingency Coefficient		0.3663	
Cramer's V		0.3936	

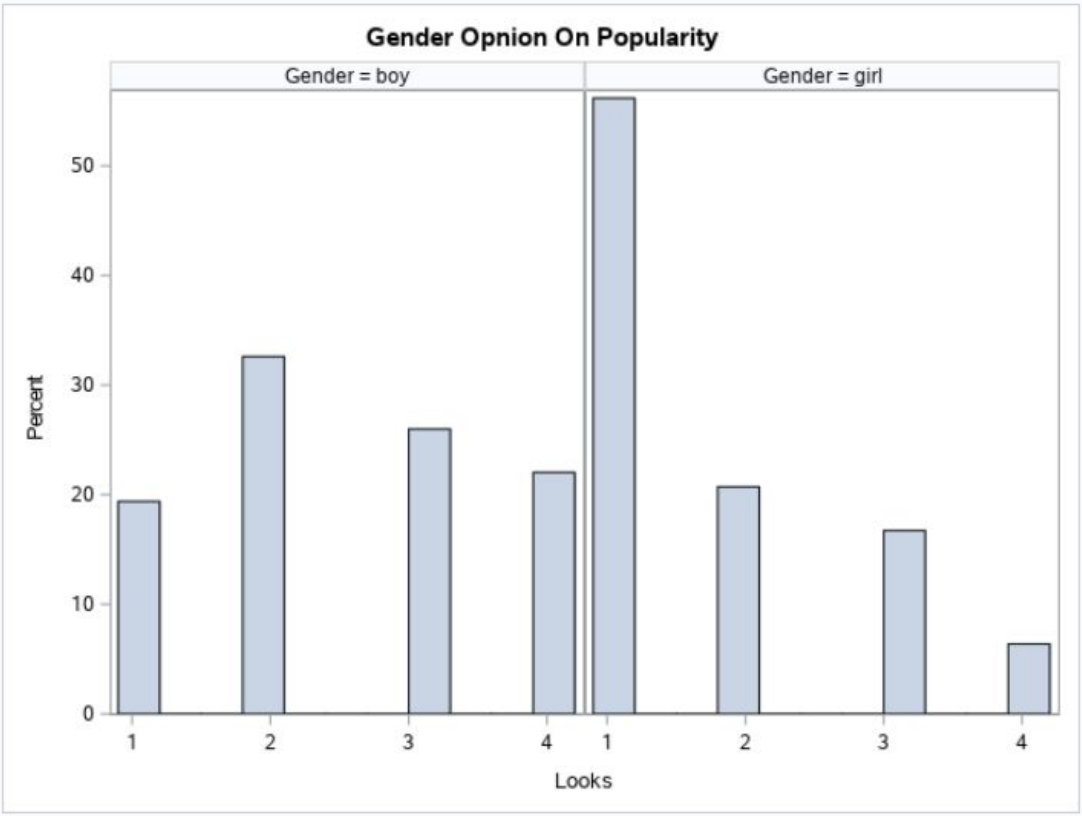
Cochran-Armitage Trend Test	
Statistic (Z)	7.9079
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001

Sample Size = 478

Summary Statistics for Gender by Looks

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	62.4045	<.0001
2	Row Mean Scores Differ	1	62.4045	<.0001
3	General Association	3	73.9040	<.0001

Total Sample Size = 478



Interpretation of Looks on Popularity by Gender
Sample size =478
Ho - Looks rank for popularity depends on Gender.
Ha - Looks rank for popularity does not depend on Gender

Mantel-Haenszel Statistic Chi-Square = 62.4045:
P-value =0.0001 < alpha=0.05

Because p-value < 0.05 we reject Ho.
We can conclude that Looks rank by students for popularity significantly depends on Gender.

From the histogram we also can see that the girls rank looks as number one much greater than the boys.

****

In making a person popular, was money ranked similarly for boys and

Frequency Expected Percent Row Pct Col Pct

Table of Gender by Money

Gender	Money 1	2	3	4	Total
boy	17 16.146 3.56 7.49 50.00	32 35.617 6.69 14.10 42.67	70 62.686 14.64 30.84 53.03	108 112.55 22.59 47.58 45.57	227 47.49
girl	17 17.854 3.56 6.77 50.00	43 39.383 9.00 17.13 57.33	62 69.314 12.97 24.70 46.97	129 124.45 26.99 51.39 54.43	251 52.51
Total	34 7.11	75 15.69	132 27.62	237 49.58	478 100.00

Statistics for Table of Gender by Money

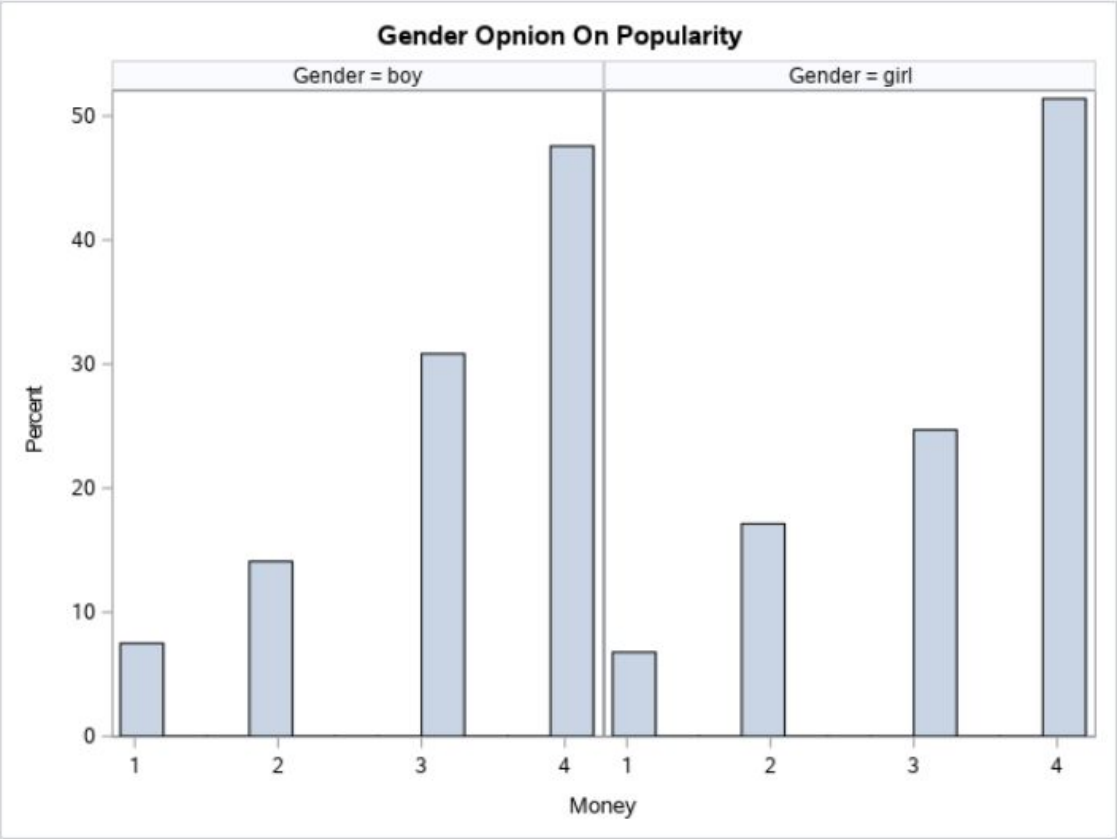
Statistic	DF	Value	Prob
Chi-Square	3	2.7609	0.4300
Likelihood Ratio Chi-Square	3	2.7620	0.4298
Mantel-Haenszel Chi-Square	1	0.0649	0.7988
Phi Coefficient		0.0760	
Contingency Coefficient		0.0758	
Cramer's V		0.0760	

Cochran-Armitage Trend Test	
Statistic (Z)	-0.2551
One-sided Pr < Z	0.3993
Two-sided Pr > |Z|	0.7986

Sample Size = 478

Summary Statistics for Gender by Money

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.0649	0.7988
2	Row Mean Scores Differ	1	0.0649	0.7988
3	General Association	3	2.7551	0.4309



Interpretation of Money on Popularity by Gender
Sample size =478
Ho - Money rank for popularity depends on Gender.
Ha - Money rank for popularity does not depend on Gender

Mantel-Haenszel Statistic Chi-Square = 0.0649:
P-value =0.7988 > alpha=0.05
Because p-value > 0.05 we fail to reject Ho. There is not enough
Evidence to conclude that choosing money by students for popularity depends on Gender .
Looking on Histogram we can see there is no difference between Girls and boys.

From Histogram we also can see that there is not much difference in ranking the money by gender.