

In several presidential elections, researchers have observed a "gender gap" in which men and women vote for candidates in different proportions. Test this hypothesis by calculating χ^2 and Yule's Q for these frequencies from the 1998 General Social Survey:

Vote by Gender

Did you vote for Clinton or Dole?

Gender

	Men	Women
Clinton	351	572
Dole	283	306

# of columns	2		
# of rows	2		
Significance level	0.05		
Observed result			
	Male	Female	Total
Clinton	351	572	923
Dole	283	306	589
Category 3			0
Total	634	878	1512
Expected value			
	Male	Female	Total
Clinton	387.0	536.0	923
Dole	247.0	342.0	589
Total	634	878	1512
Observed result - Expected value			
	Male	Female	
Clinton	-36.0	36.0	
Dole	36.0	-36.0	
Category 3	0.0	0.0	
(Observed result - Expected value)²			
	Male	Female	
Clinton	1297.81	1297.81	
Dole	1297.81	1297.81	
(Observed result - Expected value)² / Expected value			
	Male	Female	Total
Clinton	3.35	2.42	5.8
Dole	5.25	3.79	9.0

14.8

*H*₀: Independence

χ^2

*H*_a: Dependence

$$df = 1$$

$$\chi^2 = 14.8$$

$$P\text{-value} = 0.00012 < 0.05$$

Therefore, **H₀ can be rejected and there is relationship.**