STAT 232 Categorical Data Analysis

(1) The following table, from the 2000 General Social Survey, cross classifies gender and political party identification. Subjects indicated whether they identified more strongly with the Democratic or Republican party or as Independents. Test, at 5% level of significance, whether or not the gender is associated with party identification by calculating the χ^2 test statistic.

	Party Identification			
Gender	Democrat	Independent	Republican	Total
Females	762	327	468	1557
Males	484	239	477	1200
Total	1246	566	945	2757

(2) A study examined whether frequent use of digital social media during adolescence is associated with subsequent occurrence of ADHD symptoms. Researchers rated the frequency of digital social media use (high frequency or low frequency) of teens who were 15 or 16 years old at and did not show symptoms of ADHD at the start of the study. They then followed the participants for two years and recoded whether or not ADHD symptoms appeared. Test whether or not the frequency of social media use is associated with diagnosis of ADHD. Calculate both the χ^2 and G^2 test statistics.

Social Media Use	ADHD	No ADHD	Total
High Frequency	16	149	165
Low Frequency	23	472	495
Total	39	621	660

(a) Test, at 5% level of significance, whether or not the frequency of social media use is associated with diagnosis of ADHD. Calculate both the χ^2 and G^2 test statistics.

- (b) Which cell contributes the most to the test statistic? Interpret your result in terms of ADHD and social media use.
- (c) Can we conclude that higher social media use increases the likelihood of diagnosis of ADHD?