

**Host**

## Notes

|                |                |                                                                                                                                                                                                                                                             |
|----------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output Created |                | 12-JUL-2026 19:37:46                                                                                                                                                                                                                                        |
| Comments       |                |                                                                                                                                                                                                                                                             |
| Input          | Data           | D:\DATA ANALYSIS\H<br>Regression Tests and<br>Models\Regression<br>Residual<br>Analysis\SPSS_Output\sa<br>v\regression_residual_ana<br>lysis_with_diagnostics.sav                                                                                           |
|                | Active Dataset | RegressionResidualAnaly<br>sisData                                                                                                                                                                                                                          |
|                | Filter         | <none>                                                                                                                                                                                                                                                      |
|                | Weight         | <none>                                                                                                                                                                                                                                                      |
|                | Split File     | <none>                                                                                                                                                                                                                                                      |
| Syntax         |                | HOST COMMAND=[cmd<br>/c if not exist "D:\DATA<br>ANALYSIS\ Chi Square<br>and Categorical Data<br>Tests\Barnards Exact<br>Test\SPSS_Output" mkdir<br>"D:\DATA ANALYSIS\ Chi<br>Square and Categorical<br>Data Tests\Barnards<br>Exact<br>Test\SPSS_Output"]. |
| Resources      | Processor Time | 00:00:00.00                                                                                                                                                                                                                                                 |
|                | Elapsed Time   | 00:00:00.13                                                                                                                                                                                                                                                 |

## Host

## Notes

| Output Created |                | 12-JUL-2026 19:37:47                                                                                                                                                                                                                      |
|----------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Comments       |                |                                                                                                                                                                                                                                           |
| Input          | Data           | D:\DATA ANALYSIS\IH Regression Tests and Models\Regression Residual Analysis\SPSS_Output\sa v\regression_residual_ana lysis_with_diagnostics.sav                                                                                          |
|                | Active Dataset | RegressionResidualAnaly sisData                                                                                                                                                                                                           |
|                | Filter         | <none>                                                                                                                                                                                                                                    |
|                | Weight         | <none>                                                                                                                                                                                                                                    |
|                | Split File     | <none>                                                                                                                                                                                                                                    |
| Syntax         |                | HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS_Output\sav" mkdir "D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS_Output\sav"']. |
| Resources      | Processor Time | 00:00:00.00                                                                                                                                                                                                                               |
|                | Elapsed Time   | 00:00:00.10                                                                                                                                                                                                                               |

## Host

|                |                |                                                                                                                                                                                                                                            |
|----------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output Created |                | 12-JUL-2026 19:37:47                                                                                                                                                                                                                       |
| Comments       |                |                                                                                                                                                                                                                                            |
| Input          | Data           | D:\DATA ANALYSIS\H Regression Tests and Models\Regression Residual Analysis\SPSS_Output\sa v\regression_residual_ana lysis_with_diagnostics.sav                                                                                            |
|                | Active Dataset | RegressionResidualAnaly sisData                                                                                                                                                                                                            |
|                | Filter         | <none>                                                                                                                                                                                                                                     |
|                | Weight         | <none>                                                                                                                                                                                                                                     |
|                | Split File     | <none>                                                                                                                                                                                                                                     |
| Syntax         |                | HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS_Output\spv" mkdir "D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS_Output\spv"'].] |
| Resources      | Processor Time | 00:00:00.02                                                                                                                                                                                                                                |
|                | Elapsed Time   | 00:00:00.08                                                                                                                                                                                                                                |

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## Notes

|                |                |                                                                                                                                                                                                                                            |
|----------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output Created |                | 12-JUL-2026 19:37:47                                                                                                                                                                                                                       |
| Comments       |                |                                                                                                                                                                                                                                            |
| Input          | Data           | D:\DATA ANALYSIS\I\H Regression Tests and Models\Regression Residual Analysis\SPSS_Output\sa v\regression_residual_analysis_with_diagnostics.sav                                                                                           |
|                | Active Dataset | RegressionResidualAnalysisData                                                                                                                                                                                                             |
|                | Filter         | <none>                                                                                                                                                                                                                                     |
|                | Weight         | <none>                                                                                                                                                                                                                                     |
|                | Split File     | <none>                                                                                                                                                                                                                                     |
| Syntax         |                | HOST COMMAND=[cmd /c if not exist "D:\DATA ANALYSIS\I\ Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS_Output\pdf" mkdir "D:\DATA ANALYSIS\I\ Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS_Output\pdf"]]. |
| Resources      | Processor Time | 00:00:00.00                                                                                                                                                                                                                                |
|                | Elapsed Time   | 00:00:00.09                                                                                                                                                                                                                                |

## Barnard's Exact Test

Barnard's Exact Test  
Import data

## Barnard Variable Preparation

Barnard Variable Preparation  
Create an independent 2 x 2 table



## Barnard Prepared Data Summary

Barnard Prepared Data Summary  
Independent group and binary outcome frequencies

## Frequencies

| Notes                  |                                |                                                                                                                           |
|------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Output Created         |                                | 12-JUL-2026 19:37:47                                                                                                      |
| Comments               |                                |                                                                                                                           |
| Input                  | Data                           | D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS_Output\sav\Barnards-Exact-Test-data.sav |
|                        | Active Dataset                 | BarnardsExactData                                                                                                         |
|                        | Filter                         | <none>                                                                                                                    |
|                        | Weight                         | <none>                                                                                                                    |
|                        | Split File                     | <none>                                                                                                                    |
|                        | N of Rows in Working Data File | 649                                                                                                                       |
| Missing Value Handling | Definition of Missing          | User-defined missing values are treated as missing.                                                                       |
|                        | Cases Used                     | Statistics are based on all cases with valid data.                                                                        |
| Syntax                 |                                | FREQUENCIES<br>VARIABLES=barnard_group barnard_outcome<br>/ORDER=ANALYSIS.                                                |
| Resources              | Processor Time                 | 00:00:00.00                                                                                                               |
|                        | Elapsed Time                   | 00:00:00.01                                                                                                               |

[BarnardsExactData] D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS\_Output\sav\Barnards-Exact-Test-data.sav

Barnard Prepared Data Summary  
Independent group and binary outcome frequencies

**Statistics**

|   |         | Independent<br>group: 0 =<br>female, 1 =<br>male | Binary<br>outcome: 0 =<br>G3 below 10, 1<br>= G3 at least 10 |
|---|---------|--------------------------------------------------|--------------------------------------------------------------|
| N | Valid   | 649                                              | 649                                                          |
|   | Missing | 0                                                | 0                                                            |

**Frequency Table**

**Independent group: 0 = female, 1 = male**

|       |        | Frequency | Percent | Valid Percent | Cumulative<br>Percent |
|-------|--------|-----------|---------|---------------|-----------------------|
| Valid | Female | 383       | 59.0    | 59.0          | 59.0                  |
|       | Male   | 266       | 41.0    | 41.0          | 100.0                 |
|       | Total  | 649       | 100.0   | 100.0         |                       |

**Binary outcome: 0 = G3 below 10, 1 = G3 at least 10**

|       |                | Frequency | Percent | Valid Percent | Cumulative<br>Percent |
|-------|----------------|-----------|---------|---------------|-----------------------|
| Valid | G3 below 10    | 100       | 15.4    | 15.4          | 15.4                  |
|       | G3 at least 10 | 549       | 84.6    | 84.6          | 100.0                 |
|       | Total          | 649       | 100.0   | 100.0         |                       |

### Observed 2 x 2 Contingency Table

>Warning # 2004. Command name: SUBTITLE

>The subtitle given exceeds 60 characters in length. The first 60 characters  
>will be used.

Observed 2 x 2 Contingency Table  
Counts, row percentages , column percentages , and expected co

## Crosstabs

| Notes                  |                                |                                                                                                                                                                                                    |
|------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output Created         |                                | 12-JUL-2026 19:37:48                                                                                                                                                                               |
| Comments               |                                |                                                                                                                                                                                                    |
| Input                  | Data                           | D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS_Output\sav\Barnards-Exact-Test-data.sav                                                                          |
|                        | Active Dataset                 | BarnardsExactData                                                                                                                                                                                  |
|                        | Filter                         | <none>                                                                                                                                                                                             |
|                        | Weight                         | <none>                                                                                                                                                                                             |
|                        | Split File                     | <none>                                                                                                                                                                                             |
|                        | N of Rows in Working Data File | 649                                                                                                                                                                                                |
| Missing Value Handling | Definition of Missing          | User-defined missing values are treated as missing.                                                                                                                                                |
|                        | Cases Used                     | Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.                                                                    |
| Syntax                 |                                | CROSSTABS<br>/TABLES=barnard_group<br>BY barnard_outcome<br>/FORMAT=AVALUE<br>TABLES<br>/STATISTICS=CHISQ<br>RISK PHI<br>/CELLS=COUNT ROW<br>COLUMN EXPECTED<br>RESID SRESID<br>/COUNT ROUND CELL. |
| Resources              | Processor Time                 | 00:00:00.03                                                                                                                                                                                        |
|                        | Elapsed Time                   | 00:00:00.02                                                                                                                                                                                        |
|                        | Dimensions Requested           | 2                                                                                                                                                                                                  |
|                        | Cells Available                | 524245                                                                                                                                                                                             |

Observed 2 x 2 Contingency Table  
Counts, row percentages , column percentages , and expected co

**Case Processing Summary**

|                                                                                               | Valid |         | Cases Missing |         | Total |         |
|-----------------------------------------------------------------------------------------------|-------|---------|---------------|---------|-------|---------|
|                                                                                               | N     | Percent | N             | Percent | N     | Percent |
| Independent group: 0 = female, 1 = male * Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 | 649   | 100.0%  | 0             | 0.0%    | 649   | 100.0%  |

**Independent group: 0 = female, 1 = male \* Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 Crosstabulation**

|                                         |        |                                                              | Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 |                |
|-----------------------------------------|--------|--------------------------------------------------------------|-----------------------------------------------------|----------------|
|                                         |        |                                                              | G3 below 10                                         | G3 at least 10 |
| Independent group: 0 = female, 1 = male | Female | Count                                                        | 50                                                  | 333            |
|                                         |        | Expected Count                                               | 59.0                                                | 324.0          |
|                                         |        | % within Independent group: 0 = female, 1 = male             | 13.1%                                               | 86.9%          |
|                                         |        | % within Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 | 50.0%                                               | 60.7%          |
|                                         |        | Residual                                                     | -9.0                                                | 9.0            |
|                                         |        | Standardized Residual                                        | -1.2                                                | .5             |
|                                         | Male   | Count                                                        | 50                                                  | 216            |
|                                         |        | Expected Count                                               | 41.0                                                | 225.0          |

Observed 2 x 2 Contingency Table  
Counts, row percentages , column percentages , and expected co

**Independent group: 0 = female, 1 = male \* Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 Crosstabulation**

|                                         |        |                                                              | Total  |
|-----------------------------------------|--------|--------------------------------------------------------------|--------|
| Independent group: 0 = female, 1 = male | Female | Count                                                        | 383    |
|                                         |        | Expected Count                                               | 383.0  |
|                                         |        | % within Independent group: 0 = female, 1 = male             | 100.0% |
|                                         |        | % within Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 | 59.0%  |
|                                         |        | Residual                                                     |        |
|                                         |        | Standardized Residual                                        |        |
|                                         | Male   | Count                                                        | 266    |
|                                         |        | Expected Count                                               | 266.0  |

**Independent group: 0 = female, 1 = male \* Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 Crosstabulation**

|       |                                                              | Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 |                |
|-------|--------------------------------------------------------------|-----------------------------------------------------|----------------|
|       |                                                              | G3 below 10                                         | G3 at least 10 |
|       | % within Independent group: 0 = female, 1 = male             | 18.8%                                               | 81.2%          |
|       | % within Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 | 50.0%                                               | 39.3%          |
|       | Residual                                                     | 9.0                                                 | -9.0           |
|       | Standardized Residual                                        | 1.4                                                 | -.6            |
| Total | Count                                                        | 100                                                 | 549            |
|       | Expected Count                                               | 100.0                                               | 549.0          |
|       | % within Independent group: 0 = female, 1 = male             | 15.4%                                               | 84.6%          |
|       | % within Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 | 100.0%                                              | 100.0%         |

Observed 2 x 2 Contingency Table  
Counts, row percentages , column percentages , and expected co

**Independent group: 0 = female, 1 = male \* Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 Crosstabulation**

|       |                                                              |        |
|-------|--------------------------------------------------------------|--------|
|       |                                                              | Total  |
|       | % within Independent group: 0 = female, 1 = male             | 100.0% |
|       | % within Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 | 41.0%  |
|       | Residual                                                     |        |
|       | Standardized Residual                                        |        |
| Total | Count                                                        | 649    |
|       | Expected Count                                               | 649.0  |
|       | % within Independent group: 0 = female, 1 = male             | 100.0% |
|       | % within Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 | 100.0% |

### Chi-Square Tests

|                                    | Value              | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|--------------------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square                 | 3.971 <sup>a</sup> | 1  | .046                              |                      |                      |
| Continuity Correction <sup>b</sup> | 3.543              | 1  | .060                              |                      |                      |
| Likelihood Ratio                   | 3.918              | 1  | .048                              |                      |                      |
| Fisher's Exact Test                |                    |    |                                   | .060                 | .030                 |
| Linear-by-Linear Association       | 3.965              | 1  | .046                              |                      |                      |
| N of Valid Cases                   | 649                |    |                                   |                      |                      |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 40.99.

b. Computed only for a 2x2 table



Observed 2 x 2 Contingency Table  
Counts, row percentages , column percentages , and expected co

### Symmetric Measures

|                    |            | Value | Approximate<br>Significance |
|--------------------|------------|-------|-----------------------------|
| Nominal by Nominal | Phi        | -.078 | .046                        |
|                    | Cramer's V | .078  | .046                        |
| N of Valid Cases   |            | 649   |                             |

### Risk Estimate

|                                                                                 | Value | 95% Confidence Interval |       |
|---------------------------------------------------------------------------------|-------|-------------------------|-------|
|                                                                                 |       | Lower                   | Upper |
| Odds Ratio for Independent group: 0 = female, 1 = male (Female / Male)          | .649  | .423                    | .995  |
| For cohort Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 = G3 below 10    | .695  | .485                    | .995  |
| For cohort Binary outcome: 0 = G3 below 10, 1 = G3 at least 10 = G3 at least 10 | 1.071 | .999                    | 1.148 |
| N of Valid Cases                                                                | 649   |                         |       |

## Grouped Bar Chart

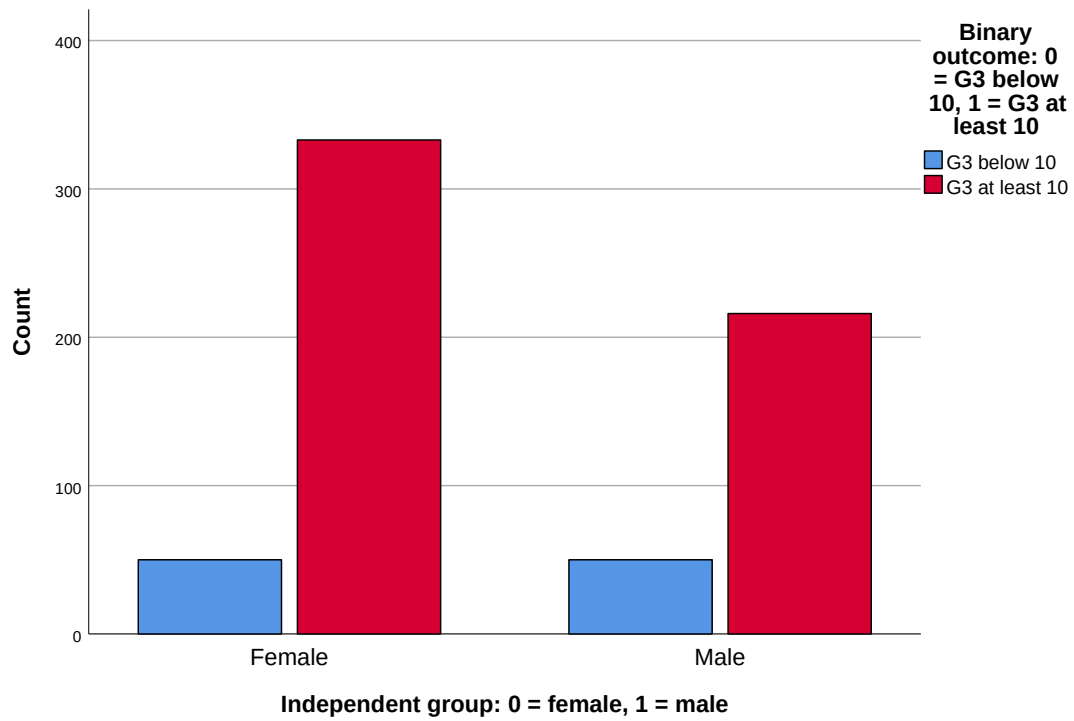
Grouped Bar Chart  
Observed binary-outcome counts by independent group

## Graph

### Notes

|                |                                |                                                                                                                          |
|----------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Output Created |                                | 12-JUL-2026 19:37:48                                                                                                     |
| Comments       |                                |                                                                                                                          |
| Input          | Data                           | D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Barnards Exact Test\SPSS_Output\sav\Barnards-Exact-Test-data.sav |
|                | Active Dataset                 | BarnardsExactData                                                                                                        |
|                | Filter                         | <none>                                                                                                                   |
|                | Weight                         | <none>                                                                                                                   |
|                | Split File                     | <none>                                                                                                                   |
|                | N of Rows in Working Data File | 649                                                                                                                      |
| Syntax         |                                | GRAPH<br>/BAR(GROUPED)<br>=COUNT BY<br>barnard_group BY<br>barnard_outcome.                                              |
| Resources      | Processor Time                 | 00:00:00.41                                                                                                              |
|                | Elapsed Time                   | 00:00:00.46                                                                                                              |

Grouped Bar Chart  
Observed binary-outcome counts by independent group



## True Barnard Unconditional Exact Test

True Barnard Unconditional Exact Test  
SPSS Python integration using scipy.stats.barnard\_exact

BARNARD EXACT PYTHON TEST COULD NOT BE COMPLETED.

Reason: No module named 'numpy'

The SPSS CROSSTABS comparison output above remains available.

Install/enable SPSS Python integration with NumPy and SciPy for the true Barnard test.

Traceback (most recent call last):

File "<string>", line 5, in <module>

ImportError: No module named 'numpy'