CROSSTABS

/TABLES=inccat BY ownpda

/FORMAT=AVALUE TABLES

/CELLS=COUNT TOTAL

/COUNT ASIS.

**Crosstabs**

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 24-OCT-2022 22:37:21 |
| Comments | |  |
| Input | Data | C:\Users\GEORGE\Desktop\Stat Consulting\demo.sav |
| Active Dataset | DataSet1 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 6400 |
| 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  /TABLES=inccat BY ownpda  /FORMAT=AVALUE TABLES  /CELLS=COUNT TOTAL  /COUNT ASIS. |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.02 |
| Dimensions Requested | 2 |
| Cells Available | 174762 |

[DataSet1] C:\Users\GEORGE\Desktop\Stat Consulting\demo.sav

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Case Processing Summary** | | | | | | |
|  | Cases | | | | | |
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| Income category in thousands \* Owns PDA | 6400 | 100.0% | 0 | 0.0% | 6400 | 100.0% |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Income category in thousands \* Owns PDA Crosstabulation** | | | | | |
|  | | | Owns PDA | | Total |
| No | Yes |
| Income category in thousands | Under $25 | Count | 983 | 191 | 1174 |
| % of Total | 15.4% | 3.0% | 18.3% |
| $25 - $49 | Count | 1933 | 455 | 2388 |
| % of Total | 30.2% | 7.1% | 37.3% |
| $50 - $74 | Count | 889 | 231 | 1120 |
| % of Total | 13.9% | 3.6% | 17.5% |
| $75+ | Count | 1288 | 430 | 1718 |
| % of Total | 20.1% | 6.7% | 26.8% |
| Total | | Count | 5093 | 1307 | 6400 |
| % of Total | 79.6% | 20.4% | 100.0% |

CROSSTABS

/TABLES=inccat BY ownpda

/FORMAT=AVALUE TABLES

/STATISTICS=CHISQ

/CELLS=COUNT TOTAL

/COUNT ASIS.

**Crosstabs**

|  |  |  |
| --- | --- | --- |
| **Notes** | | |
| Output Created | | 24-OCT-2022 23:36:30 |
| Comments | |  |
| Input | Data | C:\Users\GEORGE\Desktop\Stat Consulting\demo.sav |
| Active Dataset | DataSet1 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 6400 |
| 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  /TABLES=inccat BY ownpda BY ed  /FORMAT=AVALUE TABLES  /STATISTICS=CHISQ  /CELLS=COUNT  /COUNT ASIS. |
| Resources | Processor Time | 00:00:00.03 |
| Elapsed Time | 00:00:00.03 |
| Dimensions Requested | 3 |
| Cells Available | 142987 |

[DataSet1] C:\Users\GEORGE\Desktop\Stat Consulting\demo.sav

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Case Processing Summary** | | | | | | |
|  | Cases | | | | | |
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| Income category in thousands \* Owns PDA \* Level of education | 6400 | 100.0% | 0 | 0.0% | 6400 | 100.0% |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Income category in thousands \* Owns PDA \* Level of education Crosstabulation** | | | | | |
| Count | | | | | |
| Level of education | | | Owns PDA | | Total |
| No | Yes |
| Did not complete high school | Income category in thousands | Under $25 | 298 | 24 | 322 |
| $25 - $49 | 500 | 37 | 537 |
| $50 - $74 | 202 | 22 | 224 |
| $75+ | 272 | 35 | 307 |
| Total | | 1272 | 118 | 1390 |
| High school degree | Income category in thousands | Under $25 | 329 | 49 | 378 |
| $25 - $49 | 631 | 99 | 730 |
| $50 - $74 | 279 | 47 | 326 |
| $75+ | 418 | 84 | 502 |
| Total | | 1657 | 279 | 1936 |
| Some college | Income category in thousands | Under $25 | 195 | 46 | 241 |
| $25 - $49 | 401 | 110 | 511 |
| $50 - $74 | 191 | 57 | 248 |
| $75+ | 274 | 86 | 360 |
| Total | | 1061 | 299 | 1360 |
| College degree | Income category in thousands | Under $25 | 146 | 50 | 196 |
| $25 - $49 | 335 | 155 | 490 |
| $50 - $74 | 187 | 72 | 259 |
| $75+ | 255 | 155 | 410 |
| Total | | 923 | 432 | 1355 |
| Post-undergraduate degree | Income category in thousands | Under $25 | 15 | 22 | 37 |
| $25 - $49 | 66 | 54 | 120 |
| $50 - $74 | 30 | 33 | 63 |
| $75+ | 69 | 70 | 139 |
| Total | | 180 | 179 | 359 |
| Total | Income category in thousands | Under $25 | 983 | 191 | 1174 |
| $25 - $49 | 1933 | 455 | 2388 |
| $50 - $74 | 889 | 231 | 1120 |
| $75+ | 1288 | 430 | 1718 |
| Total | | 5093 | 1307 | 6400 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Chi-Square Tests** | | | | |
| Level of education | | Value | df | Asymp. Sig. (2-sided) |
| Did not complete high school | Pearson Chi-Square | 6.074b | 3 | .108 |
| Likelihood Ratio | 5.883 | 3 | .117 |
| Linear-by-Linear Association | 4.759 | 1 | .029 |
| N of Valid Cases | 1390 |  |  |
| High school degree | Pearson Chi-Square | 3.264c | 3 | .353 |
| Likelihood Ratio | 3.200 | 3 | .362 |
| Linear-by-Linear Association | 2.997 | 1 | .083 |
| N of Valid Cases | 1936 |  |  |
| Some college | Pearson Chi-Square | 2.148d | 3 | .542 |
| Likelihood Ratio | 2.172 | 3 | .538 |
| Linear-by-Linear Association | 2.030 | 1 | .154 |
| N of Valid Cases | 1360 |  |  |
| College degree | Pearson Chi-Square | 12.289e | 3 | .006 |
| Likelihood Ratio | 12.297 | 3 | .006 |
| Linear-by-Linear Association | 7.717 | 1 | .005 |
| N of Valid Cases | 1355 |  |  |
| Post-undergraduate degree | Pearson Chi-Square | 2.672f | 3 | .445 |
| Likelihood Ratio | 2.682 | 3 | .443 |
| Linear-by-Linear Association | .003 | 1 | .954 |
| N of Valid Cases | 359 |  |  |
| Total | Pearson Chi-Square | 37.677a | 3 | .000 |
| Likelihood Ratio | 37.313 | 3 | .000 |
| Linear-by-Linear Association | 36.537 | 1 | .000 |
| N of Valid Cases | 6400 |  |  |

|  |
| --- |
| a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 228.73. |
| b. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.02. |
| c. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 46.98. |
| d. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 52.98. |
| e. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 62.49. |
| f. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.45. |

**SUMMARY**

You can add a layer variable to create a three-way table in which categories of the row and column variables are further subdivided by categories of the layer variable.

This variable is sometimes referred to as the control variable because it may reveal how the relationship between the row and column variables changes when you "control" for the effects of the third variable.

But if you look at the table of **chi-square** statistics, you can easily see that in all but one of the education categories, the apparent relationship between income and PDA ownership disappears (typically, a significance value less than 0.05 is considered "significant"). This suggests that the apparent relationship between income and PDA ownership is merely an artifact of the underlying relationship between education level and PDA ownership

**OUTCOME**

Since income tends to rise as education rises, apparent relationships between income and other variables may actually be the result of differences in education.