

Interpreting an Independent Samples *t*-test in SPSS

Group Statistics

| Client Sex | | N | Mean | Std. Deviation | Std. Error Mean |
|------------|--------|-----|-------|----------------|-----------------|
| Client Age | Female | 120 | 32.48 | 7.399 | .675 |
| | Male | 301 | 30.43 | 9.646 | .556 |

Indicates number of subjects in the analysis (120 females and 301 males)

Indicates individual group means (females = 32.48 and males = 30.43)

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|------------|-----------------------------|---|------|------------------------------|---------|-----------------|-----------------|-----------------------|---|-------|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Client Age | Equal variances assumed | 14.534 | .000 | 2.094 | 419 | .037 | 2.050 | .979 | .126 | 3.973 |
| | Equal variances not assumed | | | 2.343 | 283.332 | .020 | 2.050 | .875 | .328 | 3.772 |

Indicates the probability of error (*p*)

Since the probability of error is < .05, the analyst must reject the null hypothesis of no difference and conclude that there is a significant difference between the mean ages of males and females.

Interpreting a One-way Analysis of Variance (ANOVA) in SPSS

Descriptives

Total Prior Convictions

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|------------------------------|-----|------|----------------|------------|----------------------------------|-------------|---------|---------|
| | | | | | Lower Bound | Upper Bound | | |
| 8th Grade or Below | 28 | 2.89 | 2.615 | .494 | 1.88 | 3.91 | 0 | 12 |
| 9th Grade Up (No Graduation) | 146 | 2.45 | 1.558 | .129 | 2.19 | 2.70 | 0 | 6 |
| Graduated High School | 112 | 1.87 | 1.359 | .128 | 1.61 | 2.12 | 0 | 5 |
| G.E.D. Certificate | 47 | 2.45 | 1.472 | .215 | 2.01 | 2.88 | 0 | 6 |
| Some College | 79 | 1.90 | 1.744 | .196 | 1.51 | 2.29 | 0 | 9 |
| Bachelor's Degree | 11 | 1.36 | 1.629 | .491 | .27 | 2.46 | 0 | 5 |
| Total | 423 | 2.19 | 1.656 | .081 | 2.03 | 2.35 | 0 | 12 |

Indicates number of subjects in the analysis (e.g. 112 subjects graduated high school)

Indicates individual group means (e.g. subjects possessing a G.E.D. had, on average, 2.45 prior convictions)

ANOVA

Total Prior Convictions

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|-----|-------------|-------|------|
| Between Groups | 52.406 | 5 | 10.481 | 3.955 | .002 |
| Within Groups | 1105.084 | 417 | 2.650 | | |
| Total | 1157.489 | 422 | | | |

Indicates the probability of error (p)

Since the probability of error is $< .05$, the analyst must reject the null hypothesis of no difference and conclude that there are significant differences in mean prior convictions among education categories.

Interpreting a Tukey's Post-hoc analysis in SPSS

Multiple Comparisons

Dependent Variable: Total Prior Convictions
Tukey HSD

| (I) Highest Year of Education Completed | (J) Highest Year of Education Completed | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|-----------------------|------------|-------|-------------------------|-------------|
| | | | | | Lower Bound | Upper Bound |
| 8th Grade or Below | 9th Grade Up (No Graduation) | .448 | .336 | .767 | -.51 | 1.41 |
| | Graduated High School | 1.027* | .344 | .035 | -.04 | 2.01 |
| | G.E.D. Certificate | .446 | .389 | .861 | -.67 | 1.56 |
| | Some College | .994 | .358 | .063 | -.03 | 2.02 |
| | Bachelor's Degree | 1.529 | .579 | .090 | -.13 | 3.19 |
| 9th Grade Up (No Graduation) | 8th Grade or Below | -.448 | .336 | .767 | -1.41 | .51 |
| | Graduated High School | .579 | .204 | .054 | -.01 | 1.16 |
| | G.E.D. Certificate | -.002 | .273 | 1.000 | -.78 | .78 |
| | Some College | .546 | .227 | .157 | -.10 | 1.20 |
| | Bachelor's Degree | 1.082 | .509 | .276 | -.38 | 2.54 |
| Graduated High School | 8th Grade or Below | -1.027* | .344 | .035 | -2.01 | -.04 |
| | 9th Grade Up (No Graduation) | -.579 | .204 | .054 | -1.16 | .01 |
| | G.E.D. Certificate | -.581 | .283 | .315 | -1.39 | .23 |
| | Some College | -.033 | .239 | 1.000 | -.72 | .65 |
| | Bachelor's Degree | .502 | .514 | .925 | -.97 | 1.98 |
| G.E.D. Certificate | 8th Grade or Below | -.446 | .389 | .861 | -1.56 | .67 |
| | 9th Grade Up (No Graduation) | .002 | .273 | 1.000 | -.78 | .78 |
| | Graduated High School | .581 | .283 | .315 | -.23 | 1.39 |
| | Some College | .548 | .300 | .449 | -.31 | 1.41 |
| | Bachelor's Degree | 1.083 | .545 | .352 | -.48 | 2.64 |
| Some College | 8th Grade or Below | -.994 | .358 | .063 | -2.02 | .03 |
| | 9th Grade Up (No Graduation) | -.546 | .227 | .157 | -1.20 | .10 |
| | Graduated High School | .033 | .239 | 1.000 | -.65 | .72 |
| | G.E.D. Certificate | -.548 | .300 | .449 | -1.41 | .31 |
| | Bachelor's Degree | .535 | .524 | .911 | -.96 | 2.04 |
| Bachelor's Degree | 8th Grade or Below | -1.529 | .579 | .090 | -3.19 | .13 |
| | 9th Grade Up (No Graduation) | -1.082 | .509 | .276 | -2.54 | .38 |
| | Graduated High School | -.502 | .514 | .925 | -1.98 | .97 |
| | G.E.D. Certificate | -1.083 | .545 | .352 | -2.64 | .48 |
| | Some College | -.535 | .524 | .911 | -2.04 | .96 |

Indicates a significant difference in prior convictions between the education categories 8th grade education or below and Graduated High School

Indicates the same as above

Specifically, since there were significant differences ONLY between 8th Grade or Below and Graduated High School...the analyst must modify the hypothesis analysis and conclude that **significant differences in mean number of prior convictions exist between those subjects with an 8th grade education or below and subjects who graduated from high school.**

*. The mean difference is significant at the .05 level.

Interpreting a Pearson's Product Moment Correlation in SPSS

Correlations

| | | Total Prior Convictions | Total Violations |
|-------------------------|---------------------|-------------------------|------------------|
| Total Prior Convictions | Pearson Correlation | 1 | .252** |
| | Sig. (2-tailed) | | .000 |
| | N | 427 | 406 |
| Total Violations | Pearson Correlation | .252** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 406 | 406 |

** . Correlation is significant at the 0.01 level (2-tailed).

Correlation coefficient (r) – examine for strength and direction

Probability of error (p)

Since the probability of error is $< .05$, the analyst must reject the null hypothesis of no directional relationship (or correlation) between total prior convictions and total (program) violations and conclude that there is a significant correlation between total prior convictions and total (program) violations.

Since there IS a significant directional relationship (correlation) between the two variables, the analyst must examine r (the correlation coefficient) for strength and direction. Direction is determined by ascertaining the sign of r (positive or negative). Strength is determined by the absolute value of r and its approximate distance to 1.

In this case, r is positive – indicating a POSITIVE correlation between total prior convictions and total (program) violations. This indicates that subjects with greater numbers of prior convictions will likely violate program guidelines at a higher rate.

However, the absolute value of r is not very close to 1, indicating a somewhat weak correlation. This could lead the analyst to conclude that **ALTHOUGH THERE IS A SIGNIFICANT CORRELATION BETWEEN TOTAL PRIOR CONVICTIONS AND TOTAL (PROGRAM) VIOLATIONS, THE CORRELATION IS RELATIVELY WEAK.**

Interpreting Crosstabulation and Chi Square (χ^2) in SPSS

Client Race * Client Sex Crosstabulation

| | | Client Sex | | Total | |
|------------------|----------------------|------------|--------|--------|-----|
| | | Female | Male | | |
| Client Race | Caucasian | Count | 78 | 151 | 229 |
| | % within Client Race | 34.1% | 65.9% | 100.0% | |
| | % within Client Sex | 65.0% | 50.5% | 54.7% | |
| | % of Total | 18.6% | 36.0% | 54.7% | |
| African-American | Count | 40 | 147 | 187 | |
| | % within Client Race | 21.4% | 78.6% | 100.0% | |
| | % within Client Sex | 33.3% | 49.2% | 44.6% | |
| | % of Total | 9.5% | 35.1% | 44.6% | |
| Hispanic | Count | 0 | 1 | 1 | |
| | % within Client Race | .0% | 100.0% | 100.0% | |
| | % within Client Sex | .0% | .3% | .2% | |
| | % of Total | .0% | .2% | .2% | |
| Native American | Count | 1 | 0 | 1 | |
| | % within Client Race | 100.0% | .0% | 100.0% | |
| | % within Client Sex | .8% | .0% | .2% | |
| | % of Total | .2% | .0% | .2% | |
| Other | Count | 1 | 0 | 1 | |
| | % within Client Race | 100.0% | .0% | 100.0% | |
| | % within Client Sex | .8% | .0% | .2% | |
| | % of Total | .2% | .0% | .2% | |
| Total | Count | 120 | 299 | 419 | |
| | % within Client Race | 28.6% | 71.4% | 100.0% | |
| | % within Client Sex | 100.0% | 100.0% | 100.0% | |
| | % of Total | 28.6% | 71.4% | 100.0% | |

Indicates that 65.9% of Caucasians are Male

Indicates that 50.5% of Males are Caucasians

If you get confused as to which percentage represents what, use RAW numbers to calculate the desired percentage:

What percentage of CAUCASIANS are MALE?

of Male Caucasians = 151
of Caucasians = 229

$151 / 229 = .6593$ OR **65.9%**

Chi-Square Tests

| | Value | df | Asymp. Sig. (2-sided) |
|------------------------------|---------------------|----|-----------------------|
| Pearson Chi-Square | 13.487 ^a | 4 | .009 |
| Likelihood Ratio | 13.956 | 4 | .007 |
| Linear-by-Linear Association | 2.094 | 1 | .148 |
| N of Valid Cases | 419 | | |

Probability of error (p)

Since the probability of error is $< .05$, the analyst must reject the null hypothesis of no relationship and conclude that there is a significant relationship between race and gender.

a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is .29.