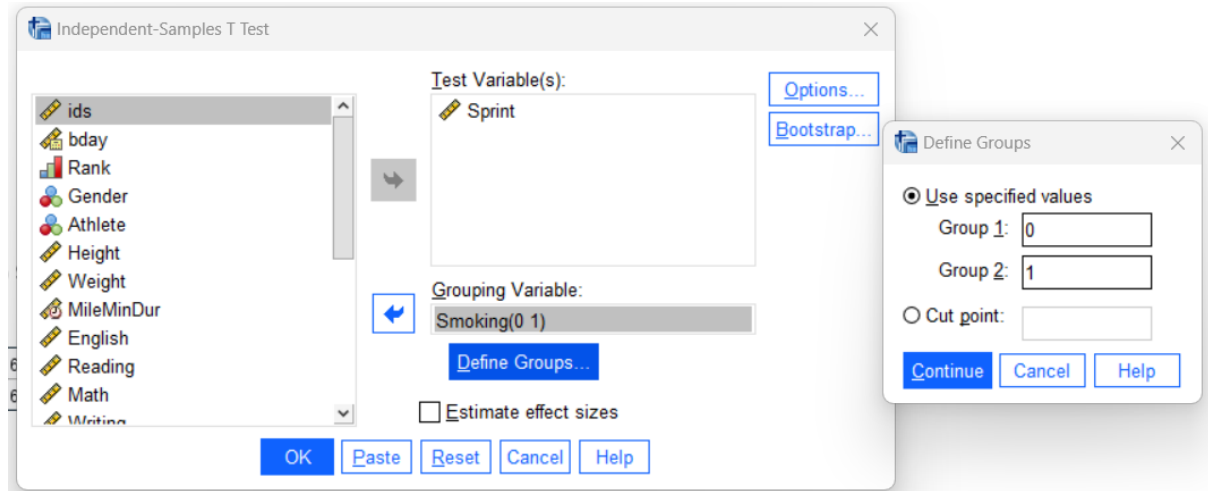


Motive

- Applying following SPSS Actions
 - Independent Sample T test
 - One Way Anova Test
- Using two datasets
 - Open-source dataset
 - dataset contains survey results from 435 students enrolled at a university in the United States.
 - ID number , Date of birth , Date of college , Expected date of college graduation , Class rank ,Gender ,Athlete , Height ,Weight , Smoking , sprint , MileMinDur , English Score , Reading Score, Math Score , Writing Score , State , LiveOnCampus , HowCommute , CommuteTime , SleepTime , StudyTime
 - Lecture dataset
 - ID , Gender , Age , Marital , Employment , QOL_total , Distress_total , Esteem_Q[1-10]

Open-Source Dataset

- Independent Sample T test



-
-

Group Statistics

| Smoking | N | Mean | Std. Deviation | Std. Error Mean |
|-------------------|-----|---------|----------------|-----------------|
| Sprint Non-smoker | 261 | 6.41149 | 1.251783 | .077483 |
| Past-smoker | 33 | 6.83533 | 1.024415 | .178328 |

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 95% Confidence Interval of the Difference | |
|--------|-----------------------------|---|------|------------------------------|--------|-----------------|-----------------|-----------------------|---|----------|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Sprint | Equal variances assumed | 2.728 | .100 | -1.867 | 292 | .063 | -.423847 | .227049 | -.870707 | .023014 |
| | Equal variances not assumed | | | -2.180 | 45.026 | .035 | -.423847 | .194434 | -.815450 | -.032243 |

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 99% Confidence Interval of the Difference | |
|--------|-----------------------------|---|------|------------------------------|--------|-----------------|-----------------|-----------------------|---|---------|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Sprint | Equal variances assumed | 2.728 | .100 | -1.867 | 292 | .063 | -.423847 | .227049 | -1.012534 | .164840 |
| | Equal variances not assumed | | | -2.180 | 45.026 | .035 | -.423847 | .194434 | -.946780 | .099086 |

Test for Variances : Sig > 0.05 so variance are equal (not significantly different)

Test for Means : Sig > 0.05 so means are equal (not significantly different)

Mean difference : -0.4 so past_smoker mean greater than no_smoker mean

95% confidence interval for mean difference: -0.9 -> 0

99% confidence interval for mean difference: -1 -> 0.2 (wider range than 95% interval)

- One Way Anova Test

One-Way ANOVA

Dependent List: Sprint

Factor: Smoking

☐ Estimate effect size for overall tests

OK Paste Reset Cancel Help

Contrasts... Post Hoc... Options... Bootstrap...

ids bday Rank Gender Athlete Height Weight MileMinDur English Reading Math Writing LiveOnCampus

One-Way ANOVA: Options

Statistics

☐ Descriptive

☐ Fixed and random effects

☒ Homogeneity of variance test

☐ Brown-Forsythe test

☐ Welch test

☐ Means plot

Missing Values

☒ Exclude cases analysis by analysis

☐ Exclude cases listwise

Confidence Intervals

Level(%): 0.95

Continue Cancel Help

One-Way ANOVA: Post Hoc Multiple Comparisons

Equal Variances Assumed

☐ LSD ☐ S-N-K ☐ Waller-Duncan

☐ Bonferroni ☒ Tukey Type I/Type II Error Ratio: 100

☐ Sidak ☐ Tukey's-b ☐ Dunnett

☐ Scheffe ☐ Duncan Control Category: Last

☐ R-E-G-W F ☐ Hochberg's GT2

☐ R-E-G-W Q ☐ Gabriel

Test

☒ 2-sided ☐ < Control ☐ > Control

Equal Variances Not Assumed

☐ Tamhane's T2 ☐ Dunnett's T3 ☐ Games-Howell ☐ Dunnett's C

Null Hypothesis test

☒ Use the same significance level [alpha] as the setting in Options

☐ Specify the significance level [alpha] for the post hoc test

Level: 0.05

Continue Cancel Help

Tests of Homogeneity of Variances

| | | Levene Statistic | df1 | df2 | Sig. |
|--------|--------------------------------------|------------------|-----|---------|------|
| Sprint | Based on Mean | 2.415 | 2 | 350 | .091 |
| | Based on Median | 2.322 | 2 | 350 | .100 |
| | Based on Median and with adjusted df | 2.322 | 2 | 343.190 | .100 |
| | Based on trimmed mean | 2.349 | 2 | 350 | .097 |

Sig > 0.05 so variances are homogenous/equal

ANOVA

Sprint

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|-----|-------------|-------|-------|
| Between Groups | 26.788 | 2 | 13.394 | 9.209 | <.001 |
| Within Groups | 509.082 | 350 | 1.455 | | |
| Total | 535.870 | 352 | | | |

Sig < 0.05 do they are not equal and there's significant difference

| (I) Smoking | (J) Smoking | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|----------------|----------------|-----------------------|------------|-------|-------------------------|---------|
| Non-smoker | Past-smoker | -.423847 | .222821 | .140 | -.94831 | .10061 |
| | Current-smoker | -.709429* | .173856 | <.001 | -1.11864 | -.30022 |
| Past-smoker | Non-smoker | .423847 | .222821 | .140 | -.10061 | .94831 |
| | Current-smoker | -.285582 | .262163 | .521 | -.90264 | .33148 |
| Current-smoker | Non-smoker | .709429* | .173856 | <.001 | .30022 | 1.11864 |
| | Past-smoker | .285582 | .262163 | .521 | -.33148 | .90264 |

*. The mean difference is significant at the 0.05 level.

Past_smoker is higher than non_smoker (diff = .4)

Current_smoker is higher than non_smoker (diff = 0.7)

Current_smoker is higher than past_smoker (diff = 0.3)

So the order by descending is : current_smoker then past_smoker then non_smoker

Lecture Dataset

- Independent Sample T test

Independent-Samples T Test

Test Variable(s):
Quality of life scale total score [...]

Options...
Bootstrap...

Grouping Variable:
Gender(0 1)

Define Groups...

☐ Estimate effect sizes

OK Paste Reset Cancel Help

○

Independent-Samples T Test

Test Variable(s):
Quality of life scale total score [...]

Options...
Bootstrap...

Grouping Variable:
Gender(? ?)

Define Groups...

☒ Estimate effect sizes

OK Paste Reset Cancel Help

Define Groups

☒ Use specified values

Group 1: 0

Group 2: 1

☐ Cut point:

Continue Cancel Help

| | | |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 1 | 0 | 0 |
| 0 | 2 | 3 |
| 3 | 2 | 3 |
| 3 | 2 | 3 |

○

Group Statistics

| | Gender | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------------------------|--------|-----|-------|----------------|-----------------|
| Quality of life scale total score | male | 91 | 10.86 | 3.990 | .418 |
| | female | 109 | 11.94 | 4.665 | .447 |

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | 95% Confidence Interval of the Difference | |
|-----------------------------------|-----------------------------|---|------|------------------------------|---------|-----------------|-----------------|-----------------------|--|---|-------|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | | Lower | Upper |
| Quality of life scale total score | Equal variances assumed | 2.490 | .116 | -1.738 | 198 | .084 | -1.079 | .621 | | -2.303 | .145 |
| | Equal variances not assumed | | | -1.762 | 197.875 | .080 | -1.079 | .612 | | -2.286 | .128 |

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | 99% Confidence Interval of the Difference | |
|-----------------------------------|-----------------------------|---|------|------------------------------|---------|-----------------|-----------------|-----------------------|--|---|-------|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | | Lower | Upper |
| Quality of life scale total score | Equal variances assumed | 2.490 | .116 | -1.738 | 198 | .084 | -1.079 | .621 | | -2.693 | .536 |
| | Equal variances not assumed | | | -1.762 | 197.875 | .080 | -1.079 | .612 | | -2.671 | .513 |

Test for Variances : Sig > 0.05 so variance are equal (not significantly different)

Test for Means : Sig > 0.05 so means are equal (not significantly different)

Mean difference : -1.08 so female mean greater than male mean

95% confidence interval for mean difference: -2.3 -> 0.15

99% confidence interval for mean difference: -2.7 -> 0.54 (wider range than 95% interval)

- One Way Anova Test

One-Way ANOVA

Dependent List:

Quality of life scale total score [QO...]

Factor:

Marital status [Marital]

☐ Estimate effect size for overall tests

OK Paste Reset Cancel Help

Contrasts... Post Hoc... Options... Bootstrap...

ID
Gender [Gender]
Age [Age]
Employment [Employment]
Distress scale total score [Distre...]
I am satisfied with myself [Esteem...]
I am good enough [Esteem_Q2]
I have a number of good qualities ...
I am able to do things [Esteem_...]
I hvae much to be proud of [Este...]
I do not feel useless [Esteem_Q6]
I am a person of worth [Esteem_...]
I have respect for myself [Esteem...

One-Way ANOVA: Post Hoc Multiple Comparisons

One-Way ANOVA: Options

Statistics

☐ Descriptive
☐ Fixed and random effects
☒ Homogeneity of variance test
☐ Brown-Forsythe test
☐ Welch test

☐ Means plot

Missing Values

☒ Exclude cases analysis by analysis
☐ Exclude cases listwise

Confidence Intervals

Level(%): 0.95

Continue Cancel Help

Equal Variances Assumed

☐ LSD ☐ S-N-K ☐ Waller-Duncan
☐ Bonferroni ☒ Tukey Type I/Type II Error Ratio: 100
☐ Sidak ☐ Tukey's-b ☐ Dunnett
☐ Scheffe ☐ Duncan Control Category: Last
☐ R-E-G-W F ☐ Hochberg's GT2
☐ R-E-G-W Q ☐ Gabriel

Test

☒ 2-sided ☐ < Control ☐ > Control

Equal Variances Not Assumed

☐ Tamhane's T2 ☐ Dunnett's T3 ☐ Games-Howell ☐ Dunnett's C

Null Hypothesis test

☒ Use the same significance level [alpha] as the setting in Options
☐ Specify the significance level [alpha] for the post hoc test

Level: 0.05

Continue Cancel Help

Tests of Homogeneity of Variances

| | | Levene Statistic | df1 | df2 | Sig. |
|-----------------------------------|--------------------------------------|------------------|-----|---------|------|
| Quality of life scale total score | Based on Mean | .983 | 2 | 197 | .376 |
| | Based on Median | .708 | 2 | 197 | .494 |
| | Based on Median and with adjusted df | .708 | 2 | 195.081 | .494 |
| | Based on trimmed mean | .945 | 2 | 197 | .390 |

Sig > 0.05 so variances are homogenous/equal

ANOVA

Quality of life scale total score

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|-----|-------------|--------|-------|
| Between Groups | 643.663 | 2 | 321.831 | 19.827 | <.001 |
| Within Groups | 3197.732 | 197 | 16.232 | | |
| Total | 3841.395 | 199 | | | |

Sig < 0.05 do they are not equal and there's significant difference

Multiple Comparisons

Dependent Variable: Quality of life scale total score

Tukey HSD

| (I) Marital status | (J) Marital status | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|--------------------------|--------------------------|-----------------------|------------|-------|-------------------------|-------------|
| | | | | | Lower Bound | Upper Bound |
| married, common law | widow, divorce, separate | 4.381* | .712 | <.001 | 2.70 | 6.06 |
| | single, never married | 1.423 | .695 | .104 | -.22 | 3.06 |
| widow, divorce, separate | married, common law | -4.381* | .712 | <.001 | -6.06 | -2.70 |
| | single, never married | -2.958* | .689 | <.001 | -4.59 | -1.33 |
| single, never married | married, common law | -1.423 | .695 | .104 | -3.06 | .22 |
| | widow, divorce, separate | 2.958* | .689 | <.001 | 1.33 | 4.59 |

*. The mean difference is significant at the 0.05 level.

Married/common_law is higher than widow/divorce/separate (diff = 4.4)

Single/never_married is higher than widow/divorce/separate (diff = 3)

Married/common_law is higher than Single/never_married (diff = 1.4)

So the order by descending is : Married/common_law then Single/never_married then widow/divorce/separate