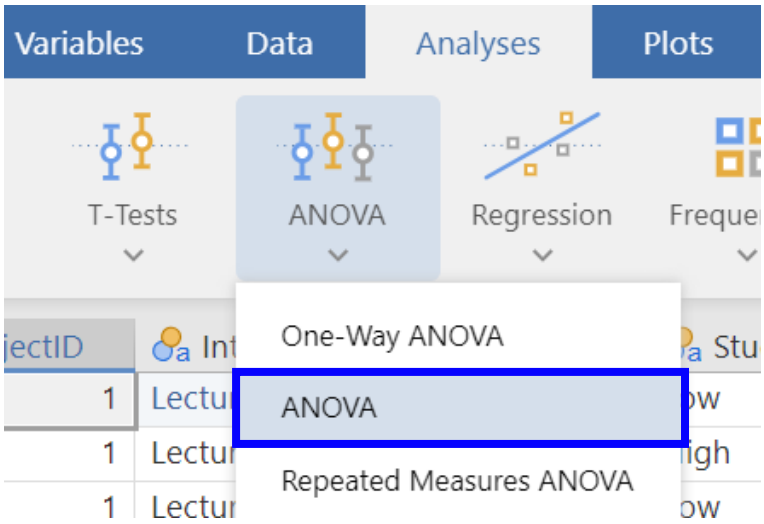
Factorial ANOVA in Jamovi

Step 1: Open the analysis

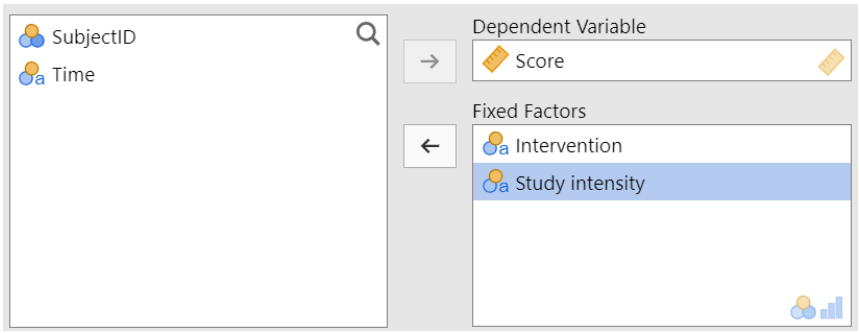
From the menu:
1. Analyses
2. ANOVA
3. ANOVA (Factorial)



Step 2: Assign Variables

Move your variables into the correct fields:

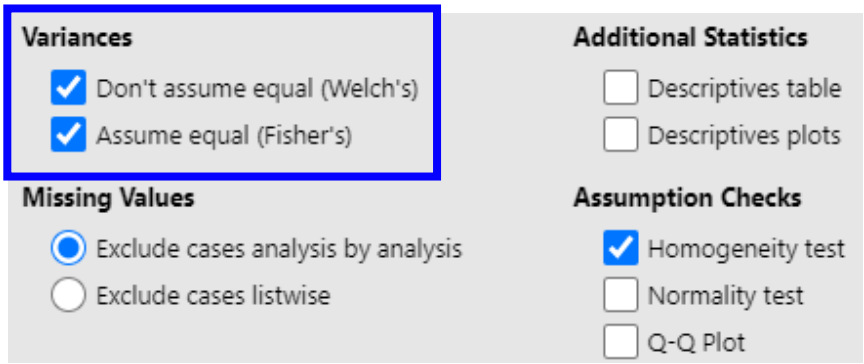
- Numerical response → Dependent Variables
- Categorical variable → Fixed Factors



Step 3: Select Model

Under Variances select either:

- **Fisher's ANOVA** use when variances are similar (Levene's p ≥ 0.05)
- **Welch's ANOVA** use when variances differ substantially (Levene's p < 0.05)



One-Way ANOVA

		F	df1	df2	p
Score	Welch's	49.6	2	77.1	<.001
	Fisher's	56.6	2	117	<.001

Homogeneity of Variances Test (Levene's)

	F	df1	df2	p
Score	2.07	2	117	.130

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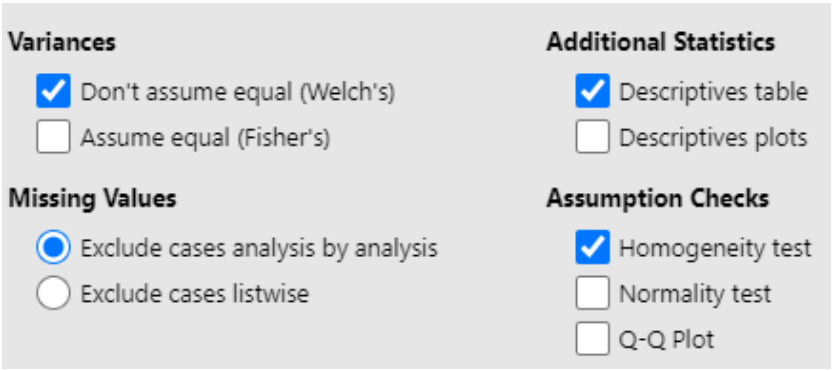
Step 4: Additional statistics

Optional additional statistics:

- Descriptives
- Descriptive plots
- Homogeneity test (Levene's test)



One-Way ANOVA (Welch's)

	F	df1	df2	p
Score	49.6	2	77.1	<.001

Homogeneity of Variances Test (Levene's)

	F	df1	df2	p
Score	2.07	2	117	.130

Group Descriptives

	Intervention	N	Mean	SD	SE
Score	Lecture	40	78.9	3.48	0.551
	Online learning	40	74.4	4.34	0.686
	Interactive/group-based learning	40	84.1	4.31	0.682

Step 5: Selecting Post-Hoc Tests

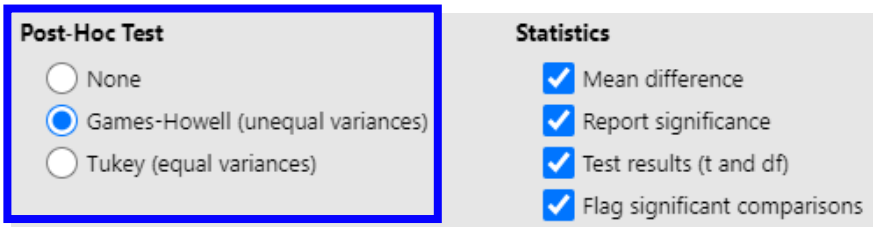
In Post-Hoc Tests select:

- **Tukey:** use when group variances are equal (Levene's p ≥ 0.05)
- **Games-Howell:** use when group variances are unequal (Levene's p < 0.05)

Tip:

Match your post-hoc test to the ANOVA reported:

- Tukey with Fisher's ANOVA
- Games-Howell with Welch's ANOVA



		Lecture	Online learning	Interactive/group-based learning
Lecture	Mean difference	—	4.50***	-5.16***
	t-value	—	5.12	-5.89
	df	—	74.5	74.7
	p-value	—	<.001	<.001
Online learning	Mean difference		—	-9.66***
	t-value		—	-9.99
	df		—	78.0
	p-value		—	<.001
Interactive/group-based learning	Mean difference			—
	t-value			—
	df			—
	p-value			—

Note. * p < .05, ** p < .01, *** p < .001

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Example interpretation and summary

The one-way ANOVA showed that exam scores differed significantly across the three intervention groups, $F(2, 77.1) = 49.6$, $p < .001$.

Interpretation:

- $p < .001$ → significant difference between groups
- Welch's ANOVA used (robust to unequal variances)
- Levene's test ($p = .130$) → equal variances assumed

Group Means:

- Lecture: Mean = 78.9
- Online learning: Mean = 74.4
- Interactive/group-based learning: Mean = 84.1

Conclusion:

There is a significant difference in exam scores between teaching methods, with interactive/group-based learning producing the highest performance.

Related helpsheets

- One Sample T-Test in Jamovi
- Paired Sample T-Test in Jamovii

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