

Which factor is within subjects? week

Which factor is between subjects? career path

**PART A Assumptions**

Explain why Mauchly’s test of sphericity was not tested in this example.

because the within-subjects factor had just two levels

To test for HOV, look at the Levene’s test results:

	F value	prob	signif (y/n)	assumption holds true (y/n)
Week 1	1.35	.276	n	y
Week 15	.52	.598	n	y

**PART B Inferential Statistics**

Effect tested	df , df	F value	Sig value	Partial eta sq	Signif? y/n
main effect week	1, 27	19.65	<.001	.421	y
main effect of career path	2, 27	8.23	.002	.379	y
week x career path	2, 27	3.94	.032	.226	y

Write down all 3 effects using correct APA statistical notation format.

main effect of week	$F(1,27) = 19.65, p < .001, \eta_p^2 = .421$
main effect of career path	$F(2,27) = 8.23, p = .002, \eta_p^2 = .379$

week X career path	$F(2,27) = 3.94, p = .032, \eta_p^2 = .226$
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### PART C Post hoc tests

Was a post hoc test on the between-subjects factor necessary? Explain why or why not.

Yes. The between subjects factor (career path) has three levels and it was significant. That said, we would not look at the post hoc test in this case because the interaction effect was significant. We will focus our attention there.

Was a post hoc test necessary for the within-subjects factor? Explain why or why not.

A post hoc test on the within-subjects factor (week), even though significant, was not necessary because it only has two levels.

### PART D Understanding the Interaction Effect

Look at your graph to help answer the questions below. Use the “refined” overlapping nonoverlapping error bar rule you learned about to see which mean is probably different from which.

Describe the effect of week in the **clinical path** and specify the direction of the differences, if any.

By the end of week 15, attitudes toward statistics increased for the clinical path students - probably

Describe the effect of week in the **research path** and specify the direction of the differences, if any.

By the end of week 15, attitudes toward statistics increased for the research path students - probably

Describe the effect of week in the **not psych path** and specify the direction of the differences, if any.

By the end of week 15, attitudes toward statistics did not change for the not psych path students - probably

Describe the effect of career path for **week 1** and specify the direction of the differences, if any.

At week 1, attitudes toward statistics were approximately the same for all three career path groups – probably.

Describe the effect of career path for **week 15** and specify the direction of the differences, if any.

At week 15, attitudes toward statistics were equally high for the clinical and research groups and both were higher than the not psych path group - probably!

## General Linear Model

### Within-Subjects Factors

Measure: MEASURE\_1

	Dependent Variable
week	
1	week_1
2	week_15

### Between-Subjects Factors

	Value	Label	N
Career	1.00	clinical	10
	2.00	research	10
	3.00	not psych	10

### Descriptive Statistics

	Career	Mean	Std. Deviation	N
week_1	Clinical	-.4000	4.08792	10
	Research	1.2000	2.69979	10
	not psych	.1000	2.76687	10
	Total	.3000	3.20721	30
week_15	Clinical	5.1000	2.51440	10
	Research	6.0000	2.58199	10
	not psych	.5000	2.17307	10
	Total	3.8667	3.39100	30

### Box's Test of Equality of Covariance Matrices<sup>a</sup>

Box's M	11.863
F	1.765
df1	6
df2	18168.923
Sig.	.102

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Career

Within Subjects Design:

week

### Multivariate Tests<sup>a</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
week	Pillai's Trace	.421	19.646 <sup>b</sup>	1.000	27.000	<.001	.421
	Wilks' Lambda	.579	19.646 <sup>b</sup>	1.000	27.000	<.001	.421
	Hotelling's Trace	.728	19.646 <sup>b</sup>	1.000	27.000	<.001	.421
	Roy's Largest Root	.728	19.646 <sup>b</sup>	1.000	27.000	<.001	.421
week * Career	Pillai's Trace	.226	3.935 <sup>b</sup>	2.000	27.000	.032	.226
	Wilks' Lambda	.774	3.935 <sup>b</sup>	2.000	27.000	.032	.226
	Hotelling's Trace	.291	3.935 <sup>b</sup>	2.000	27.000	.032	.226
	Roy's Largest Root	.291	3.935 <sup>b</sup>	2.000	27.000	.032	.226

a. Design: Intercept + Career

Within Subjects Design: week

b. Exact statistic

### Mauchly's Test of Sphericity<sup>a</sup>

Measure: MEASURE\_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Greenhouse-Geisser	Epsilon <sup>b</sup> Huynh-Feldt	Lower-bound
week	1.000	.000	0	.	1.000	1.000	1.000

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + Career

Within Subjects Design: week

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

### Tests of Within-Subjects Effects

Measure: MEASURE\_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
week	Sphericity Assumed	190.817	1	190.817	19.646	<.001	.421
	Greenhouse-Geisser	190.817	1.000	190.817	19.646	<.001	.421
	Huynh-Feldt	190.817	1.000	190.817	19.646	<.001	.421
	Lower-bound	190.817	1.000	190.817	19.646	<.001	.421
week * Career	Sphericity Assumed	76.433	2	38.217	3.935	.032	.226
	Greenhouse-Geisser	76.433	2.000	38.217	3.935	.032	.226
	Huynh-Feldt	76.433	2.000	38.217	3.935	.032	.226
	Lower-bound	76.433	2.000	38.217	3.935	.032	.226
Error(week)	Sphericity Assumed	262.250	27	9.713			
	Greenhouse-Geisser	262.250	27.000	9.713			
	Huynh-Feldt	262.250	27.000	9.713			
	Lower-bound	262.250	27.000	9.713			

### Tests of Within-Subjects Contrasts

Measure: MEASURE\_1

Source		week	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
week	Linear		190.817	1	190.817	19.646	<.001	.421
week * Career	Linear		76.433	2	38.217	3.935	.032	.226
Error(week)	Linear		262.250	27	9.713			

### Levene's Test of Equality of Error Variances<sup>a</sup>

		Levene Statistic	df1	df2	Sig.
week_1	Based on Mean	1.350	2	27	.276
	Based on Median	1.013	2	27	.376
	Based on Median and with adjusted df	1.013	2	21.461	.380
	Based on trimmed mean	1.271	2	27	.297
week_15	Based on Mean	.524	2	27	.598

Based on Median	.195	2	27	.824
Based on Median and with adjusted df	.195	2	23.931	.824
Based on trimmed mean	.541	2	27	.588

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Career

Within Subjects Design: week

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	260.417	1	260.417	38.623	<.001	.589
Career	111.033	2	55.517	8.234	.002	.379
Error	182.050	27	6.743			

### Profile Plots

