

Means Tables to go with Factorial MANCOVA Handout (factmancova_eg.pdf)

Initial 2x2 Factorial Analyses → each DVs and Covariate

Fig #1 2x2 Factorial ANOVA DV = Performance

	Group 1		Group 2	
Pop 1	35.5	<	45.6	40.8
	^			^
Pop 2	55.7	>	43.7	51.8
	48.0	=	44.8	

Fig #2 2x2 Factorial ANOVA DV = Evaluation Rating

	Group 1		Group 2	
Pop 1	3.7	=	3.2	3.5
	^		^	^
Pop 2	5.8	=	5.2	5.6
	5.0	=	4.1	

Fig #3 2x2 Factorial ANOVA DV = Performance Pretest – looking for confounding

	Group 1		Group 2	
Pop 1	21.1	=	21.2	21.15
	^			
Pop 2	34.7	>	20.6	30.1
	29.5	>	20.9	

Significant confounding highlighted in red.

Notice this cell has a much higher mean on the covariate than the other cells.

2x2 Factorial ANOVAs → each DV

DV = Performance

Original Factorial ANOVA...

Fig #1 2x2 Factorial ANOVA DV = Performance

	Group 1		Group 2	
Pop 1	35.5	<	45.6	40.8
	^			^
Pop 2	55.7	>	43.7	51.8
	48.0	=	44.8	

Now the Factorial ANCOVA...

Fig #4 2x2 Factorial ANCOVA DV = Performance Covariate = Performance Pretest

	Group 1		Group 2	
Pop 1	37.7	<	47.8	42.8
	^			^
Pop 2	47.6	=	46.2	46.9
	44.7	=	47.0	

Differences from 2x2 factorial ANOVA highlighted in red.

Notice the corrected mean for this cell is very different from the uncorrected mean.

Notice that the “shape” of the interaction has changed with the ANCOVA correction.

2x2 Factorial ANOVAs → each DV

DV = Evaluation Rating

Original Factorial ANOVA...

Fig #2 2x2 Factorial ANOVA DV = Evaluation Rating

	Group 1		Group 2	
Pop 1	3.7	=	3.2	3.5
	^		^	^
Pop 2	5.8	=	5.2	5.6
	5.0	=	4.1	

Now the Factorial ANCOVA...

Fig #5 2x2 Factorial ANCOVA DV = Evaluation Rating Covariate = Performance Pretest

	Group 1		Group 2	
Pop 1	4.4	=	4.0	3.5
			^	^
Pop 2	4.5	<	6.0	5.6
	4.5	=	5.0	

Differences from 2x2 factorial ANOVA highlighted in red.

Notice the corrected mean for this cell is very different from the uncorrected mean (smaller).

Notice that there is now an interaction (there wasn't one in the original ANOVA)

Notice there is still not a main effect for Group – but the direction of the non-significant effect has reversed.

2x2 Factorial MANCOVA

Fig #1 2x2 Factorial ANOVA DV = Performance

	Group 1		Group 2	
Pop 1	35.5	<	45.6	40.8
	^			^
Pop 2	55.7	>	43.7	51.8
	48.0	=	44.8	

Fig #2 2x2 Factorial ANOVA DV = Evaluation Rating

	Group 1		Group 2	
Pop 1	3.7	=	3.2	3.5
	^		^	^
Pop 2	5.8	=	5.2	5.6
	5.0	=	4.1	

Fig #6 2x2 Factorial MANCOVA

DV = Performance & Evaluation Rating Covariate = Performance Pretest

	Group 1		Group 2	
Pop 1	-.49	<	.12	-.33
	^			^
Pop 2	.19	=	.15	.26
	-.10	<	.07	

Interaction variate → Performance

Group main effect Variate → Performance & Evaluation Rating

Pop main effect Variate → Performance & Evaluation Rating