Factorial MANOVA

- Does basically the same thing as a 1-way MANOVA, except → a separate composite variable (or set of composite variables) is constructed for **each effect** (i.e., each main effect and the interaction).
- Similarly, follow-ups have to be done for each canonical variate, for each effect

For a demo, I'll use the 2x2 with only the first 2 REIN groups from kxkbg_mult.sav
Using MANOVA currently requires the use of syntax code …

```
manova numcor numtry resptime by rein (1, 2)   task (1, 2)      ← list DVs  by IV(s) (with min & max grps)
 / print = signif (multiv, univ, eigen, dimenr)                  ← gets various goodies
 / discrim stan cor.                                             ← don't forget the period !
```

```
* * * * * * A n a l y s i s   o f   V a r i a n c e -- design   1 * * * * * *

 EFFECT .. REIN BY TASK
 Multivariate Tests of Significance (S = 1, M = 1/2, N = 6 )

 Test Name         Value    Exact F Hypoth. DF   Error DF  Sig. of F

 Pillais          .78417   16.95548       3.00      14.00       .000
 Hotellings      3.63332   16.95548       3.00      14.00       .000
 Wilks            .21583   16.95548       3.00      14.00       .000
 Roys             .78417
 Note.. F statistics are exact.

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 Eigenvalues and Canonical Correlations

 Root No.    Eigenvalue        Pct.   Cum. Pct.  Canon Cor.

        1         3.633     100.000     100.000        .886

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 EFFECT .. REIN BY TASK (Cont.)
 Univariate F-tests with (1,16) D. F.

 Variable   Hypoth. SS   Error SS Hypoth. MS   Error MS          F  Sig. of F

 NUMCOR       33.76686   67.62810   33.76686    4.22676    7.98884       .012
 NUMTRY        1.36961  471.41013    1.36961   29.46313     .04649       .832
 RESPTIME    215.73464   76.66468  215.73464    4.79154   45.02405       .000

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 EFFECT .. REIN BY TASK (Cont.)
 Standardized discriminant function coefficients
          Function No.
 Variable            1
 NUMCOR           -.467
 NUMTRY            .044
 RESPTIME          .938

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Correlations between DEPENDENT and canonical variables
          Canonical Variable

 Variable            1
 NUMCOR           -.371
 NUMTRY            .028
 RESPTIME          .880
```

* * * * * * A n a l y s i s o f V a r i a n c e -- design 1 * * * * * *

EFFECT .. TASK
Multivariate Tests of Significance (S = 1, M = 1/2, N = 6)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.78003	16.54840	3.00	14.00	.000
Hotellings	3.54608	16.54840	3.00	14.00	.000
Wilks	.21997	16.54840	3.00	14.00	.000
Roys	.78003				

Note.. F statistics are exact.

- -

Eigenvalues and Canonical Correlations

Root No.	Eigenvalue	Pct.	Cum. Pct.	Canon Cor.
1	3.546	100.000	100.000	.883

- -

EFFECT .. TASK (Cont.)
Univariate F-tests with (1,16) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
NUMCOR	43.22360	67.62810	43.22360	4.22676	10.22619	.006
NUMTRY	96.86760	471.41013	96.86760	29.46313	3.28776	.089
RESPTIME	181.17216	76.66468	181.17216	4.79154	37.81082	.000

- -

EFFECT .. TASK (Cont.)
Standardized discriminant function coefficients

	Function No.
Variable	1
NUMCOR	-.575
NUMTRY	-.259
RESPTIME	.850

- -

Correlations between DEPENDENT and canonical variables

	Canonical Variable
Variable	1
NUMCOR	-.425
NUMTRY	-.241
RESPTIME	.816

_

```
* * * * * * A n a l y s i s   o f   V a r i a n c e -- design   1 * * * * * *

 EFFECT .. REIN
 Multivariate Tests of Significance (S = 1, M = 1/2, N = 6 )

 Test Name         Value    Exact F Hypoth. DF   Error DF  Sig. of F

 Pillais          .79570   18.17551       3.00      14.00       .000
 Hotellings      3.89475   18.17551       3.00      14.00       .000
 Wilks            .20430   18.17551       3.00      14.00       .000
 Roys             .79570
 Note.. F statistics are exact.

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 Eigenvalues and Canonical Correlations

 Root No.    Eigenvalue        Pct.   Cum. Pct.  Canon Cor.

        1         3.895     100.000     100.000        .892

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 EFFECT .. REIN (Cont.)
 Univariate F-tests with (1,16) D. F.

 Variable   Hypoth. SS   Error SS Hypoth. MS   Error MS          F  Sig. of F

 NUMCOR       33.79689   67.62810   33.79689    4.22676    7.99594       .012
 NUMTRY      169.64191  471.41013  169.64191   29.46313    5.75777       .029
 RESPTIME    209.61382   76.66468  209.61382    4.79154   43.74662       .000

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 EFFECT .. REIN (Cont.)
 Standardized discriminant function coefficients
          Function No.

 Variable            1
 NUMCOR           -.521
 NUMTRY           -.309
 RESPTIME          .859

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 Correlations between DEPENDENT and canonical variables
          Canonical Variable

 Variable            1
 NUMCOR           -.358
 NUMTRY           -.304
 RESPTIME          .838
```

Follow-ups???

- Don't need them for the 2-group main effects -- interpret the canonical variates and you're done
- Need one for the interaction (need to look as simple effects to describe the interaction pattern), so…

Compute int_1 = (znumcor * -.521) + (znumtry * -.309) + (zresptim * .859).

Do the 2x2 ANOVA and then LSD to decide the simple effect pattern (and check on the ME descriptiveness)