Single-Factor MANOVA

1-way MANOVA:

- like ldf, takes multiple DVs and combines them into a "composite variable" that will have the largest possible F-value across those groups
- As with ldf, as many composite variables can be made as the smaller of # groups - 1 or the number of DVs
- You can examine the standardized weights and the structure weights to "interpret" the canonical variate
- If there are only 2 groups, the significance test is sufficient -- but if there are 3 or more groups, you will need to construct a score for each person (for each significant variate) and perform analyses upon these scores

For a demo, I'll use the 3-group variable REIN, from kxkbg_mult.sav (this is the 3-DV version of the reinforcement by task type data).

Using MANOVA currently requires the use of syntax code …

```
manova numcor numtry resptime by rein (1, 3)        ← 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 !
```

```
EFFECT .. REIN
Multivariate Tests of Significance (S = 2, M = 0, N = 11 1/2)

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

Pillais          .81738    5.99004       6.00      52.00       .000
Hotellings      1.42136    5.68542       6.00      48.00       .000
Wilks            .34566    5.84075       6.00      50.00       .000
Roys             .47185
Note.. F statistic for WILKS' Lambda is exact.

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Eigenvalues and Canonical Correlations

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

       1          .893      62.856      62.856        .687
       2          .528      37.144     100.000        .588

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Dimension Reduction Analysis

Roots        Wilks L.          F Hypoth. DF   Error DF  Sig. of F

1 TO 2         .34566    5.84075       6.00      50.00       .000
2 TO 2         .65447    6.86327       2.00      26.00       .004

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EFFECT .. REIN (Cont.)
Univariate F-tests with (2,27) D. F.

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

NUMCOR       56.01525  180.04054   28.00762    6.66817    4.20020       .026
NUMTRY      199.57255  691.86066   99.78627   25.62447    3.89418       .033
RESPTIME    318.86314  532.71385  159.43157   19.73014    8.08061       .002

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```

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

 Variable            1          2

 NUMCOR           .917       .472
 NUMTRY           .293       .631
 RESPTIME        1.192      -.307

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 EFFECT .. REIN (Cont.)
 Correlations between DEPENDENT and canonical variables
           Canonical Variable

 Variable            1          2

 NUMCOR           .263       .687
 NUMTRY           .101       .727
 RESPTIME         .612      -.707

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```

Both variates are significant, but we don't know which groups are significant on which variates. We could re-analyze the data as an ldf and use the save command there to construct the variates, but since that approach won't work with factorial designs, might as well learn how to do it by hand…

Analyze → Descriptive Statistics → Descriptives

- Highlight and move the DVs
- Check the "Save standardized variables as variates" box

Using the standardized discriminant function coefficients from above compose a compute statement for each significant variate in the syntax window.

```
Compute rein_1 = (znumcor * .917) + (znumtry * .293) + (zresptim * 1.192).
Compute rein_2 = (znumcor * .472) + (znumtry * .631) + (zresptim * -.307).
```

Now just do an ANOVA for each, and follow-up with LSD as you normally would…