

Quiz #3 Example of Canonical Correlation

The purpose of the research was to examine the relationships between measures of mental health (depression, stress & loneliness) and social support (total, significant other, family & friend).

SPSS Code:

```
variable labels dep `depression'
  ruls 'loneliness'/
  tss 'total social support'/
  soss 'significant other social support'/
  fass 'family social support'/
  frss 'friend social support'.

corr tss fass frss soss dep ruls stress .
```

SPSS Output: Here is the correlation matrix, partitioned into the two sets of variables.

Correlations:	TSS	FASS	FRSS	SOSS	DEP	RULS	STRESS
TSS	1.0000	.8280**	.8136**	.8569**	-.3691**	-.6282**	-.1849**
FASS	.8280**	1.0000	.5192**	.5972**	-.3218**	-.4945**	-.2049**
FRSS	.8136**	.5192**	1.0000	.6109**	-.3150**	-.5774**	-.1132
SOSS	.8569**	.5972**	.6109**	1.0000	-.3044**	-.5266**	-.1291*
DEP	-.3691**	-.3218**	-.3150**	-.3044**	1.0000	.5368**	.4872**
RULS	-.6282**	-.4945**	-.5774**	-.5266**	.5368**	1.0000	.2846**
STRESS	-.1849**	-.2049**	-.1132	-.1291*	.4872**	.2846**	1.0000

N of cases: 405 2-tailed Signif: * - .01 ** - .001

SPSS Code:

canonical correlation is available using syntax code for MANOVA, setting one set of variables as the “dependent” and the other set as the “covariates” with no “IVs”

```
manova tss fass frss soss with dep ruls stress                      ← identifies the sets of variables
  /print signif(multiv dimenr eigen)                                ← asks for canonical analysis
  /discrim raw stan cor.                                               ← requests info to interpret the canonicals
```

SPSS Output:

EFFECT .. WITHIN CELLS Regression
Multivariate Tests of Significance (S = 3, M = 0, N = 198)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.42888	16.68088	12.00	1200.00	.000
Hotellings	.71377	23.59403	12.00	1190.00	.000
Wilks	.57895	20.14088	12.00	1053.30	.000
Roys	.40981				

← omnibus tests

Dimension Reduction Analysis

Roots	Wilks L.	F Hypoth.	DF	Error DF	Sig. of F
1 TO 3	.57895	20.14088	12.00	1053.30	.000
2 TO 3	.98095	1.28534	6.00	798.00	.261
3 TO 3	.99873	.25506	2.00	400.00	.775

Tests of each canonical
← only 1st is statistically significant

Eigenvalues and Canonical Correlations

Root No.	Eigenvalue	Pct.	Cum. Pct.	Canon Cor.	Sq. Cor
1	.694	97.282	97.282	.640	.410
2	.018	2.539	99.821	.133	.018
3	.001	.179	100.000	.036	.001

Raw canonical coefficients for DEPENDENT variables Standardized canonical coeffs for DEPENDENT variables Correlations between DEPENDENT and canonical

TSS	-.440	-.520	-.983
FASS	-.062	-.089	-.773
FRSS	-.288	-.376	-.905
SOSS	-.065	-.096	-.825

Raw canonical coefficients for COVARIATES coeffs Standardized canonical for COVARIATES and Corrs between COVARIATES canonical variables

DEP	.012	.080	.576
RULS	.085	.969	.998
STRESS	-.007	-.050	.265

Interpretation is usually based on the combination of the standardized weights and the structure (as in ldf).

Variance explained by canonical variables of DEPENDENT variables (social support)

Tells us -- % of variance among the dependent variables accounted for by the dep and cov canonical variates, respectively

CAN. VAR.	Pct Var DE	Cum Pct DE	Pct Var CO	Cum Pct CO
1	76.555	76.555	31.373	31.373

a "PC" -- how much variance among the dependent variables is accounted for by the dependent canonical variate

a "rd" -- how much variance among the dependent variables is accounted for by the covariate canonical variate

Variance explained by canonical variables of the COVARIATES (mental health)

Tells us -- % of variance among the covariates accounted for dep and cov canonical variates, respectively

CAN. VAR.	Pct Var DE	Cum Pct DE	Pct Var CO	Cum Pct CO
1	19.089	19.089	46.580	46.580

a "rd" -- how much variance among the covariates is accounted for by the dependent canonical variate

a "PC" -- how much variance among the covariates is accounted for by the covariate canonical variate

Depiction of the "Variances Accounted For" in this Analysis

