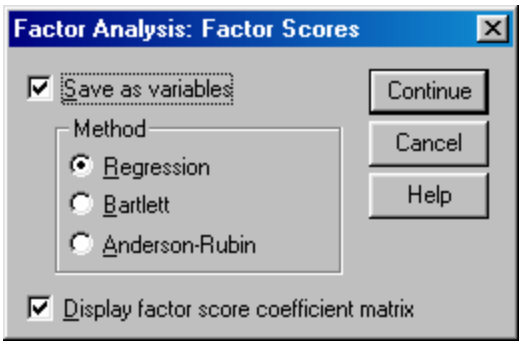
Factor Scores

Getting Proper Factor Scores



Using the "Factor Scores" window will allow you to get proper factor scores for what every factoring you choose:

- Extraction procedure
- # factors
- rotation

You can also get the "factor score coefficient matrix -- the weights used to compute the factor scores

Component Score Coefficient Matrix

	Component		
	1	2	3
physical aggression	.341	.053	.037
property damage	.385	-.075	-.042
theft	.382	-.189	.050
extreme verbal abuse	.179	.267	.048
sad	-.153	.453	.016
anxious	-.063	.463	.094
self-confidence	.061	.111	.589
compliance	-.012	.029	.523

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Component Scores.

Some have proposed using this matrix as the basis for interpretation -- since it is the set of weights used to compute the factor scores.

Remember, though, that these are βs -- they tell the unique contribution of each variable to the factor score. So, a set of strongly collinear variables that are highly correlated with the factor (as shown in the structure matrix) are likely to have very low weights in this matrix…

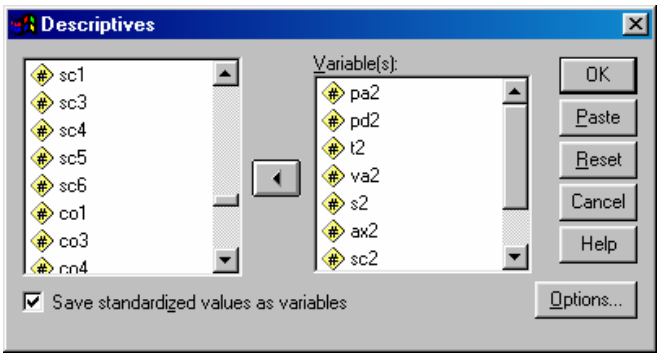
Getting Improper Factor Scores

Improper factor scores can be computed from either raw or Z-score variables. When which?

- Z-scores are useful when the variables have different means and/or standard deviations.
  - Otherwise the score will be dominated by the variables with the largest values
  - Imagine forming a composite variable from GRE and GPA scores -- the GPA (M=3.5, S=1) will "get lost" when combined with the GRE (M=500, S=100)

- Raw scores "work better" when the variables being combined have similar means and stds
  - Individual items -- works best with the same response scale → combining 5-choice and binary items can lead to "domination" by the multi-response variable
  - Set of scores that are "scaled" to the same mean and std
    - MMPI scores are all scaled to population values of M=50 and S=10
    - GRE Q, A & V are all scaled to M=500 and S = 100

Analyze → Descriptive Statistics → Descriptives



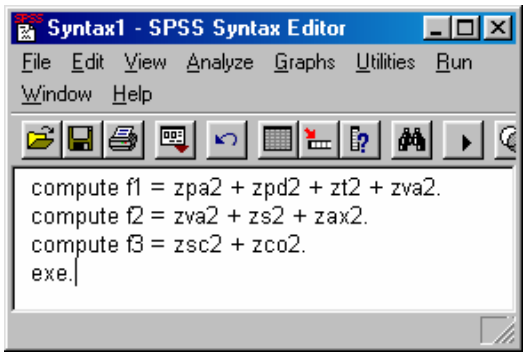
Remember that some of these variables are frequency-of-occurrence counts (which differ considerably in likelihood) and others are ratings.

Notice the variability in means and stds below.

So, converting to Z-scores is a good idea…

Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
physical aggression	.00	12.00	1.3617	2.59954
property damage	.00	6.00	.7447	1.49591
theft	.00	4.00	.4681	1.01833
extreme verbal abuse	.00	14.00	2.9574	3.75880
sad	.00	6.00	.9574	1.54579
anxious	.00	7.00	1.3404	2.09841
self-confidence	3.00	32.00	25.6596	5.98286
compliance	5.00	32.00	24.9787	6.28832



Correlations

		REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 1 for analysis 2	REGR factor score 2 for analysis 2	REGR factor score 3 for analysis 2	F1	F2	F3
REGR factor score 1 for analysis 1	Pearson Correlation	1	.000	.000	.091	.996**	-.052	.955**	.237	-.072
	Sig. (2-tailed)	.	1.000	1.000	.542	.000	.731	.000	.108	.630
	N	47	47	47	47	47	47	47	47	47
REGR factor score 2 for analysis 1	Pearson Correlation	.000	1	.000	.990**	.077	-.132	.276	.953**	-.129
	Sig. (2-tailed)	1.000	.	1.000	.000	.606	.378	.061	.000	.389
	N	47	47	47	47	47	47	47	47	47
REGR factor score 3 for analysis 1	Pearson Correlation	.000	.000	1	-.103	-.034	.990**	-.081	-.126	.987**
	Sig. (2-tailed)	1.000	1.000	.	.490	.821	.000	.588	.398	.000
	N	47	47	47	47	47	47	47	47	47
REGR factor score 1 for analysis 2	Pearson Correlation	.091	.990**	-.103	1	.171	-.237	.369*	.979**	-.236
	Sig. (2-tailed)	.542	.000	.490	.	.251	.108	.011	.000	.110
	N	47	47	47	47	47	47	47	47	47
REGR factor score 2 for analysis 2	Pearson Correlation	.996**	.077	-.034	.171	1	-.095	.976**	.314*	-.115
	Sig. (2-tailed)	.000	.606	.821	.251	.	.524	.000	.031	.440
	N	47	47	47	47	47	47	47	47	47
REGR factor score 3 for analysis 2	Pearson Correlation	-.052	-.132	.990**	-.237	-.095	1	-.166	-.263	.998**
	Sig. (2-tailed)	.731	.378	.000	.108	.524	.	.265	.075	.000
	N	47	47	47	47	47	47	47	47	47
F1	Pearson Correlation	.955**	.276	-.081	.369*	.976**	-.166	1	.506**	-.184
	Sig. (2-tailed)	.000	.061	.588	.011	.000	.265	.	.000	.214
	N	47	47	47	47	47	47	47	47	47
F2	Pearson Correlation	.237	.953**	-.126	.979**	.314*	-.263	.506**	1	-.269
	Sig. (2-tailed)	.108	.000	.398	.000	.031	.075	.000	.	.067
	N	47	47	47	47	47	47	47	47	47
F3	Pearson Correlation	-.072	-.129	.987**	-.236	-.115	.998**	-.184	-.269	1
	Sig. (2-tailed)	.630	.389	.000	.110	.440	.000	.214	.067	.
	N	47	47	47	47	47	47	47	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Proper varimax factors

Proper direct oblimin factors (delta = 0)

2 & 3 "flip"

Improper factors

Things to notice:

- The two sets of proper factors are highly correlated
- Improper factors are highly correlated with the proper factors
- Much more correlation among the improper factors (especially the two that share the multivocal item)
  - But remember that r = .506 means they share just 25.6% of their variance (r^2), which isn't "excessive"