

## GVPT 722: Factor Analysis in Stata

### Example of a single underlying variable: religious commitment (2000 NES)

(1) Correlation matrix:

```
. corr prayer chattend guidance bibread  
(obs=1712)
```

	prayer	chattend	guidance	bibread
prayer	1.0000			
chattend	0.5605	1.0000		
guidance	0.6682	0.5907	1.0000	
bibread	0.5822	0.5876	0.5532	1.0000

(2) Factor analysis, with principal components factors

```
. factor guidance prayer chattend bibread, pcf  
(obs=1712)
```

(principal component factors; 1 factor retained)				
Factor	Eigenvalue	Difference	Proportion	Cumulative
1	2.77196	2.28764	0.6930	0.6930
2	0.48432	0.06267	0.1211	0.8141
3	0.42164	0.09956	0.1054	0.9195
4	0.32208	.	0.0805	1.0000

Factor Loadings		
Variable	1	Uniqueness
guidance	0.84722	0.28222
prayer	0.84675	0.28301
chattend	0.82049	0.32679
bibread	0.81484	0.33603

(3) Creating a measure of religious commitment with a factor score:

```
. score commitfac  
      (based on unrotated factors)  
      Scoring Coefficients
```

Variable	1
guidance	0.30564
prayer	0.30547
chattend	0.29600
bibread	0.29396

```
. summ commitfac
```

Variable	Obs	Mean	Std. Dev.	Min	Max
commitfac	1712	-2.27e-09	1	-1.61958	1.904733

(4) Regression model with the commitment factor score:

```
. reg bushft partyid ideol7b educ income south race2 age sex commitfac, beta
```

Source	SS	df	MS	Number of obs = 791	
Model	165477.859	9	18386.4288	F( 9, 781) =	45.98
Residual	312335.494	781	399.917405	Prob > F =	0.0000
				R-squared =	0.3463
				Adj R-squared =	0.3388
				Root MSE =	19.998
Total	477813.353	790	604.827029		

  

bushft	Coef.	Std. Err.	t	P> t	Beta
partyid	32.78999	2.494009	13.15	0.000	.4458465
ideol7b	2.539132	.5567003	4.56	0.000	.1565326
educ	-1.247797	.5151357	-2.42	0.016	-.0805629
income	.5266452	.2214957	2.38	0.018	.0796824
south	2.559464	1.57839	1.62	0.105	.0490129
race2	-1.41438	1.836875	-0.77	0.442	-.024716
age	.032867	.0436662	0.75	0.452	.0227412
sex	1.515057	1.460287	1.04	0.300	.03073
commitfac	3.376506	.8032944	4.20	0.000	.1367376
_cons	30.58481	3.916188	7.81	0.000	.

**Example of two underlying factors: attitudes toward social welfare and abortion (2004 NES)**

(5) Correlation matrix:

```
. corr govjob govserv hlthinsr abortreverse partialbirth govtfundabor
(obs=755)
```

	govjob	govserv	hlthinsr	abortreverse	partialbirth	govtfundabor
govjob	1.0000					
govserv	0.4299	1.0000				
hlthinsr	0.4940	0.4252	1.0000			
abortreverse	0.1437	0.1651	0.1172	1.0000		
partialbirth	0.1668	0.1505	0.1315	0.3693	1.0000	
govtfundabor	0.2396	0.2047	0.2382	0.5314	0.4165	1.0000

(6) Factor analysis, with principal components factors

```
. factor govjob govserv hlthinsr abortion partialbirth govtfundabor, pcf
(obs=755)
```

(principal component factors; 2 factors retained)				
Factor	Eigenvalue	Difference	Proportion	Cumulative
1	2.41609	1.04121	0.4027	0.4027
2	1.37488	0.71944	0.2291	0.6318
3	0.65544	0.05281	0.1092	0.7411
4	0.60264	0.09566	0.1004	0.8415
5	0.50698	0.06301	0.0845	0.9260
6	0.44397	.	0.0740	1.0000

  

Factor Loadings			
Variable	1	2	Uniqueness
govjob	0.65969	-0.46846	0.34535
govserv	0.62459	-0.43925	0.41695
hlthinsr	0.63876	-0.50245	0.33954
abortion	0.60463	0.54909	0.33293
partialbirth	0.56793	0.46597	0.46033
govtfundabor	0.70332	0.43750	0.31394

(7) Rotation (varimax = orthogonal)

. rotate

(varimax rotation)			
Rotated Factor Loadings			
Variable	1	2	Uniqueness
-----+-----			
govjob	0.79942	0.12479	0.34535
govserv	0.75389	0.12122	0.41695
hlthinsr	0.80814	0.08584	0.33954
abortion	0.04992	0.81522	0.33293
partialbirth	0.08163	0.73007	0.46033
govtfundabor	0.19848	0.80416	0.31394

(8) Factor analyzing social welfare attitudes and abortion attitudes separately to create factor scores

. factor govjob govserv hlthinsr, pcf  
(obs=939)

(principal component factors; 1 factor retained)				
Factor	Eigenvalue	Difference	Proportion	Cumulative
-----+-----				
1	1.91367	1.31156	0.6379	0.6379
2	0.60211	0.11788	0.2007	0.8386
3	0.48423	.	0.1614	1.0000

Factor Loadings		
Variable	1	Uniqueness
-----+-----		
govjob	0.81266	0.33959
govserv	0.76233	0.41886
hlthinsr	0.81983	0.32788

. score swfac

(based on unrotated factors)

Scoring Coefficients	
Variable	1
-----+-----	
govjob	0.42466
govserv	0.39836
hlthinsr	0.42841

. factor abortion partialbirth govtfundabor, pcf  
(obs=954)

(principal component factors; 1 factor retained)				
Factor	Eigenvalue	Difference	Proportion	Cumulative
-----+-----				
1	1.83285	1.12332	0.6110	0.6110
2	0.70953	0.25192	0.2365	0.8475
3	0.45761	.	0.1525	1.0000

Factor Loadings		
Variable	1	Uniqueness
-----+-----		
abortion	0.80376	0.35397
partialbirth	0.69538	0.51645
govtfundabor	0.83862	0.29672

. score abortionfac

(based on unrotated factors)

Scoring Coefficients	
Variable	1
-----+-----	
abortion	0.43853
partialbirth	0.37940
govtfundabor	0.45755