

Multivariate Analysis

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Abstract

Introduction

Methodology

```
Kaiser-Meyer-Olkin factor adequacy
Call: KMO(r = scaled_data)
Overall MSA = 0.86
MSA for each item =
trstprl trstlgl trstplt trstprt trstep trstun imbgeco imueclt imwbcnt
imsmetn
0.92 0.93 0.82 0.83 0.86 0.85 0.93 0.90 0.89
0.90
imdfetn impcntr eqwrkbg eqpolbg eqmgmbg eqpaybg
0.83 0.87 0.91 0.79 0.77 0.89
```

After executing the Kaiser-Meyer-Olkin test, the MSA (measure of sampling accuracy, which varies between 0 and 1) is calculated as 0.86. This is classified as “meritorious”, so we have an indication that factor analysis is suitable for this data set.

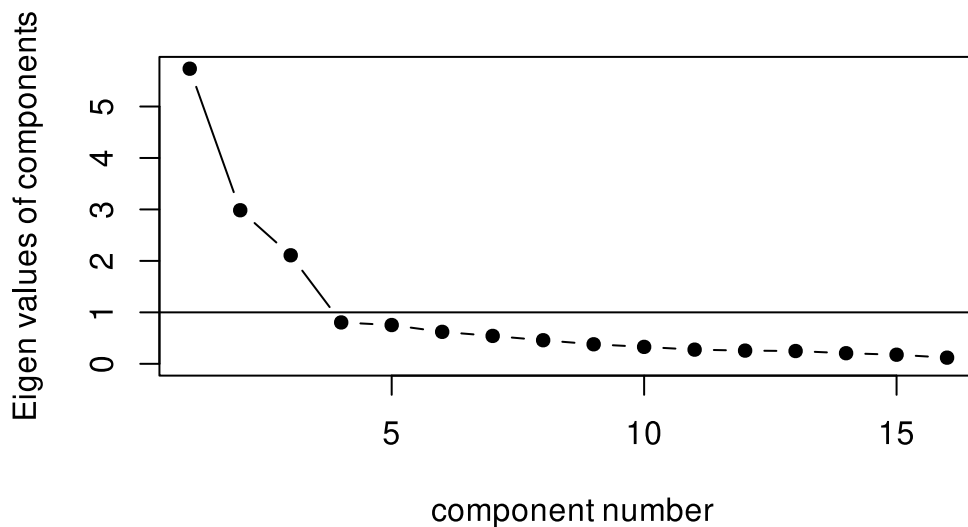
We’ll start by performing factor analysis with a high number of values:

	RC2	RC3	RC4	RC5	RC9	RC6	RC10	RC7	RC12
SS loadings	2.667	1.908	1.859	1.090	1.046	1.003	0.977	0.964	0.932
Proportion Var	0.167	0.119	0.116	0.068	0.065	0.063	0.061	0.060	0.058
Cumulative Var	0.167	0.286	0.402	0.470	0.536	0.598	0.659	0.720	0.778
Proportion Explained	0.167	0.119	0.116	0.068	0.065	0.063	0.061	0.060	0.058
Cumulative Proportion	0.167	0.286	0.402	0.470	0.536	0.598	0.659	0.720	0.778
	RC8	RC1	RC13	RC11	RC15	RC14	RC16		
SS loadings	0.913	0.910	0.710	0.461	0.231	0.210	0.120		
Proportion Var	0.057	0.057	0.044	0.029	0.014	0.013	0.008		

Cumulative Var	0.835	0.892	0.936	0.965	0.979	0.992	1.000
Proportion Explained	0.057	0.057	0.044	0.029	0.014	0.013	0.008
Cumulative Proportion	0.835	0.892	0.936	0.965	0.979	0.992	1.000

	MR4	MR1	MR2	MR3	MR5	MR6	MR7	MR8	MR9
SS loadings	2.152	2.122	1.806	1.632	1.511	1.315	0.948	0.085	0.063
Proportion Var	0.135	0.133	0.113	0.102	0.094	0.082	0.059	0.005	0.004
Cumulative Var	0.135	0.267	0.380	0.482	0.576	0.659	0.718	0.723	0.727
Proportion Explained	0.182	0.180	0.153	0.138	0.128	0.111	0.080	0.007	0.005
Cumulative Proportion	0.182	0.362	0.515	0.653	0.781	0.893	0.973	0.980	0.985
	MR11	MR10	MR12	MR15	MR13	MR14	MR16		
SS loadings	0.061	0.047	0.025	0.018	0.013	0.009	0.000		
Proportion Var	0.004	0.003	0.002	0.001	0.001	0.001	0.000		
Cumulative Var	0.731	0.734	0.735	0.737	0.737	0.738	0.738		
Proportion Explained	0.005	0.004	0.002	0.002	0.001	0.001	0.000		
Cumulative Proportion	0.990	0.994	0.997	0.998	0.999	1.000	1.000		

Scree plot



```
pcf_varimax <- principal(scaled_data, nfactors = 3, rotate = "varimax", scores = TRUE)
pcf_quartimax <- principal(scaled_data, nfactors = 3, rotate = "quartimax")
paf_varimax <- fa(scaled_data, nfactors = 3, rotate = "varimax")
paf_quartimax <- fa(scaled_data, nfactors = 3, rotate = "quartimax")
print(pcf_varimax$loadings, cutoff = 0.6, digits = 3)
```

Loadings:

	RC2	RC1	RC3
trstprl	0.846		
trstlgl	0.742		
trstplt	0.885		
trstprt	0.878		
trstep	0.773		
trstun	0.725		
imbgeco		0.770	
imueclt		0.770	
imwbcnt		0.775	
imsmetn		0.766	
imdfetn		0.862	
impcntr		0.830	
eqwrkbg			0.703
eqpolbg			0.853
eqmgmbg			0.872
eqpaybg			0.789
	RC2	RC1	RC3
SS loadings	4.129	3.980	2.719
Proportion Var	0.258	0.249	0.170
Cumulative Var	0.258	0.507	0.677

```
print(pcf_quartimax$loadings, cutoff = 0.6, digits = 3)
```

Loadings:

	RC2	RC1	RC3
trstprl	0.846		
trstlgl	0.742		
trstplt	0.885		
trstprt	0.878		
trstep	0.773		
trstun	0.725		
imbgeco		0.772	
imueclt		0.772	
imwbcnt		0.777	
imsmetn		0.768	
imdfetn		0.865	
impcntr		0.832	
eqwrkbg			0.702
eqpolbg			0.850
eqmgmbg			0.869
eqpaybg			0.786

	RC2	RC1	RC3
SS loadings	4.130	4.017	2.681
Proportion Var	0.258	0.251	0.168
Cumulative Var	0.258	0.509	0.677

```
print(paf_varimax$loadings, cutoff = 0.6, digits = 3)
```

Loadings:

	MR2	MR1	MR3
trstprl	0.819		
trstlgl	0.670		
trstplt	0.879		
trstprt	0.867		
trstep	0.717		
trstun	0.656		
imbgeco		0.720	
imueclt		0.724	
imwbcnt		0.727	
imsmetn		0.694	
imdfetn		0.843	
impcntr		0.794	
eqwrkbg			
eqpolbg			0.833
eqmgmbg			0.873
eqpaybg			0.685

	MR2	MR1	MR3
SS loadings	3.780	3.580	2.364
Proportion Var	0.236	0.224	0.148
Cumulative Var	0.236	0.460	0.608

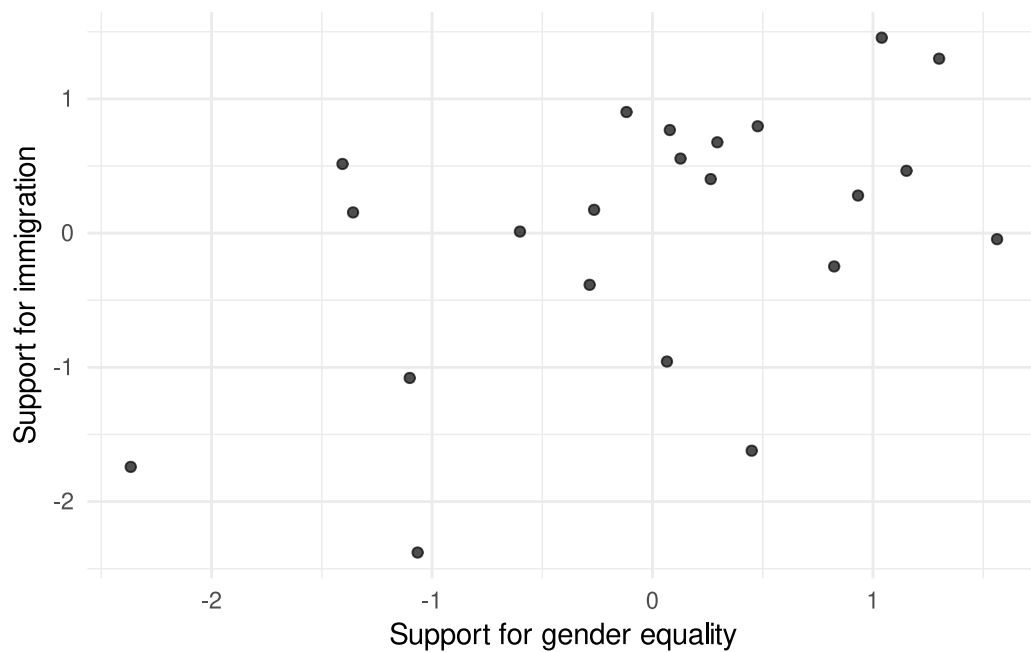
```
print(paf_quartimax$loadings, cutoff = 0.6, digits = 3)
```

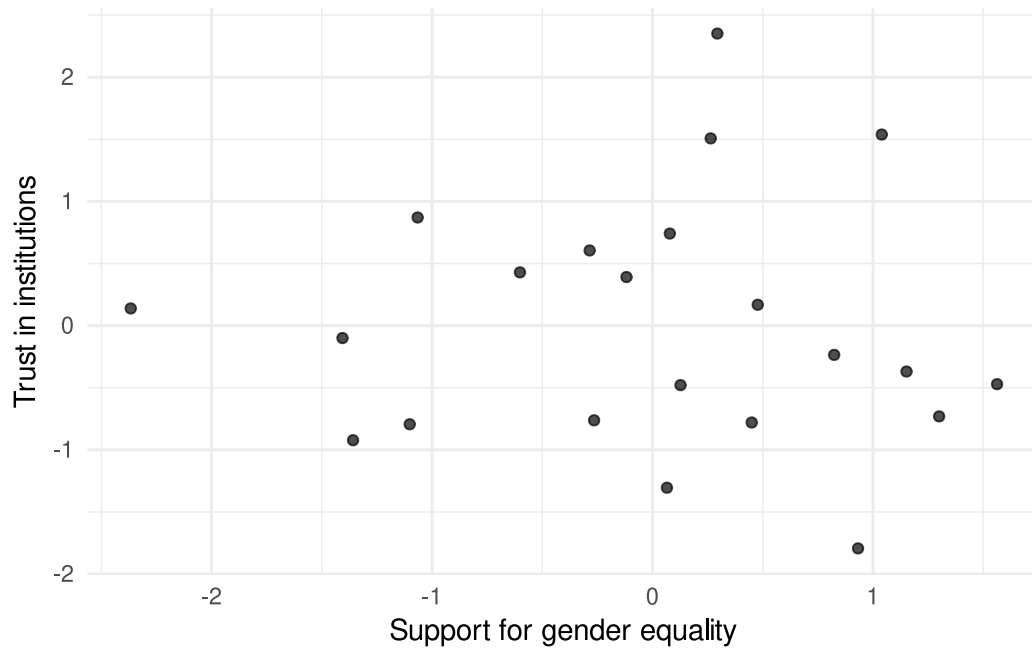
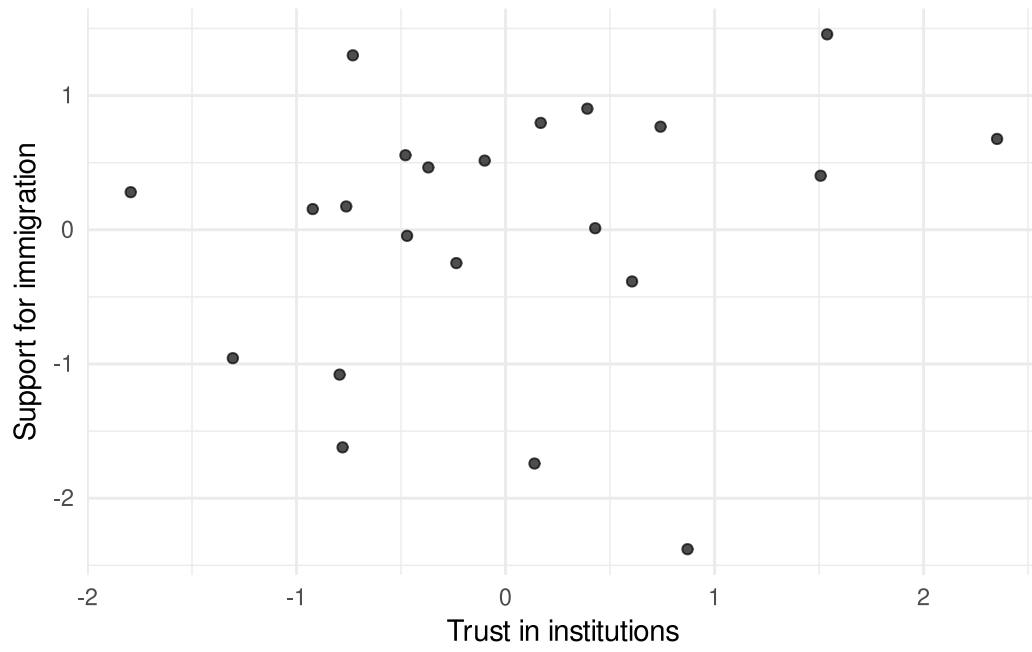
Loadings:

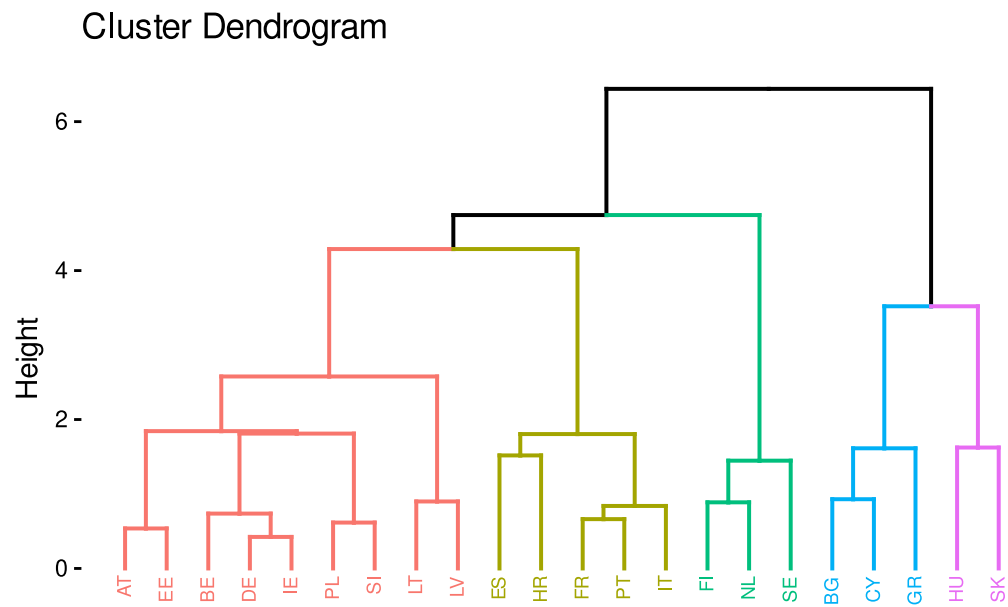
	MR2	MR1	MR3
trstprl	0.819		
trstlgl	0.670		
trstplt	0.879		
trstprt	0.867		
trstep	0.717		
trstun	0.655		

imbgeco	0.723		
imueclt	0.728		
imwbcnt	0.729		
imsmetn	0.697		
imdfetn	0.848		
impcntr	0.799		
eqwrkbg			
eqpolbg	0.828		
eqmgmbg	0.868		
eqpaybg	0.680		
	MR2	MR1	MR3
SS loadings	3.777	3.646	2.300
Proportion Var	0.236	0.228	0.144
Cumulative Var	0.236	0.464	0.608

Explicar porque standardizamos a média das observações para cada país .







Ver várias métricas?

Results

Discussion

Conclusions

References