STAT 530/J530
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How Many Factors?

Degrees of Freedom Limit: $s>0$ where

$$s = \frac{1}{2}(q-k)^2 - \frac{1}{2}(q+k)$$

# Factors	2	3	4	5	6
# Variables Required	5	7	8	9	11

How Many Factors?

Kaiser's Crieterion: Take as many factors as there are eigenvalues > 1.

Scree Plot: Take the number of factors corresponding to the last eigenvalue before they start to level off.

Model Fits

Several significant loadings for each factor.

Significant Loadings?

Judging loadings:

±0.3 Minimal

±0.4 More Important

±0.5 Practically Significant

Statisitcal Significance Rule of Thumb:

n	50	100	200	300	600	1000
λ	0.722	0.512	0.384	0.298	0.210	0.162

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Several?

Rule of Thumb:

A factor is reliable if it has

    3 or more loadings of 0.8

    4 or more of 0.6

    10 or more of 0.4 if $n \geq 150$

    Fewer loadings require n ≥ 300

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Rotations

Orthogonal rotations are those that keep the factors orthogonal (perpendictular)

Varimax – Maximizes the sum of the variances of the squared loadings within columns. This tends to force each variable to load highly on as few factors as possible.

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