

Review of Factor Analysis

1

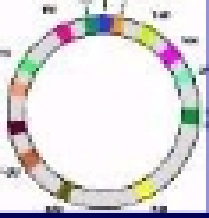
$$Y = E[Y] + l F + e$$

where

l = factor_loadings

p = # responses

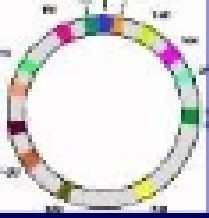
m = # factors_indicated_by F



Assumptions

$$E[F] = 0, \text{Cov}[F] = \begin{bmatrix} ? & ? & ? & ? & ? \\ ? & ? & ? & ? & ? \\ ? & ? & ? & ? & ? \\ ? & ? & ? & ? & ? \\ ? & ? & ? & ? & ? \end{bmatrix} \quad \text{O} \quad \begin{bmatrix} 0 & ? \\ ? & ? \\ ? & ? \\ ? & ? \\ 1 & ? \end{bmatrix}$$

$$E[e] = 0, \text{Cov}[e] = \begin{bmatrix} ? & ? & ? & ? & ? \\ ? & ? & ? & ? & ? \\ ? & ? & ? & ? & ? \\ ? & ? & ? & ? & ? \\ ? & ? & ? & ? & ? \end{bmatrix} \quad \text{O} \quad \begin{bmatrix} 0 & ? \\ ? & ? \\ ? & ? \\ ? & ? \\ y_p & ? \end{bmatrix}$$



covariances

$$\text{cov}[Y] = I I' + \begin{matrix} \text{?} \\ \text{?} \\ \text{?} \\ \text{?} \\ \text{?} \end{matrix} \begin{matrix} 1 \\ 0 \\ 0 \\ 0 \\ 0 \end{matrix} \begin{matrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{matrix} \begin{matrix} y_p \\ y_p \\ y_p \\ y_p \\ y_p \end{matrix}$$

$$\text{cov}[Y, F] = I$$