

En resumen

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$$X_j = a_{j1} F_1 + \dots + a_{ji} F_i + \dots + a_{jm} F_m + \epsilon_j$$

Diagram illustrating the factor analysis model structure:

- Factores comunes** (Common factors): F_1, F_i, F_m
- Factores específicos** (Specific factors): ϵ_j
- Cargas factoriales** (Factor loadings): a_{j1}, a_{ji}, a_{jm}
- Handwritten note: $\text{Cor}(X_j, F_i) = a_{ji}$

$$X_1 = a_{11} F_1 + \dots + a_{1i} F_i + \dots + a_{1m} F_m + \epsilon_1$$

$$X_j = a_{j1} F_1 + \dots + a_{ji} F_i + \dots + a_{jm} F_m + \epsilon_j \Rightarrow h_j^2 = \sum_{i=1}^m a_{ji}^2$$

$$X_p = a_{p1} F_1 + \dots + a_{pi} F_i + \dots + a_{pm} F_m + \epsilon_p$$

$$1 = \text{var}(X_j) = \sum_{i=1}^m a_{ji}^2 + \psi_j = h_j^2 + \psi_j$$

Diagram illustrating the decomposition of variance:

- Comunalidad:** h_j^2 (variance explained by common factors)
- Especificidad:** ψ_j (variance explained by specific factors)

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$$\text{var}(x_j) = \sum_{i=1}^m a_{ji}^2 + \psi_j$$

Varianza total

$$\sum_{i=1}^p \text{var}(X_i) = p$$

$$\begin{aligned} X_1 &= a_{11} F_1 + \dots + a_{1i} F_i + \dots + a_{1m} F_m + \epsilon_1 \\ X_j &= a_{j1} F_1 + \dots + a_{ji} F_i + \dots + a_{jm} F_m + \epsilon_j \\ X_p &= a_{p1} F_1 + \dots + a_{pi} F_i + \dots + a_{pm} F_m + \epsilon_p \end{aligned}$$

Varianza total explicada por F_i

$$\sum_{j=1}^p a_{ji}^2 = \lambda_i$$