Multilevel Models Standardized

Technical assistant

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Modelo 0: Nulo

$$\begin{aligned} \text{identification}_i &\sim N\left(\alpha_{j[i]}, \sigma^2\right) \\ \alpha_j &\sim N\left(\mu_{\alpha_j}, \sigma^2_{\alpha_j}\right), \text{ for geocodigo j} = 1, \ldots, \text{J} \end{aligned} \tag{1}$$

Modelo 1: Individual

$$\begin{aligned} \text{identification}_i &\sim N\left(\mu, \sigma^2\right) \\ \mu &= \alpha_{j[i]} + \beta_1(\text{new\_class}_1) + \beta_2(\text{new\_class}_2) + \\ &\quad \beta_3(\text{new\_class}_4) + \beta_4(\text{new\_class}_5) + \beta_5(\text{age}) + \\ &\quad \beta_6(\text{age\_sq}) + \beta_7(\text{sex}) + \beta_8(\text{homeowner}) + \\ &\quad \beta_9(\text{married}) + \beta_{10}(\text{has\_children}) \\ \alpha_j &\sim N\left(\gamma_0^\alpha + \gamma_1^\alpha(\text{pop\_density}) + \gamma_2^\alpha(\text{pct\_migrant}) + \gamma_3^\alpha(\text{insecurity}), \sigma^2_{\alpha_j}\right), \text{ for geocodigo j} = 1, \ldots, \end{aligned} \tag{2}$$

Modelo 2: Contextual

$$\begin{aligned} \text{identification}_i &\sim N\left(\mu, \sigma^2\right) \\ \mu &= \alpha_{j[i]} + \beta_1(\text{age}) + \beta_2(\text{age\_sq}) + \\ &\quad \beta_3(\text{sex}) + \beta_4(\text{homeowner}) + \beta_5(\text{married}) + \\ &\quad \beta_6(\text{has\_children}) \\ \alpha_j &\sim N\left(\gamma_0^\alpha + \gamma_1^\alpha(\text{nse\_barrio\_norm}) + \gamma_2^\alpha(\text{pop\_density}) + \gamma_3^\alpha(\text{pct\_migrant}) + \gamma_4^\alpha(\text{insecurity}), \sigma^2_{\alpha_j}\right) \end{aligned} \tag{3}$$

Modelo 3: Full

$$
\begin{aligned}
\text{identification}_i &\sim N\left(\mu, \sigma^2\right) \\
\mu &= \alpha_{j[i]} + \beta_1(\text{new\_class}_1) + \beta_2(\text{new\_class}_2) + \\
&\quad \beta_3(\text{new\_class}_4) + \beta_4(\text{new\_class}_5) + \beta_5(\text{age}) + \\
&\quad \beta_6(\text{age\_sq}) + \beta_7(\text{sex}) + \beta_8(\text{homeowner}) + \\
&\quad \beta_9(\text{married}) + \beta_{10}(\text{has\_children}) \\
\alpha_j &\sim N\left(\gamma_0^\alpha + \gamma_1^\alpha(\text{nse\_barrio\_norm}) + \gamma_2^\alpha(\text{pop\_density}) + \gamma_3^\alpha(\text{pct\_migrant}) + \gamma_4^\alpha(\text{insecurity}), \sigma^2_{\alpha_j}\right)
\end{aligned} \tag{4}
$$

Modelo 4: Interacción

$$
\begin{aligned}
\text{identification}_i &\sim N\left(\mu, \sigma^2\right) \\
\mu &= \alpha_{j[i]} + \beta_1(\text{new\_class}_1) + \beta_2(\text{new\_class}_2) + \\
&\quad \beta_3(\text{new\_class}_4) + \beta_4(\text{new\_class}_5) + \beta_5(\text{age}) + \\
&\quad \beta_6(\text{age\_sq}) + \beta_7(\text{sex}) + \beta_8(\text{homeowner}) + \\
&\quad \beta_9(\text{married}) + \beta_{10}(\text{has\_children}) \\
\alpha_j &\sim N\left(\gamma_0^\alpha + \gamma_1^\alpha(\text{nse\_barrio\_norm}) + \gamma_2^\alpha(\text{pop\_density}) + \gamma_3^\alpha(\text{pct\_migrant}) + \gamma_4^\alpha(\text{insecurity}) + \gamma_5^\alpha(
\end{aligned} \tag{5}
$$