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|---|---|
| Program: | HLM 8 Hierarchical Linear and Nonlinear Modeling |
| Authors: | Stephen Raudenbush & Richard Congdon |
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|---|---|
| Module: | HLM2.EXE (8.2.0.4) |
| Date: | 17 January 2025, Friday |
| Time: | 14:25:16 |
| License: | HLM Academic |
| Master Key: | 18ef3bb8-****-****-****-dd3f95be3e1d |
| Installation Key: | 33b8ebd5-****-****-****-303cc4207cb5 |
| Expiration: | 14/01/2026 07:34:58 |

# Specifications for this HLM2 run

Problem Title: no title

The data source for this run = Tabela3
The command file for this run = C:\Users\mckos\AppData\Local\Temp\whlmtemp.hlm
Output file name = C:\Users\mckos\Dropbox\2025\Artigos_em_andamento\DADOS\Tabela_3\hlm2.html
The maximum number of level-1 units = 34335
The maximum number of level-2 units = 540
The maximum number of iterations = 100
Method of estimation: restricted maximum likelihood

The outcome variable is PROFLPSA

## Summary of the model specified

### Step 2 model

### Level-1 Model

$$PROFLPSA_{ij} = \beta_{0j} + \beta_{1j}*(NSE1_INE_{ij}) + r_{ij}$$

### Level-2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01}*(ZINSE_j) + \gamma_{02}*(PALTAESC_j) + \gamma_{03}*(COMPLEX_j) + \gamma_{04}*(DISTFAV_j) + \gamma_{05}*(PRESPOL3_j) + u_{0j}$$

$\beta_{1j} = \gamma_{10}$

NSE1_INE has been centered around the grand mean.

ZINSE PALTAESC COMPLEX DISTFAV PRESPOL3 have been centered around the grand mean.

**Mixed Model**

$$PROFLPSA_{ij} = \gamma_{00} + \gamma_{01}*ZINSE_j + \gamma_{02}*PALTAESC_j + \gamma_{03}*COMPLEX_j + \gamma_{04}*DISTFAV_j + \gamma_{05}*PRESPOL3_j + \gamma_{10}*NSE1_INE_{ij} + u_{0j} + r_{ij}$$

# Final Results - Iteration 4

**Iterations stopped due to small change in likelihood function**

$\sigma^2 = 1906.90250$

$\tau$

INTRCPT1,$\beta_0$ 110.03381

| Random level-1 coefficient | Reliability estimate |
|---|---|
| INTRCPT1,$\beta_0$ | 0.758 |

The value of the log-likelihood function at iteration 4 = -1.787941E+05

**Final estimation of fixed effects:**

| Fixed Effect | Coefficient | Standard error | *t*-ratio | Approx. *d.f.* | *p*-value |
|---|---|---|---|---|---|
| For INTRCPT1, $\beta_0$ | | | | | |
| INTRCPT2, $\gamma_{00}$ | 213.495221 | 0.518755 | 411.553 | 534 | <0.001 |
| ZINSE, $\gamma_{01}$ | 2.012978 | 0.651395 | 3.090 | 534 | 0.002 |
| PALTAESC, $\gamma_{02}$ | 0.297046 | 0.046353 | 6.408 | 534 | <0.001 |
| COMPLEX, $\gamma_{03}$ | 0.390129 | 0.446937 | 0.873 | 534 | 0.383 |
| DISTFAV, $\gamma_{04}$ | 0.006640 | 0.001944 | 3.415 | 534 | <0.001 |
| PRESPOL3, $\gamma_{05}$ | -0.308687 | 0.163376 | -1.889 | 534 | 0.059 |
| For NSE1_INE slope, $\beta_1$ | | | | | |
| INTRCPT2, $\gamma_{10}$ | 2.033712 | 0.175243 | 11.605 | 33794 | <0.001 |

**Final estimation of fixed effects (with robust standard errors)**

| Fixed Effect | Coefficient | Standard error | *t*-ratio | Approx. *d.f.* | *p*-value |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| For INTRCPT1, $\beta_0$ | | | | | |
| INTRCPT2, $\gamma_{00}$ | 213.495221 | 0.513990 | 415.368 | 534 | <0.001 |
| ZINSE, $\gamma_{01}$ | 2.012978 | 0.714239 | 2.818 | 534 | 0.005 |
| PALTAESC, $\gamma_{02}$ | 0.297046 | 0.046855 | 6.340 | 534 | <0.001 |
| COMPLEX, $\gamma_{03}$ | 0.390129 | 0.446882 | 0.873 | 534 | 0.383 |
| DISTFAV, $\gamma_{04}$ | 0.006640 | 0.001818 | 3.653 | 534 | <0.001 |
| PRESPOL3, $\gamma_{05}$ | -0.308687 | 0.120398 | -2.564 | 534 | 0.011 |
| For NSE1_INE slope, $\beta_1$ | | | | | |
| INTRCPT2, $\gamma_{10}$ | 2.033712 | 0.193607 | 10.504 | 33794 | <0.001 |

**Final estimation of variance components**

| Random Effect | Standard Deviation | Variance Component | *d.f.* | $\chi^2$ | *p*-value |
|---|---|---|---|---|---|
| INTRCPT1, $u_0$ | 10.48970 | 110.03381 | 534 | 2512.05581 | <0.001 |
| level-1, $r$ | 43.66809 | 1906.90250 | | | |

**Statistics for current covariance components model**

Deviance = 357588.104292
Number of estimated parameters = 2