**Table 1. Correlations between the continuous predictor variables in the study.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **LlamaB** |  |  |  |  |  |  |  |  |
| **Awareness of the study aim** |  |  |  |  |  |  |  | ***r* = -.26**  ***p* = .080** |
| **Attention to rules** |  |  |  |  |  |  | ***r* = .52\*\***  ***p* < .001** | ***r* = -.10**  ***p* = .516** |
| **Knowledge of FLs** |  |  |  |  |  | ***r* = .29**  ***p* = .053** | ***r* = .16**  ***p* = .309** | ***r* = .28**  ***p* = .059** |
| **Reliance on rules (wrGJT)** |  |  |  |  | ***r* = .35\***  ***p* = .018** | ***r* = .23**  ***p* = *.*136** | ***r* = .07**  ***p* = .644** | ***r* = .17**  ***p* = .273** |
| **Working memory** |  |  |  | ***r* = .19**  ***p* = .21** | ***r* = .35\***  ***p* = .020** | ***r* = -.19**  ***p* = .215** | ***r* = -.21**  ***p* = .175** | ***r* = .49**  ***p* < .001** |
| **Language analytic skills** |  |  | ***r* = .44\*\***  ***p* = .003** | ***r* = .22**  ***p* = .149** | ***r* = .34\***  ***p* = .022** | ***r* = -.04**  ***p* = .782** | ***r* = .04**  ***p* = .789** | ***r* = .47\*\***  ***p* = .001** |
| **General IQ** |  | ***r* = .43\*\***  ***p* = .003** | ***r* = .43\*\***  ***p* = .002** | ***r* = .25**  ***p* = .096** | ***r* = .42\*\***  ***p* = .004** | ***r* = *.*09**  ***p* = *.*552** | ***r* = .06**  ***p* = .711** | ***r* = .42\*\***  ***p* = .004** |
|  | **General IQ** | **Language analytic skills** | **Working memory** | **Reliance on rules (wrGJT)** | **Knowledge of FLs** | **Attention to rules (Q5)** | **Awareness of the study aim (Q8)** | **LlamaB** |

**Supplementary model for written grammaticality judgment task prior to the exclusion of an influential cases.**

Table 2.*Fixed effects estimates in the model for the untimed written GJT.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratios | 95% CI | *z* | *p* |
| (Intercept) | 2.33 | 1.92 – 2.83 | 8.59 | **<0.001** |
| Grammaticality | 3.53 | 2.32 – 5.35 | 5.93 | **<0.001** |
| General intelligence | 1.18 | 0.94 – 1.47 | 1.45 | 0.148 |
| Language analytic ability | 1.26 | 1.02 – 1.57 | 2.10 | **0.036** |
| Working memory | 1.09 | 0.88 – 1.35 | 0.76 | 0.446 |
| Knowledge of previous languages | 1.12 | 0.90 – 1.39 | 1.04 | 0.297 |
| Reliance on rules | 1.38 | 1.13 – 1.68 | 3.19 | **0.001** |

*Note.* Number of data points = 4680 items = 104; participants = 45. The marginal R2 of the model = 0.18 and its conditional R2 = 0.26.

Table 3.*Random effects estimates in the model for the untimed written GJT.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group |  | Variance | SD | Corr |
| Subject | Intercept | 0.32 | 0.57 |  |
|  | Grammaticality | 1.29 | 1.13 |  |
| Item | Intercept | 0.10 | 0.32 |  |
|  | Grammaticality | 1.10 | 1.04 | 0.78 |
|  | Knowledge of previous languages | 0.02 | 0.15 |  |
|  | Language analytic ability | 0.03 | 0.18 |  |

**Supplementary model for written grammaticality judgment task with both essential and nonessential predictors, including interactions.**

Table 4.*Fixed effects estimates in the model for the untimed written GJT.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratios | 95% CI | *z* | *p* |
| (Intercept) | 2.36 | 1.96 – 2.83 | 9.15 | **<0.001** |
| Grammaticality | 3.47 | 2.29 – 5.25 | 5.88 | **<0.001** |
| General intelligence | 1.19 | 0.96 – 1.47 | 1.60 | 0.110 |
| Language analytic ability | 1.42 | 1.13 – 1.78 | 3.05 | **0.002** |
| Working memory | 1.09 | 0.87 – 1.36 | 0.76 | 0.446 |
| Awareness (question 5) | 1.16 | 0.93 – 1.45 | 1.35 | 0.179 |
| Awareness (question 8) | 0.83 | 0.67 – 1.04 | -1.61 | 0.108 |
| Knowledge of previous languages | 1.03 | 0.83 – 1.28 | 0.27 | 0.787 |
| Vocabulary learning aptitude | 0.96 | 0.76 – 1.20 | -0.39 | 0.695 |
| Reliance on rules | 1.42 | 1.18 – 1.72 | 3.66 | **<0.001** |
| Grammaticality x General intelligence | 1.08 | 0.71 – 1.65 | 0.36 | 0.721 |
| Grammaticality x Language analytic ability | 0.81 | 0.53 – 1.23 | -0.10 | 0.319 |
| Grammaticality x Reliance on rules | 1.01 | 0.70 – 1.47 | 0.06 | 0.953 |
| Grammaticality x Working memory | 1.33 | 0.87 – 2.02 | 1.32 | 0.187 |

*Note.* Number of data points = 4576; items = 104; participants = 44. The marginal R2 of the model = 0.20 and its conditional R2 = 0.27.

**Supplementary model for written untimed GJT with residualized ID variables**

Table 5.*Fixed effects estimates in the model for the untimed written GJT (with intact general IQ).*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratios | 95% CI | *z* | *p* |
| (Intercept) | 2.32 | 1.93 – 2.80 | 8.87 | **<0.001** |
| Grammaticality | 3.42 | 2.25 – 5.20 | 5.73 | **<0.001** |
| General intelligence | 1.41 | 1.18 – 1.69 | 3.71 | **<0.001** |
| Language analytic abilityresid | 1.35 | 1.12 – 1.63 | 3.17 | **0.002** |
| Working memoryresid | 1.19 | 0.99 – 1.43 | 1.80 | 0.071 |
| Reliance on rules | 1.46 | 1.21 – 1.75 | 4.03 | **<0.001** |

*Note.* Number of data points = 4576; items = 104; participants = 44. The marginal R2 of the model = 0.18 and its conditional R2 = 0.26.

Table 6.*Random effects estimates in the model for the untimed written GJT.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group |  | Variance | SD | Corr |
| Subject | Intercept | 0.29 | 0.54 |  |
|  | Grammaticality | 1.30 | 1.14 |  |
| Item | Intercept | 0.09 | 0.30 |  |
|  | Grammaticality | 1.07 | 1.03 | 0.73 |
|  | Language analytic abilityres | - | 0.07 |  |

Table 7.*Fixed effects estimates in the model for the untimed written GJT (with intact WMC).*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratios | 95% CI | *z* | *p* |
| (Intercept) | 2.32 | 1.93 – 2.80 | 8.87 | **<0.001** |
| Grammaticality | 3.42 | 2.25 – 5.20 | 5.73 | **<0.001** |
| General intelligence resid | 1.28 | 1.06 – 1.55 | 2.60 | **0.009** |
| Language analytic abilityresid | 1.39 | 1.15 – 1.67 | 3.39 | **0.001** |
| Working memory | 1.35 | 1.13 – 1.61 | 3.26 | **0.001** |
| Reliance on rules | 1.46 | 1.21 – 1.75 | 4.03 | **<0.001** |

*Note.* Number of data points = 4576; items = 104; participants = 44. The marginal R2 of the model = 0.18 and its conditional R2 = 0.26.

**Supplementary model for auditory grammaticality judgment task prior to the exclusion of influential cases.**

Table 8.*Fixed effects estimates in the model for the timed auditory GJT.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratios | 95% CI | *z* | *p* |
| (Intercept) | 1.49 | 1.30 – 1.70 | 5.75 | **<0.001** |
| Grammaticality | 4.27 | 3.01 – 6.05 | 8.15 | **<0.001** |
| General intelligence | 1.05 | 0.90 – 1.22 | 0.66 | 0.509 |
| Language analytic ability | 1.15 | 1.00 – 1.33 | 1.98 | **0.047** |
| Working memory | 1.06 | 0.92 – 1.22 | 0.81 | 0.419 |
| Knowledge of previous languages | 1.13 | 0.98 – 1.30 | 1.73 | 0.083 |
| Reliance on rules | 1.17 | 1.03 – 1.33 | 2.38 | **0.017** |

*Note.* Number of data points = 4680 items = 104; participants = 45. The marginal R2 of the model = 0.16 and its conditional R2 = 0.23.

Table 9.*Random effects estimates in the model for the timed auditory GJT.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group |  | Variance | SD | Corr |
| Subject | Intercept | 0.13 | 0.36 |  |
|  | Grammaticality | 0.67 | 0.82 | 0.41 |
| Item | Intercept | 0.06 | 0.24 |  |
|  | Grammaticality | 1.22 | 1.10 | 0.28 |
|  | General intelligence | 0.02 | 0.13 |  |

**The initial model for auditory timed grammaticality judgment task with both essential and nonessential predictors, including interactions.**

Table 10.*Fixed effects estimates in the model for the timed auditory GJT.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratios | 95% CI | *z* | *p* |
| (Intercept) | 1.36 | 1.27 – 1.46 | 9.060 | **<0.001** |
| Grammaticality | 3.92 | 2.81 – 5.46 | 8.051 | **<0.001** |
| General intelligence | 1.18 | 1.08 – 1.29 | 3.716 | **<0.001** |
| Language analytic ability | 1.17 | 1.07 – 1.27 | 3.502 | **<0.001** |
| Working memory | 1.05 | 0.97 – 1.15 | 1.179 | 0.238 |
| Awareness (question 5) | 0.97 | 0.89 – 1.07 | -0.566 | 0.572 |
| Awareness (question 8) | 1.06 | 0.97 – 1.15 | 1.204 | 0.228 |
| Knowledge of previous languages | 1.08 | 0.99 – 1.17 | 1.739 | 0.082 |
| Vocabulary learning aptitude | 0.95 | 0.87 – 1.04 | -1.061 | 0.289 |
| Reliance on rules | 1.09 | 1.01 – 1.17 | 2.275 | **0.023** |
| Grammaticality x General intelligence | 1.25 | 0.92 – 1.70 | 1.403 | 0.161 |
| Grammaticality x Language analytic ability | 0.80 | 0.59 – 1.08 | -1.440 | 0.150 |
| Grammaticality x Reliance on rules | 0.96 | 0.73 – 1.26 | -0.321 | 0.749 |
| Grammaticality x Working memory | 1.13 | 0.84 – 1.54 | 0.813 | 0.416 |

*Note.* Number of data points = 4472; items = 104; participants = 43. The marginal R2 of the model = 0.16.

**Supplementary model for timed grammaticality judgment task with residualized ID variables**

Table 11.*Fixed effects estimates in the model for the timed GJT (with intact general IQ).*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratios | 95% CI | *z* | *p* |
| (Intercept) | 1.40 | 1.24 – 1.58 | 5.46 | **<0.001** |
| Grammaticality | 4.10 | 2.88 – 5.83 | 7.85 | **<0.001** |
| General intelligence | 1.33 | 1.19 – 1.50 | 4.82 | **<0.001** |
| Language analytic abilityresid | 1.22 | 1.09 – 1.37 | 3.35 | **0.001** |
| Working memoryresid | 1.08 | 0.96 – 1.21 | 1.31 | 0.190 |

*Note.* Number of data points = 4472; items = 104; participants = 43. The marginal R2 of the model = 0.15 and its conditional R2 = 0.21.

Table 12.*Random effects estimates in the model for the timed GJT.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group |  | Variance | SD | Corr |
| Subject | Intercept | 0.09 | 0.30 |  |
|  | Grammaticality | 0.65 | 0.81 | 0.26 |
| Item | Intercept | 0.05 | 0.22 |  |
|  | Grammaticality | 1.26 | 1.12 | 0.25 |
|  | General intelligence | 0.02 | 0.13 |  |

Table 13.*Fixed effects estimates in the model for the timed GJT (with intact working memory capacity).*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Odds Ratios | 95% CI | *z* | *p* |
| (Intercept) | 1.40 | 1.24 – 1.58 | 5.46 | **<0.001** |
| Grammaticality | 4.10 | 2.88 – 5.83 | 7.85 | **<0.001** |
| General intelligenceresid | 1.26 | 1.12 – 1.41 | 3.76 | **<0.001** |
| Language analytic abilityresid | 1.27 | 1.13 – 1.42 | 4.02 | **<0.001** |
| Working memory | 1.22 | 1.09 – 1.37 | 3.50 | **<0.001** |

*Note.* Number of data points = 4472; items = 104; participants = 43. The marginal R2 of the model = 0.15 and its conditional R2 = 0.21.