S1 Power Analysis

Used following version of G\*Power



Used R^2 values from Darcy et al. (2016) hierarchical multiple regressions.



**Test for ABX z score**

1. Open G\*Power
2. Select F tests
3. Select Linear Multiple Regression: Fixed model, R^2 increase
4. Set power to .80
5. Set Total number of predictors to 2
6. Click Determine
7. For Variance explained by special effect, input .18 (from ABX z score above)
8. For Residual variance, input .82 (1-.18)
9. Click calculate and transfer to main window
10. Click calculate (on main window)
11. This results in a sample size of n=48



**Test for ABX error rate (vowels)**

1. Open G\*Power
2. Select F tests
3. Select Linear Multiple Regression: Fixed model, R^2 increase
4. Set power to .80
5. Set Total number of predictors to 2
6. Click Determine
7. For Variance explained by special effect, input .14 (from ABX error rate [vowels])
8. For Residual variance, input .82 (1-.18)
9. Click calculate and transfer to main window
10. Click calculate (on main window)
11. This results in a sample size of n=60



S2 Partial Correlation Test Assumptions

**Figure S2-1**

*Histograms for Raw and Log-transformed Perception Effects*



**Figure S2-2**

*Histograms for Raw and Log-transformed Production Effects*

**

**Figure S2-3**

*QQ plots for Raw and Log-transformed Perception Effects*

**

**Figure S2-4**

*QQ plots for Raw and Log-transformed Production Effects*



**Figure S2-5**

*QQ plots for Xlex and Inhibition Variables*

**

**Figure S2-6**

*Histograms for Xlex and Inhibition Variables*



**Table S2-1**

*Shapiro-Wilk Tests of Normality*

|  |  |
| --- | --- |
|  | Shapiro-Wilk |
| ABX error (vowel) | *W* = 0.92, *p* < .001\* |
| Log ABX error (Vowel) | *W* = 0.94, *p* = .008\* |
| ABX error (consonant) | *W* = 0.91, *p* < .001\* |
| Log ABX error (consonant) | *W* = 0.93, *p* = .002\* |
| Consonant production | *W* = 0.92, *p* < .001\* |
| Log consonant production | *W* = 0.76, *p* < .001\* |
| Vowel production | *W* = 0.91, *p* < .001\* |
| Log vowel production | *W* = 0.98, *p* = .584 |
| Inhibition (retrieval-induced) | *W* = 0.97, *p* = .251 |
| Log Simon | *W* = 0.98, *p* = .555 |
| Log Stroop | *W* = 0.99, *p* = .827 |
| Xlex | *W* = 0.99, *p* = .947 |
| ABX error (vowel) | 0.918 |

The following tables report the results of the Pearson partial correlation analyses. As some test assumptions were violated, Spearman partial correlation analyses are reported. For interested readers, the results of the Pearson partial correlation analyses are reported here but must be interpreted with caution as assumptions were violated.

**Table S2-2**

*Partial Correlations (Pearson) between Phonological Variables and the Three Measures of Inhibition*

|  |  |  |  |
| --- | --- | --- | --- |
|  | Retrieval-induced | Simon | Stroop |
| ABX error (vowels) | –0.15 [–0.39, 0.11] | –0.16 [–0.40, 0.10] | 0.17 [–0.09, 0.41] |
| ABX error (consonants) | –0.10 [–0.35, 0.16] | 0.03 [–0.23, 0.29] | 0.19 [–0.07, 0.43] |
| Vowel production *z* score | 0.14 [–0.13, 0.38] | –0.22 [–0.45, 0.04] | 0.14 [–0.12, 0.39] |
| Consonant production (max. 8) | 0.10 [–0.16, 0.35] | 0.05 [–0.21, 0.30] | 0.00 [–0.25, 0.26] |

S3 Testing Simon and Stroop Effect Normality

**Figure S3-1**

*Histograms and QQ plots for Raw Simon Effects*

**

**Figure S3-2**

*Histograms and QQ plots for Log-transformed Simon Effects*

**

**Figure S3-3**

*Histograms and QQ plots for Raw Stroop Effects*

**

**Figure S3-4**

*Histograms and QQ plots for Log-transformed Stroop Effects*



**Table S3**

*Shapiro-Wilk Tests of Normality*

|  |  |
| --- | --- |
|  | Shapiro-Wilk |
| Raw Simon Effects | *W* = 0.87, *p* < .001\* |
| Log-transformed Simon Effects | *W* = 0.98, *p <* .555 |
| Raw Stroop Effects | *W* = 0.88, *p* < .001\* |
| Log-transformed Stroop Effects | *W* = 0.99, *p <* .827 |

S4 Comparison of Means and SDs of Target Cognitive and Phonological VariablesUsing Hedge’s *g* Effect Sizes

**Table S4**

*Means and SDs of Target Cognitive and Phonological Variables in DM&D (2016) and the Current Replication*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Darcy et al.L2 Spanish (*n*=18) | Darcy et al.All learners (*n*=34) | Current StudyL2 Spanish (*n*=58) | Effect SizeHedge’s *g* | Effect SizeHedge’s *g* |  |
| Retrieval-induced inhibition | 1.01 (0.11) | 1.03 (0.21) | 1.02 (0.23) | –0.05 [–0.58, 0.48] | 0.04 [–0.38, 0.47] |  |
| ABX error (vowels) | 0.20 (0.14) | 0.24 (0.14) | 19.2 (13.2) | 0.06 [–0.47, 0.59] | 0.35 [–0.07, 0.78] |  |
| ABX error (consonants) | n/a | n/a | 16.8 (14.0) |  |  |  |
| Vowel production *z* score | –2.54 (0.78) | –3.08 (0.86) | –2.27 (0.85) | –0.32 [–0.85, 0.21] | –0.94 [–1.39, –0.50] |  |
| Consonant production (max. 8) | 4.09 (2.45) | 5.41 (2.42) | 4.50 (2.31) | –0.17 [–0.70, 0.36] | 0.38 [–0.04, 0.81] |  |