**Table S5.** Multivariate Model-Fitting Results (best-fitting model in **bold,** parameter estimates shown for best-fitting model) for Latin Square, N-term, and Sentence Tasks.

| Model[a] | -2 log likelihood | df | AIC |
|---|---|---|---|
| 1. Cholesky ACE | 6051.391 | 2331 | 1389.4 |
| **2. Cholesky AE** | **6052.943** | **2337** | **1378.9** |
| 3. Cholesky CE | 6075.994 | 2337 | 1402.0 |
| 4. Independent Pathway: 1xA Factor plus Specifics, Cholesky E | 6056.261 | 2237 | 1382.3 |
| 5. Common Pathway: 1 Common Factor, plus specifics | 6057.401 | 2339 | 1379.4 |

| | Cholesky AE Model Parameters (shown as a %) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Additive Genetic Factors[b] | | | Total A | Unshared Environmental Factors[b] | | | |
| | A1 | A2 | A3 | ($h^2$) | E1 | E2 | E3 | Total E |
| Sentence | 55 (45-64) | - | - | 55 | 45 (36-55) | - | - | 45 |
| N-term | 40 (29-51) | 11 (03-21) | - | 51 | 02 (0.1-05) | 47 (39-56) | - | 49 |
| Latin Square | 18 (05-29) | 23 (07-36) | 01 (00-18) | 43 | 01 (00-04) | 00 (00-0.1) | 56 (46-67) | 57 |

[a]The significance of additive genetic (A) and common environmental (C) influences were tested in a Cholesky model. While C could be dropped from the fully-saturated model without loss of fit ($\Delta\chi^2_6 = 1.6$; Model 2), dropping A resulted in a significant worsening of fit ($\Delta\chi^2_6 = 24.6$; Model 3). Therefore, a Cholesky model allowing for A and E, but not C influences (i.e. Model 2) was the most parsimonious and best-fitting Cholesky model. Retaining the AE format, independent and common pathway models were compared to the best-fitting Cholesky model. The AE Cholesky remained the best-fitting, although the fit of the common pathway model was almost identical (AIC = 1378.9 vs. 1379.4), and consequently, estimates are shown for both models (Cholesky in this Table and the common pathway, which is considered a more interpretable model [1], in Figure 2.
[b]Cholesky estimates on the diagonal include both common and specific influences (A1, A2, E1, E2) or specific influences only (A3, E3). Estimates on the off-diagonal represent common influences

## References

1. Loehlin JC (1996) The Cholesky approach: A cautionary note. Behavior Genetics 26: 65-69.