Supporting Information for

**Reply to Koplenig & Wolfer: Global language analyses must properly account for relationships and location**

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Table S1. Test for residual autocorrelation before and after including the selected eigenvector.

Table S2. Coefficients and standard errors of the first 5 selected eigenvectors.

Table S1. Test for residual autocorrelation before and after including the selected eigenvector. P-value is included in the parenthesis after the Moran’s coefficient. Cliff and Ord’s formula is used in spfilteR (8) and described in (11).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Polysynthesis | | Extended | |
|  | Before | After | Before | After |
| General formula  with extension | 30128.8  (<0.001) | 0.000  (>0.999) | 26303.03  (<0.001) | 0.000  (>0.999) |
|  |  |  |  |  |
| Cliff and Ord’s formula without extension | 36059.3  (<0.001) | 0.006  (>0.999) | 31624.54  (<0.001) | 0.006  (>0.999) |

Table S2. Coefficients and standard errors of the first 5 selected eigenvectors. Including many predictors causes separation in probit or logistic regression, which happens when a combination of predictors can perfectly separate 0 from 1 in the response variable. Separation problem is identifiable by inflated standard errors of the coefficients of some eigenvectors. This will cause unreliable estimates and model convergence problem when we include these eigenvectors to test the significance of predictors.

|  |  |  |
| --- | --- | --- |
|  | Coefficient | S.E. |
| EV 1 | -2.7 | 0.20 |
| EV 2 | 7.7×105 | 2.02×105 |
| EV 3 | -2.0×102 | 42.23 |
| EV 4 | 1.6×102 | 53.65 |
| EV 5 | 7.7×102 | 2.52×102 |
| … | … | … |