**Supplementary Materials.**

Table S1.

Spin correlation between gradients estimated by traditional connectivity using resting state data and informational connectivity using semantic and chevron neural responses in each hemisphere.

|  |  |  |
| --- | --- | --- |
|   |   | Semantic Task |
|   |   | Left Hemisphere | Right Hemisphere |
|   |   | Gradient 1 | Gradient 2 | Gradient 3 | Gradient 1 | Gradient 2 | Gradient 3 |
| Resting | Gradient 1 | 0.867\*\*\* |   |   | 0.874\*\*\* |   |   |
| Gradient 2 |   | 0.421\*\*\* |   |   | 0.439\*\*\* |   |
| Gradient 3 |   |   | 0.419\*\*\* |   |   | -0.708\*\*\* |
|   |   | Chevron Task |
|   |   | Left Hemisphere | Right Hemisphere |
|   |   | Gradient 1 | Gradient 2 | Gradient 3 | Gradient 1 | Gradient 2 | Gradient 3 |
| Resting | Gradient 1 | 0.803\*\*\* |   |   | 0.806\*\*\* |   |   |
| Gradient 2 |   | 0.261\*\*\* |   |   | 0.246\*\*\* |   |
| Gradient 3 |   |   |  -0.060\*\*\* |   |   |  -0.833\*\*\* |

Gradients 1 and 2 showed similar spatial patterns when derived from informational connectivity metrics in the semantic and chevron tasks and from resting state data. However, gradient 3 showed a task-specific state which captured the separation of left hemisphere from right hemisphere for the semantic task.