**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.