

Supplementary Materials

Additional Simulation Results

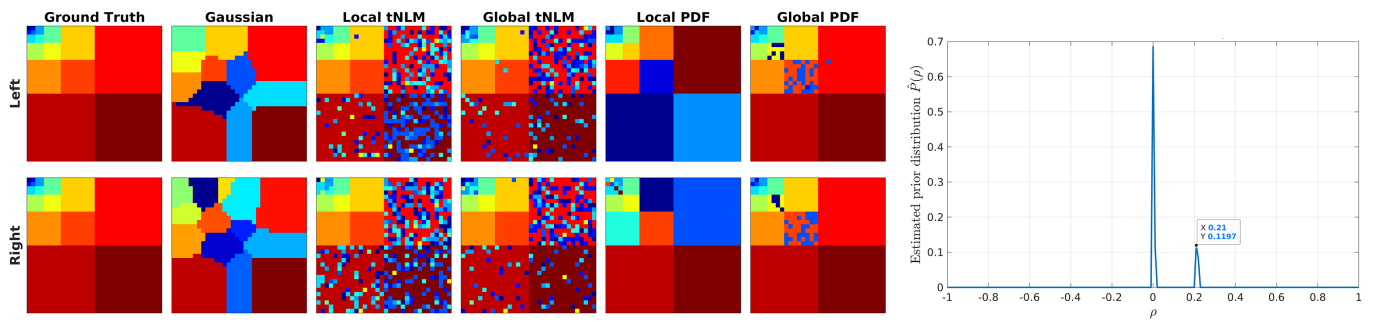


Figure S1: Simulation results with partial correlation $c = 0.75, \rho = 0.214$.

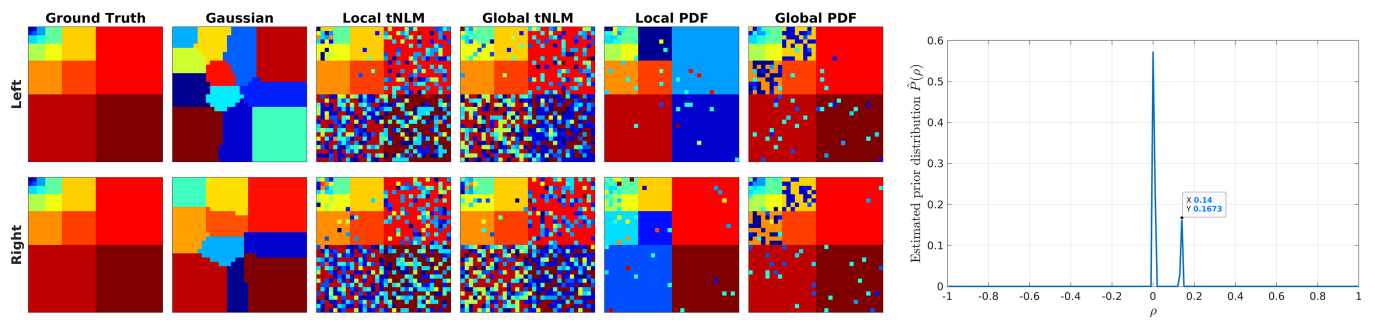


Figure S2: Simulation results with partial correlation $c = 0.5, \rho = 0.143$.

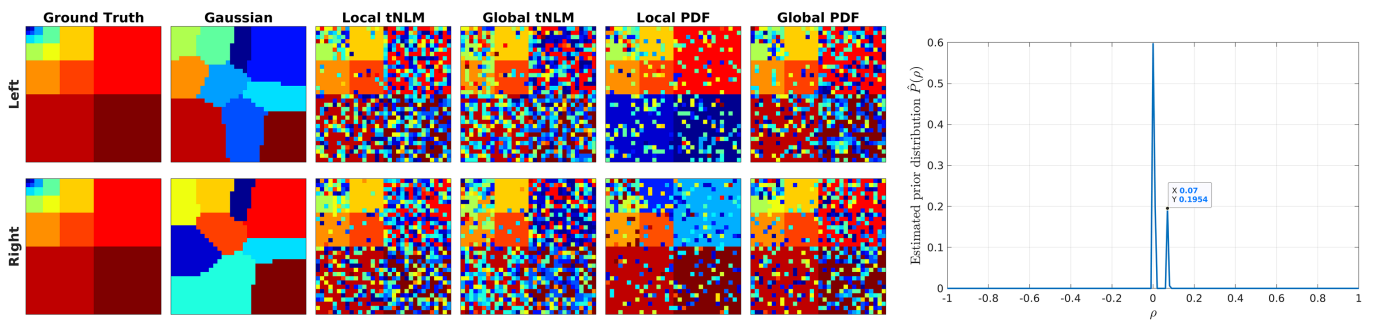


Figure S3: Simulation results with partial correlation $c = 0.25, \rho = 0.071$.

Additional Seeded Correlation Results

Motor Network

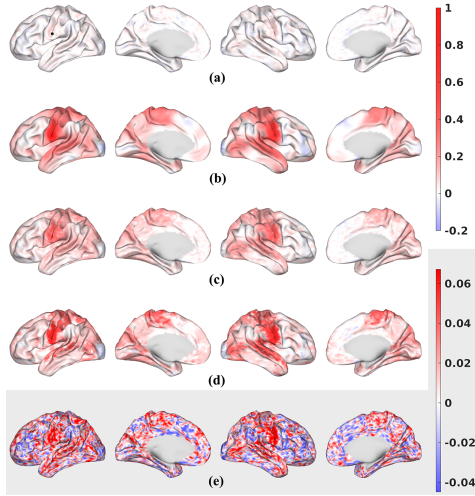


Figure S4: Seeded correlation maps. The seed was placed on the left somato-motor cortex near the face area.

Auditory Network

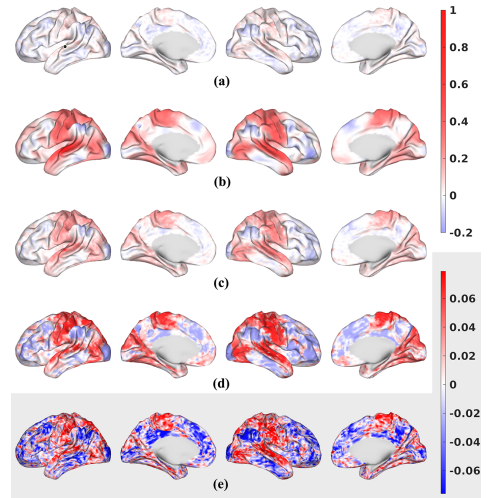


Figure S6: Seeded correlation maps. The seed was placed on the left auditory cortex.

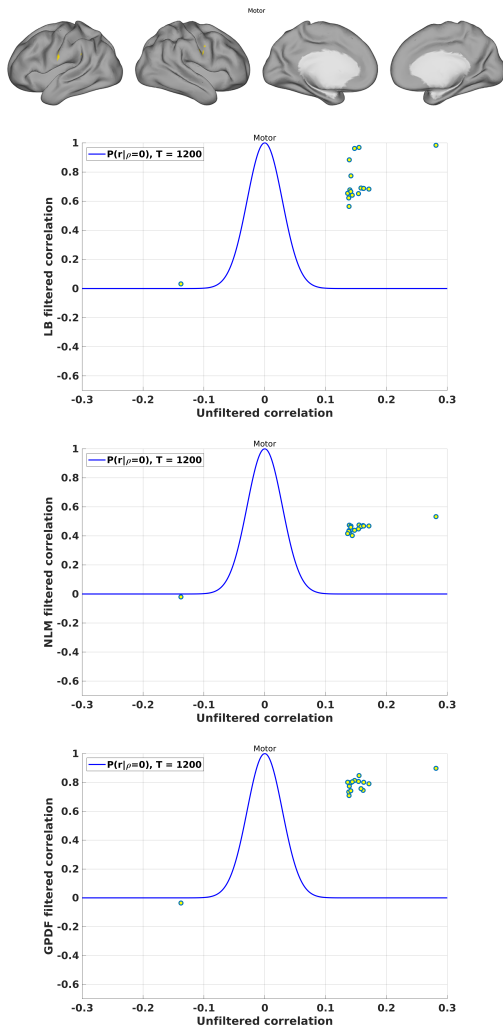


Figure S5: Scatter plots of the high correlation values.

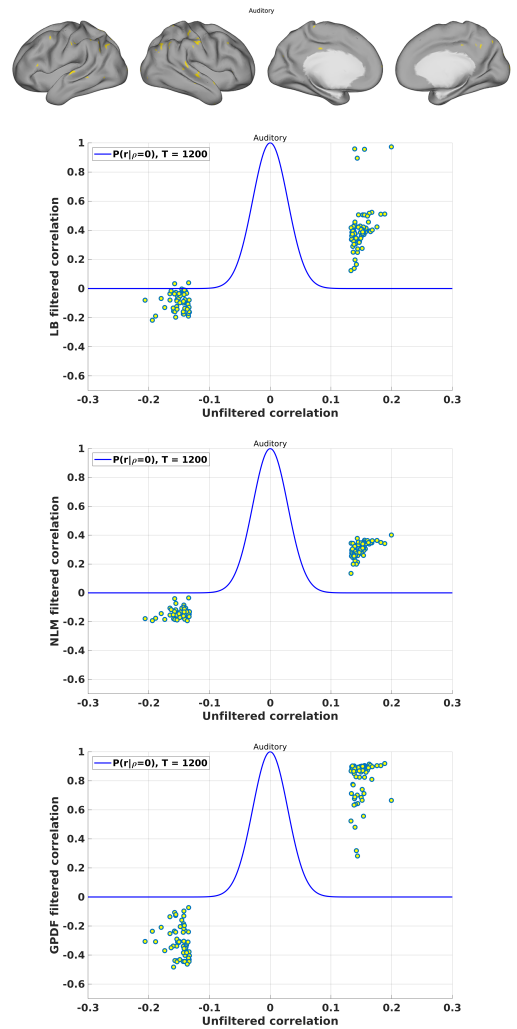


Figure S7: Scatter plots of the high correlation values.

Executive Control Network

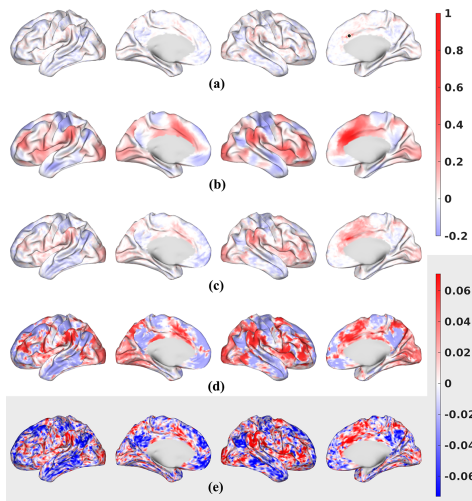


Figure S8: Seeded correlation maps. The seed was placed on the right anterior cingulate cortex.

Saliency Network

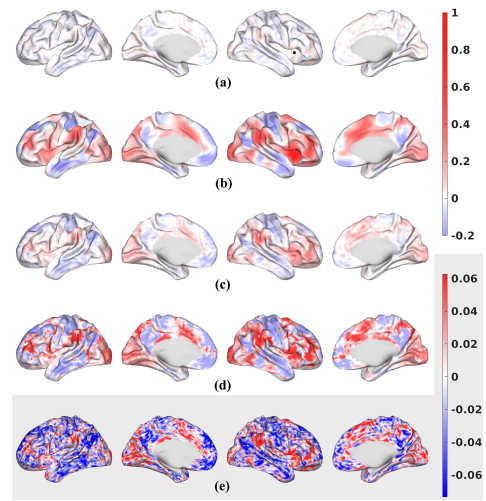


Figure S10: Seeded correlation maps. The seed was placed on the right anterior insula.

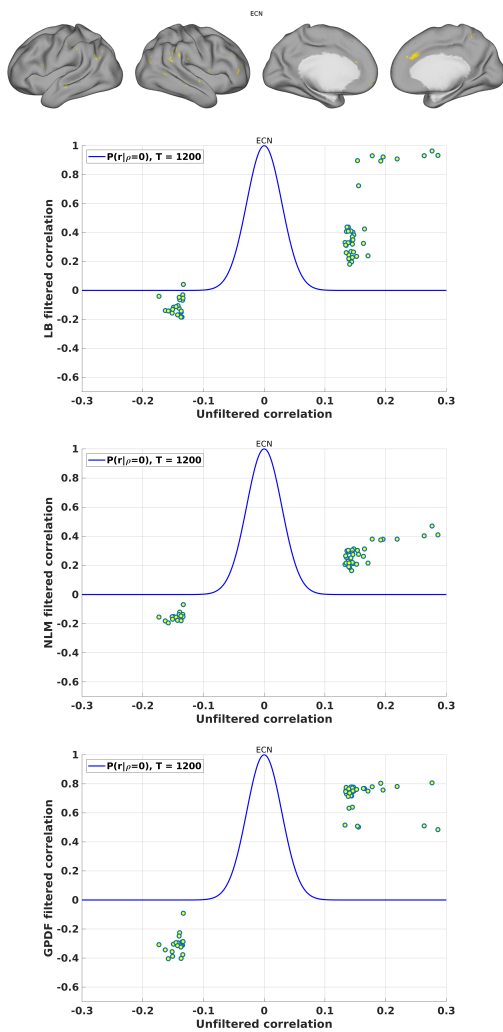


Figure S9: Scatter plots of the high correlation values.

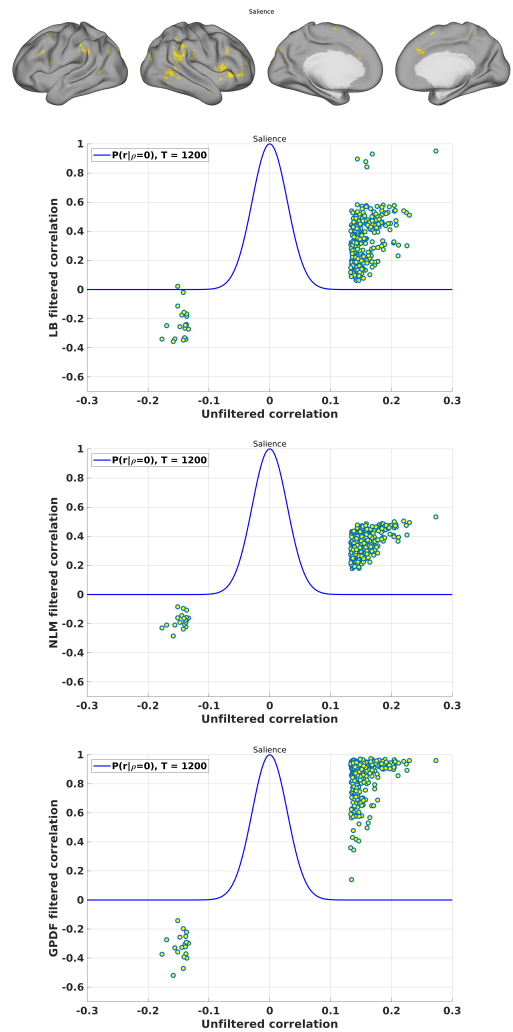


Figure S11: Scatter plots of the high correlation values.

Fronto-Parietal Attentional Control Network

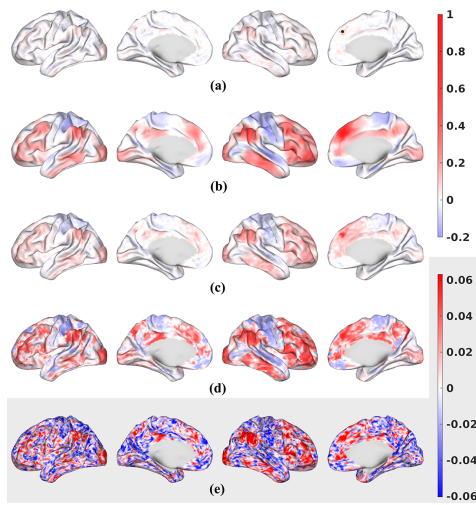


Figure S12: Seeded correlation maps. The seed was placed on the right dorso-medial prefrontal cortex.

Language Network

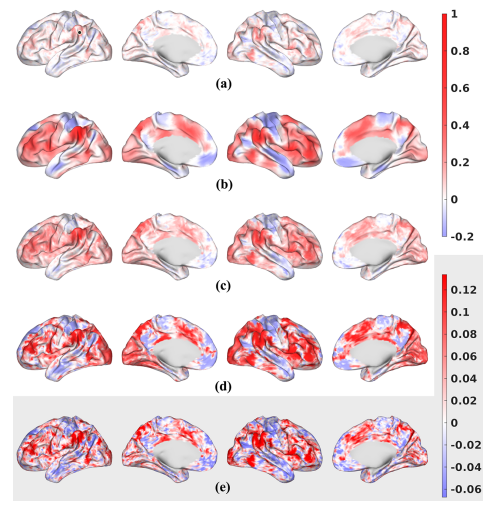


Figure S14: Seeded correlation maps. The seed was placed on the Wernicke's area.

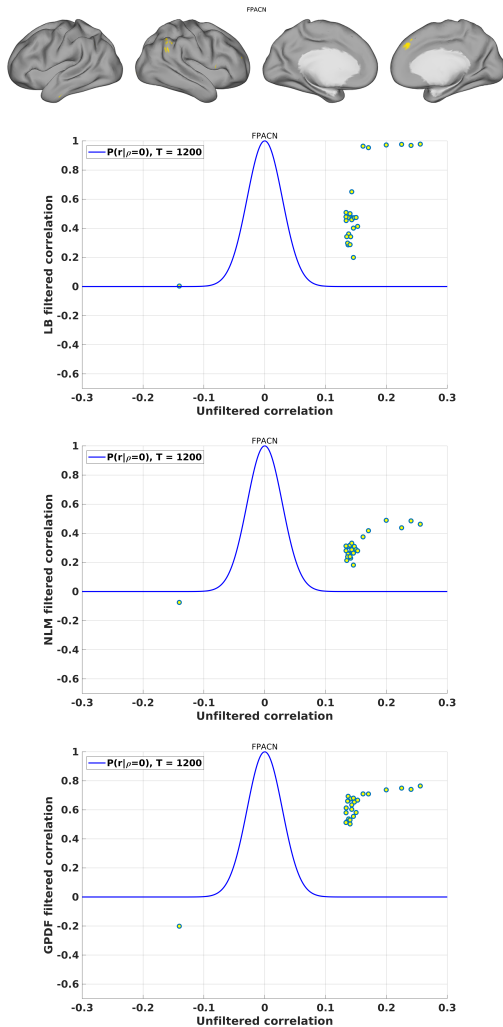


Figure S13: Scatter plots of the high correlation values.

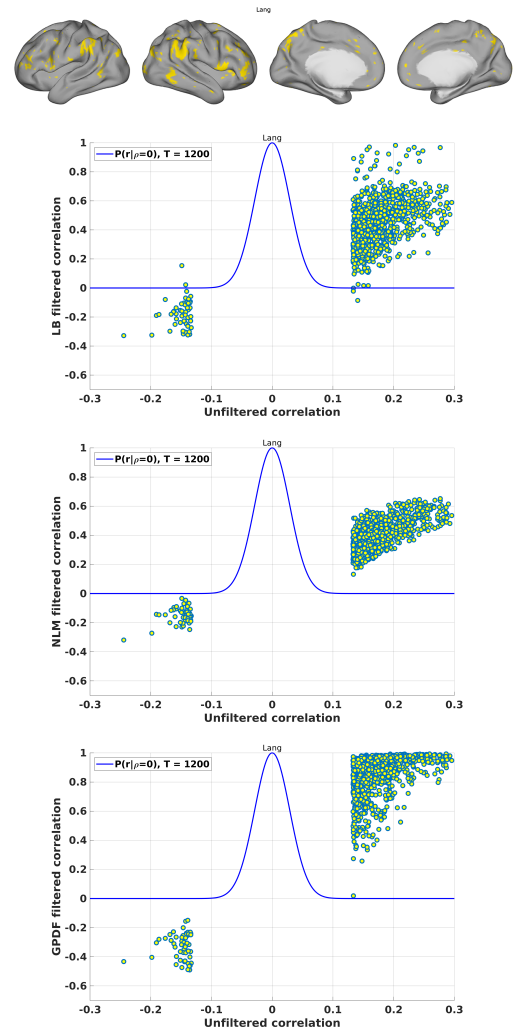


Figure S15: Scatter plots of the high correlation values.

Skewness Statistics

Table S1: Statistics (Wilcoxon signed rank) of skewness difference between GPDF and the unfiltered, the LB-filtered as well as the tNLM-filtered case.

| Task | Contrast | z-score (GPDF > Unfiltered) | p-value (GPDF > Unfiltered) | z-score (GPDF > LB) | p-value (GPDF > LB) | z-score (GPDF > tNLM) | p-value (GPDF > tNLM) |
|------------|---------------|-----------------------------------|-----------------------------------|---------------------------|---------------------------|-----------------------------|-----------------------------|
| Motor | t_avg | 6.83 | 4.27×10^{-12} | 10.97 | 2.64×10^{-28} | 5.51 | 1.77×10^{-8} |
| | lh_avg | 6.49 | 4.29×10^{-11} | 10.97 | 2.80×10^{-28} | 5.77 | 3.94×10^{-9} |
| | rh_avg | 6.48 | 4.70×10^{-11} | 10.97 | 2.64×10^{-28} | 6.06 | 6.78×10^{-10} |
| | lf_avg | 7.16 | 3.95×10^{-13} | 10.96 | 2.96×10^{-28} | 7.16 | 4.15×10^{-13} |
| | rf_avg | 6.27 | 1.82×10^{-10} | 10.97 | 2.75×10^{-28} | 7.36 | 9.51×10^{-14} |
| Language | math_story | 7.67 | 8.90×10^{-15} | 10.97 | 2.64×10^{-28} | 6.76 | 7.10×10^{-12} |
| Emotion | faces_shapes | 8.04 | 4.48×10^{-16} | 10.96 | 3.07×10^{-28} | 9.75 | 8.85×10^{-23} |
| Gambling | punish_reward | 6.87 | 3.21×10^{-12} | 10.97 | 2.64×10^{-28} | 8.33 | 3.93×10^{-17} |
| Relational | match_rel | 7.87 | 1.81×10^{-15} | 10.63 | 1.13×10^{-26} | 9.99 | 1.03×10^{-23} |
| Social | random_tom | 7.89 | 1.57×10^{-15} | 10.97 | 2.64×10^{-28} | 8.49 | 1.03×10^{-17} |
| WM | 0bk_2bk | 7.37 | 8.37×10^{-14} | 10.97 | 2.64×10^{-28} | 5.99 | 1.05×10^{-9} |
| | face_avg | 7.99 | 6.60×10^{-16} | 10.95 | 3.25×10^{-28} | 7.89 | 1.49×10^{-15} |
| | place_avg | 8.21 | 1.13×10^{-16} | 10.97 | 2.69×10^{-28} | 7.57 | 1.94×10^{-14} |
| | tool_avg | 7.68 | 8.11×10^{-15} | 10.97 | 2.69×10^{-28} | 7.33 | 1.12×10^{-13} |
| | body_avg | 8.01 | 5.44×10^{-16} | 10.97 | 2.69×10^{-28} | 7.32 | 1.27×10^{-13} |