

Supplementary

The following figures provide additional quantitative assessments of the BridgeBP conversion process, complementing the results presented in the main paper. To obtain a more comprehensive evaluation of reconstruction performance, we include (i) error-based metrics using mean squared error (MSE) as an alternative to correlation, (ii) scatter comparisons of true versus reconstructed non-zero structural connectivity (SC) across multiple atlases, and (iii) group-level analyses examining the effects of kernel smoothing on reconstruction performance. Figure S1 shows the standard deviations of conversion accuracy in Figure 3 (main text) for randomly selected 100 ABCD subjects.

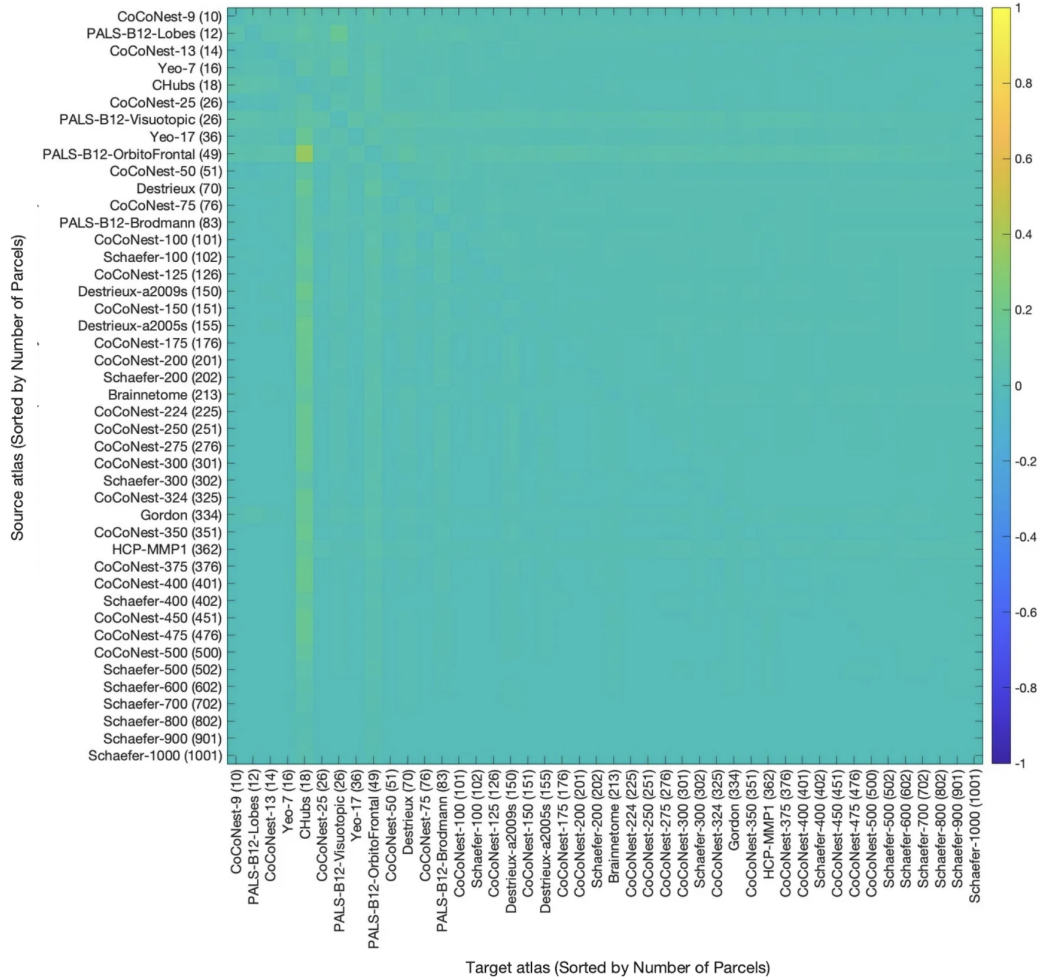


Figure S1. Standard deviations of conversion accuracy in Figure 3 (main text), reflecting small variability in SC conversion between atlas pairs.

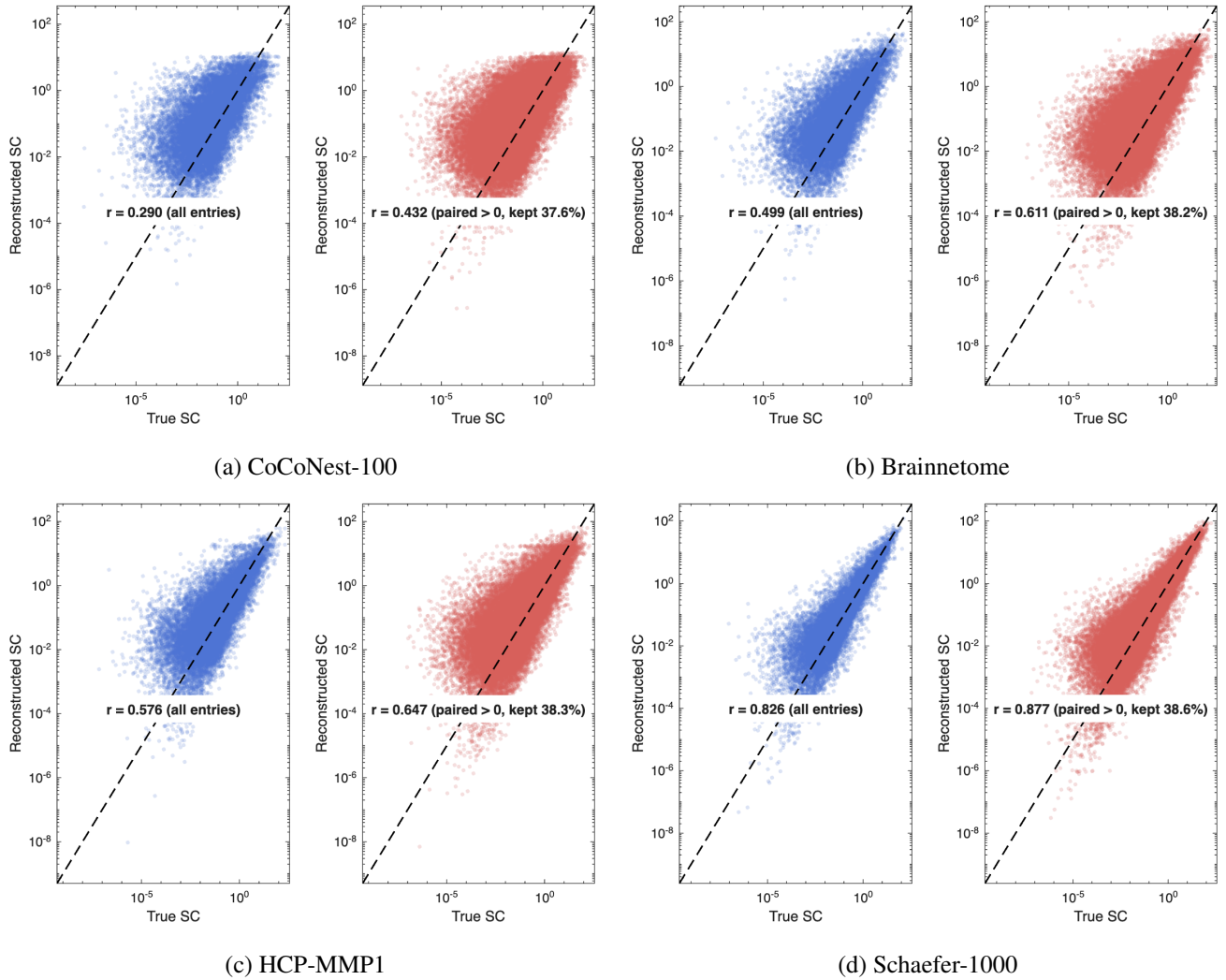


Figure S3. Scatter comparison of true versus reconstructed SC after zero-value removal. Results are shown for four atlas: (a) CoCoNest-100 (101 parcels); (b) Brainnetome (213 parcels); (c) HCP-MMP1 (362 parcels); (d) Schaefer-1000 (1001 parcels). Each panel illustrates the reconstructed SC values and the corresponding scatter plots between true and reconstructed matrices, with Pearson correlations (r) reported for all non-zero entries.

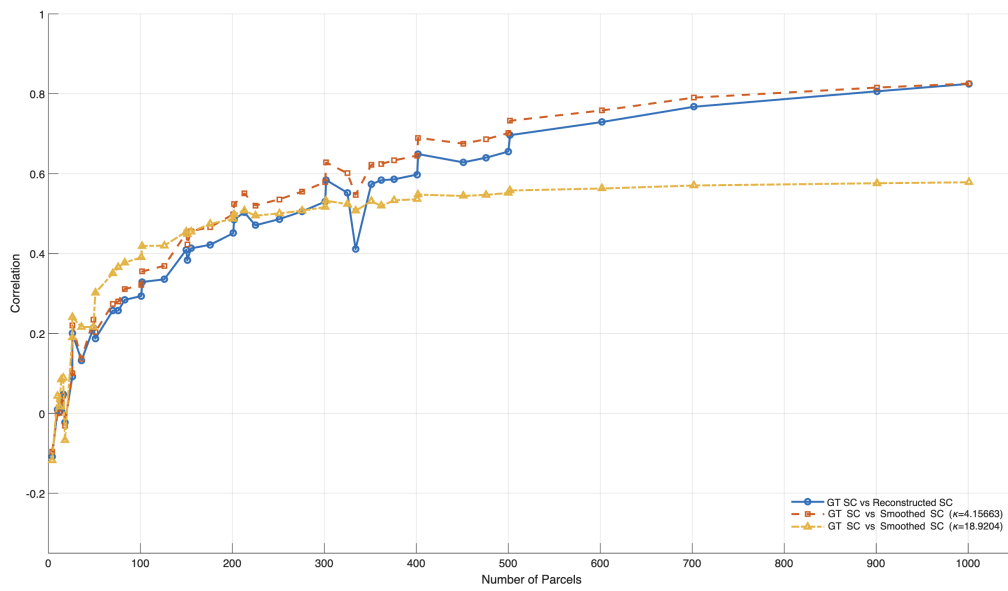


Figure S4. Group mean correlation between ground truth (GT) and reconstructed SC across 100 subjects. Correlations are shown as a function of the number of parcels, comparing GT SC with reconstructed SC (blue) and with smoothed SCs obtained using two different kernel bandwidths ($\kappa = 4.1563$ and $\kappa = 18.9204$).