Content

[S1. Detailed information for recruitment. 3](#_Toc27313)

[S2. Detailed information on MRI data acquisition and preprocessing procedure. 4](#_Toc28705)

[S3. Detailed information of the working memory paradigm. 5](#_Toc2167)

[S4. Controllability metrics 6](#_Toc17909)

[S5. Gene annotation analysis of regions showing altered controllability in SZs but not in SBs, compared with HCs. 9](#_Toc14507)

[Table S1. Controllability difference across all groups at the ‘0-back’ load. 11](#_Toc25321)

[Table S2. Controllability between male and female under ‘0-back’ load. 12](#_Toc4416)

[Table S3. Controllability between male and female under ‘2-back’ load. 17](#_Toc8822)

[Table S4. Comparison of controllability between low and high antipsychotic doses patients under ‘0-back’ load. 22](#_Toc28631)

[Table S5. Comparison of controllability between low and high antipsychotic doses patients under ‘2-back’ load. 27](#_Toc17307)

[Table S6. Correlation analysis between the detected modal controllability, neurocognitive performances, and clinical characteristics in schizophrenia under ‘0-back’ load. 32](#_Toc6088)

[Table S7. Correlation analysis between the detected modal controllability, neurocognitive performances, and clinical characteristics in schizophrenia under ‘2-back’ load. 33](#_Toc25408)

[Table S8. Correlation analysis between the detected average controllability, neurocognitive performances, and clinical characteristics in schizophrenia under ‘0-back’ load. 35](#_Toc17803)

[Table S9. Correlation analysis between the detected average controllability, neurocognitive performances, and clinical characteristics in schizophrenia under ‘2-back’ load. 36](#_Toc14981)

[Table S10. Correlation analysis between the detected modal controllability and neurocognitive performances in unaffected siblings and healthy controls under ‘0-back’ load. 37](#_Toc2613)

[Table S11. Correlation analysis between the detected modal controllability and neurocognitive performances in unaffected siblings and healthy controls under ‘2-back’ load. 38](#_Toc18615)

[Table S12. Correlation analysis between the detected average controllability and neurocognitive performances in unaffected siblings and healthy controls under ‘0-back’ load. 41](#_Toc6191)

[Table S13. Correlation analysis between the detected average controllability and neurocognitive performances in unaffected siblings and healthy controls under ‘2-back’ load. 42](#_Toc3520)

[Table S14. Details of gene annotation analysis. 43](#_Toc12879)

[Table S15. Details of gene enrichment analysis. 44](#_Toc24911)

[Figure S1. The paradigm of n-back task. 46](#_Toc14579)

[Figure S2. Conceptual schematic of average controllability and modal controllability. 47](#_Toc5135)

[Figure S3. The distribution of areas that showed omnibus differences of average controllability across all groups under ‘0-back’ load. 48](#_Toc27863)

[Figure S4. The distribution of areas that showed omnibus differences of modal controllability across all groups under ‘0-back’ load. 49](#_Toc13207)

[Figure S5. Results of correlation analysis in average controllability among SZs under ‘2-back’ load. 50](#_Toc32189)

[Figure S6. Results of correlation analysis in modal controllability among SZs under ‘2-back’ load. 51](#_Toc20233)

[Figure S7. Results of genetic enrichment analysis based of results in controllability during ‘2-back’ load. 52](#_Toc27418)

[References 53](#_Toc18807)

### S1. Detailed information for recruitment.

All participants were right-handed native Chinese speakers, and signed written informed consent to participate in this study. All patients and SBs were recruited from the Second Xiangya Hospital, Central South University, while HCs from local community.

Patients were recruited from the Second Xiangya Hospital, Central South University. The diagnosis was conducted by two psychiatrists using all available information, including a review of case files and the Structural Clinical Interview for DSM-IV. Exclusion criteria included age < 16 or > 45, neurological disorders, history of substance dependence, history of receiving electroconvulsive therapy, or any contraindications to MRI. Clinical symptoms were assessed using the Scale for the Assessment of Positive Symptoms (SAPS) and the Scale for the Assessment of Negative Symptoms (SANS) on the day of the scan. Cognitive function was evaluated using the information and digit-symbol subscales of the Wechsler Adult Intelligence Scale-Chinese Revised (WAIS-CR).

HCs were recruited from the local community through advertisement. HCs underwent assessment using the Structured Clinical Interview for DSM-IV Axis I Disorders, Research Version, Non-patient Edition (SCID-I/NP). None of the HCs met criteria for any mental disorders, and their first-degree relatives had no history of diagnosed psychiatric disorders.

SBs were also recruited via the Second Xiangya Hospital, Central South University at the same time as patients. Due to the historical birth policy in China and the large age difference between some siblings and patients, only a small proportion of patients had suitable siblings for recruitment. The assessment and exclusion criteria for SBs were the same as those for HCs, except for a family history of schizophrenia.

### S2. Detailed information on MRI data acquisition and preprocessing procedure.

MRI data was acquired on a Siemens Allegra 3-T scanner using a gradient-recalled echo-planar imaging pulse sequence with the following parameters: matrix = 64 × 64, slices = 32, slice thickness = 5 mm, gap =0 mm, flip angle = 90°, FOV = 240 × 240 mm2, repetition time (TR) =2000 ms, echo time (TE) = 30 ms, and total volumes=253.

Data preprocessing was conducted on the DPABI toolbox(18). The initial 5 volumes were excluded to ensure magnetic saturation stability for MRI data. Subsequently, the remaining 248 volumes underwent the following preprocessing steps: slice timing correction, motion realignment, spatial smoothing, and normalization to the Montreal Neurological Institute (MNI) space. Nuisance covariates, including 12 head motion parameters, white matter signals, and ventricular signals, were regressed out. The global signal was retained due to potential disease-related variations. To address low-frequency drift and high-frequency physiological noise, a band-pass filter (0.08-0.15 Hz) was applied to the fMRI data. Interpolation of displaced volumes (framewise displacement > 0.5 mm) was performed using the nearest neighbor method. Exclusion criteria included: (1) Head motions exceeding 2.5° rotation or 2.5-mm translation in any direction, and (2) Failures in the normalization and registration of fMRI data to MNI space resulting from acquisition errors.

### S3. Detailed information of the working memory paradigm.

The adopted WM paradigm comprised two types of load conditions (‘0-back’ and ‘2-back’). Subjects pressed a button once when they saw the letter ‘x’ in the ‘0-back’ condition; in the ‘2-back’ condition, subjects pressed a button once when the letter presented was the same as two letters prior. There was a stimulus interval of 1500 ms between each 500 ms letter display, and each block was composed of 20 stimuli containing 7 targets following an instruction shown for 2 s. Participants were ordered to fixate on a cross in the center of a screen for 20s during resting periods. Resting periods, four ‘0-back’ blocks, and four ‘2-back’ blocks alternated within the whole experiment. A detailed description of this paradigm is given in **Figure S1**.

Subjects pressed a button once when they saw the letter “x” in the “0-back” condition; in the “2-back” condition, subjects pressed a button once when the letter presented was the same as two letters prior.

### S4. Controllability metrics

Average controllability measures a node's ability to drive the brain through all easily accessible states, taking into account the average input energy required. It corresponds to the trace of the Gramian matrix and is inversely related to the energy needed to control shifts in brain states. Brain regions with higher average controllability can facilitate transitions between functional states with less input energy, suggesting they can more readily achieve desirable network states.

Modal controllability assesses how easily a single control node can steer the brain into states that are typically harder to reach. Regions with higher modal controllability can more effectively influence the dynamics of a brain network toward these difficult states, though this often requires substantial energy for executing complex, goal-specific operations.

The calculation of controllability refers to previous research in control theory conducted under resting-state conditions (1). Detailed information was seen in **Supplementary Figure S2**. The neurodynamic model of controllability is derived from control theory commonly employed in engineering. It can be estimated using a simplified noise-free linear discrete-time and time-invariant model:(2, 3)

where (*N*=264) represents the brain state at a given moment, reflecting the magnitude of BOLD activity, *t* [range: ] denotes the time interval for state changes in discrete control systems. We extend τ from 0 to infinity based on prior research(3), which suggests that all state transitions can theoretically occur within this time frame. The use of infinity simplifies calculations. is the weighted and symmetric adjacency matrix. The matrix *A* is calculated using the following formula,

where is the largest eigenvalue of the FC matrix, and *I* denotes the identity matrix. The estimated matrix *A* is used in the equation . This setup follows conventions seen in various control theory works(2, 4).

The control input matrix represents a set of control points *K* in the brain where

in which is the canonical vector of dimension *N*. In our case, 264 ROIs were designed as control points. We set one ROI as a control point at a time, thus matrix *B* is a one-dimensional vector, e.g. = (1 0 0 0…) when the first brain region is the control point. The represents the energy applied to the control point to drive state transition, which can be calculated by the following equation:(5)

We note that we don’t need to calculate the value of . is proportional to the inverse of the controllability Gramian ().(5) The purpose of quantifying the control properties of brain regions can be achieved by directly estimating *W*(3).

Brain network controllability refers to the ability to transition from the current state to a desired target state through external control energy input. A network is deemed controllable if it can be directed from an initial state to various target states within a finite timeframe. The controllability of a brain network with *K* control points is equal to the controllability Gramian matrix (), in which

means the multiplication of A matrix (AAA...A) for *τ* times. The average input energy required for control points to drive the system is proportional to the trace of the inverse of .

Average controllability measures a node's capacity to drive the brain to all easily reachable states while considering the average input energy cost. It is quantified by the trace of the controllability Gramian matrix . Therefore, average controllability is inversely related to the control energy needed for state transitions in the brain. Brain regions with higher average controllability can facilitate transitions between functional states using less input energy, suggesting their pivotal role in network state transitions.

Modal controllability measures how easily a single control node can drive the brain into difficult-to-reach states. Mathematically, the modal controllability of control node i, denotes as , is defined as:

where denotes the *j*th eigenvalue of adjacency matrix *A*. is the eigenvector matrix of *A*. Regions with higher modal controllability can more easily drive the dynamics of a brain network towards hard-to-reach states, characterized by high energy costs required for executing complex, goal-specific operations.

### S5. Gene annotation analysis of regions showing altered controllability in SZs but not in SBs, compared with HCs.

We derived the regions with altered controllability compared to HC in SZ but not SB as a mask to perform the genetic annotation and enrichment analysis. The **Supplementary Figure S7** shows the detailed results of the genetic enrichment analysis. As given in **Table 2** in the main manuscript, more than half of the detected ROIs with group differences in average controllability and modal controllability were included in this analysis. These ROIs involve a large scale of brain regions, such as frontal gyri, temporal gyri, sensory-motor gyri, and subcortical area. Therefore, the results of gene annotation and genetic enrichment analysis for these brain regions may lack specificity.

For the GO enrichment analysis, in terms of BP (biological process), regulation of presynaptic membrane potential (GO:0099505), neurotransmitter receptor localization to postsynaptic specialization membrane (GO:0099645), and synaptic vesicle priming (GO:0016082) represented statistically most significant enrichment after correcting the P-value through FDR; in terms of CC (cellular component), postsynaptic cytosol (GO:0099524) and juxtaparanode region of axon (GO:0044224) represented statistically most significant enrichment; in terms of MF (molecular function), voltage-gated monoatomic ion channel activity involved in regulation of presynaptic membrane potential (GO:0099508) represented statistically most significant enrichment. In terms of the KEEG (Kyoto Encyclopedia of Genes and Genomes) pathway, long-term potentiation (hsa04720) and synaptic vesicle cycle (hsa04721) represented statistically most significant enrichment. The significantly enriched gene expression abnormalities identified in the aforementioned gene enrichment analysis are predominantly associated with synaptic functions. This suggests a close relationship between brain functional abnormalities in schizophrenia and synaptic dysfunctions caused by gene expression. These synaptic dysfunctions involve various aspects including ion gating and regulation of presynaptic membrane potentials, vesicle initiation and cycling, postsynaptic neurotransmitter receptors, cytoplasm, and long-term potentiation. Previous studies have indicated that abnormal expression of certain genes can impair synaptic plasticity through multiple pathways, thereby affecting neural function stability and playing a crucial role in the pathogenesis of schizophrenia(6, 7), which aligns with our findings.

### Table S1. Controllability difference across all groups at the ‘0-back’ load.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Network** | **Brain Region** | **MNI space** | | | **FDR- corrected *p*** | ***Post hoc* Tukey significance** | | | **Mean (Controllability)** | | |
| **x** | **y** | **z** | **HCs vs SBs** | **HCs vs SZs** | **SBs vs SZs** | **HCs** | **SBs** | **SZs** |
| **Average Controllability** | | | | | | | | | | | | |
| 147 | VN | L\_Middle Occipital Gyrus | -28 | -79 | 19 | <0.001\* | 0.184 | 0.004\* | <0.001\* | 0.0109 | 0.0438 | -0.0165 |
| 161 | VN | R\_Inferior Temporal Gyrus | 42 | -66 | -8 | <0.001\* | 0.064 | 0.014\* | <0.001\* | 0.0131 | 0.0375 | -0.0165 |
| 236 | VAN | L\_Middle Temporal Gyrus | -56 | -50 | 10 | <0.001\* | 0.160 | 0.001\* | <0.001\* | 0.0172 | 0.0453 | -0.0207 |
| **Modal Controllability** | | | | | | | | | | | | |
| 83 | DMN | L\_Middle Temporal Gyrus | -68 | -23 | -16 | <0.001\* | 0.928 | <0.001\* | 0.003\* | 0.0008 | 0.0010 | -0.0007 |
| 102 | DMN | R\_Medial Frontal Gyrus | 13 | 55 | 38 | <0.001\* | 0.429 | 0.001\* | <0.001\* | 0.0007 | 0.0016 | -0.0008 |
| 181 | FPN | R\_Middle Orbital Frontal Gyrus | 34 | 54 | -13 | <0.001\* | 0.035\* | 0.012\* | <0.001\* | 0.0004 | 0.0017 | -0.0006 |
| 84 | Uncertain | L\_Middle Temporal Gyrus | -58 | -26 | -15 | <0.001\* | 0.978 | <0.001\* | 0.006\* | 0.0008 | 0.0009 | -0.0007 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); VN, Visual Network; VAN, Ventral Attention Network; DMN, Default Mode Network; FPN, Fronto-parietal Task Control Network; ROI, regions of interest; HCs, healthy controls; SBs, siblings; SZs, schizophrenia patients; FDR, False Discovery Rate; L, left; R, right. The controllability values mentioned above are all the residual values of the de-covariant variables.

### Table S2. Controllability between male and female under ‘0-back’ load.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Average controllability** | | | **Modal controllability** | | |
| **SZs**  **FDR-*p*** | **SBs**  **FDR-*p*** | **HCs**  **FDR-*p*** | **SZs**  **FDR-*p*** | **SBs**  **FDR-*p*** | **HCs**  **FDR-*p*** |
| 1 | 0.991 | 0.987 | 0.996 | 0.994 | 0.961 | 0.995 |
| 2 | 0.991 | 0.996 | 0.996 | 0.994 | 0.862 | 0.995 |
| 3 | 0.991 | 0.927 | 0.928 | 0.994 | 0.862 | 0.997 |
| 4 | 0.991 | 0.880 | 0.198 | 0.994 | 0.862 | 0.264 |
| 5 | 0.991 | 0.996 | 0.804 | 0.994 | 0.862 | 0.743 |
| 6 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.998 |
| 7 | 0.991 | 0.996 | 0.828 | 0.994 | 0.988 | 0.978 |
| 8 | 0.991 | 0.894 | 0.989 | 0.994 | 0.961 | 0.823 |
| 9 | 0.991 | 0.880 | 0.951 | 0.996 | 0.862 | 0.649 |
| 10 | 0.991 | 0.880 | 0.996 | 0.988 | 0.988 | 0.608 |
| 11 | 0.991 | 0.880 | 0.804 | 0.994 | 0.988 | 0.668 |
| 12 | 0.991 | 0.898 | 0.828 | 0.994 | 0.995 | 0.995 |
| 13 | 0.991 | 0.985 | 0.804 | 0.994 | 0.862 | 0.863 |
| 14 | 0.991 | 0.880 | 0.804 | 0.988 | 0.988 | 0.870 |
| 15 | 0.991 | 0.880 | 0.900 | 0.988 | 0.985 | 0.997 |
| 16 | 0.991 | 0.985 | 0.996 | 0.994 | 0.979 | 0.995 |
| 17 | 0.997 | 0.985 | 0.951 | 0.994 | 0.988 | 0.743 |
| 18 | 0.991 | 0.880 | 0.876 | 0.994 | 0.862 | 0.995 |
| 19 | 0.991 | 0.880 | 0.714 | 0.988 | 0.862 | 0.995 |
| 20 | 0.991 | 0.880 | 0.996 | 0.682 | 0.961 | 0.823 |
| 21 | 0.991 | 0.945 | 0.714 | 0.994 | 0.862 | 0.975 |
| 22 | 0.991 | 0.880 | 0.804 | 0.994 | 0.862 | 0.995 |
| 23 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.995 |
| 24 | 0.991 | 0.985 | 0.996 | 0.988 | 0.899 | 0.721 |
| 25 | 0.997 | 0.945 | 0.804 | 0.988 | 0.913 | 0.995 |
| 26 | 0.991 | 0.985 | 0.618 | 0.988 | 0.988 | 0.627 |
| 27 | 0.991 | 0.996 | 0.996 | 0.988 | 0.988 | 0.995 |
| 28 | 0.991 | 0.927 | 0.996 | 0.994 | 0.988 | 0.995 |
| 29 | 0.991 | 0.964 | 0.804 | 0.988 | 0.862 | 0.995 |
| 30 | 0.991 | 0.916 | 0.996 | 0.994 | 0.913 | 0.995 |
| 31 | 0.991 | 0.880 | 0.828 | 0.994 | 0.515 | 0.840 |
| 32 | 0.991 | 0.987 | 0.989 | 0.988 | 0.862 | 0.978 |
| 33 | 0.991 | 0.916 | 0.996 | 0.988 | 0.899 | 0.626 |
| 34 | 0.991 | 0.945 | 0.996 | 0.988 | 0.988 | 0.995 |
| 35 | 0.991 | 0.880 | 0.996 | 0.996 | 0.873 | 0.995 |
| 36 | 0.991 | 0.880 | 0.062 | 0.988 | 0.862 | 0.708 |
| 37 | 0.991 | 0.880 | 0.903 | 0.994 | 0.988 | 0.995 |
| 38 | 0.991 | 0.985 | 0.903 | 0.994 | 0.862 | 0.995 |
| 39 | 0.991 | 0.882 | 0.804 | 0.988 | 0.988 | 0.995 |
| 40 | 0.991 | 0.985 | 0.690 | 0.988 | 0.988 | 0.823 |
| 41 | 0.991 | 0.880 | 0.804 | 0.988 | 0.913 | 0.999 |
| 42 | 0.991 | 0.987 | 0.996 | 0.994 | 0.862 | 0.747 |
| 43 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.995 |
| 44 | 0.991 | 0.880 | 0.996 | 0.988 | 0.862 | 0.978 |
| 45 | 0.991 | 0.927 | 0.996 | 0.988 | 0.988 | 0.995 |
| 46 | 0.991 | 0.880 | 0.618 | 0.994 | 0.862 | 0.608 |
| 47 | 0.991 | 0.985 | 0.804 | 0.994 | 0.871 | 0.608 |
| 48 | 0.991 | 0.987 | 0.996 | 0.988 | 0.862 | 0.542 |
| 49 | 0.991 | 0.987 | 0.996 | 0.994 | 0.988 | 0.997 |
| 50 | 0.991 | 0.927 | 0.903 | 0.994 | 0.862 | 0.995 |
| 51 | 0.991 | 0.996 | 0.804 | 0.994 | 0.988 | 0.756 |
| 52 | 0.991 | 0.880 | 0.989 | 0.994 | 0.862 | 0.863 |
| 53 | 0.991 | 0.880 | 0.903 | 0.994 | 0.870 | 0.995 |
| 54 | 0.991 | 0.933 | 0.804 | 0.996 | 0.862 | 0.608 |
| 55 | 0.991 | 0.891 | 0.804 | 0.996 | 0.988 | 0.681 |
| 56 | 0.991 | 0.880 | 0.996 | 0.988 | 0.988 | 0.900 |
| 57 | 0.991 | 0.882 | 0.996 | 0.994 | 0.862 | 0.995 |
| 58 | 0.991 | 0.880 | 0.804 | 0.988 | 0.908 | 0.995 |
| 59 | 0.991 | 0.993 | 0.996 | 0.994 | 0.952 | 0.608 |
| 60 | 0.991 | 0.880 | 0.804 | 0.994 | 0.988 | 0.995 |
| 61 | 0.997 | 0.996 | 0.996 | 0.988 | 0.988 | 0.995 |
| 62 | 0.991 | 0.996 | 0.996 | 0.994 | 0.862 | 0.995 |
| 63 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.654 |
| 64 | 0.991 | 0.880 | 0.996 | 0.988 | 0.913 | 0.608 |
| 65 | 0.997 | 0.880 | 0.804 | 0.988 | 0.862 | 0.654 |
| 66 | 0.991 | 0.880 | 0.876 | 0.996 | 0.862 | 0.995 |
| 67 | 0.991 | 0.927 | 0.690 | 0.994 | 0.862 | 0.542 |
| 68 | 0.991 | 0.985 | 0.996 | 0.988 | 0.988 | 0.608 |
| 69 | 0.991 | 0.880 | 0.804 | 0.994 | 0.899 | 0.616 |
| 70 | 0.991 | 0.880 | 0.914 | 0.994 | 0.862 | 0.649 |
| 71 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.948 |
| 72 | 0.991 | 0.880 | 0.903 | 0.988 | 0.988 | 0.608 |
| 73 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.823 |
| 74 | 0.991 | 0.880 | 0.804 | 0.988 | 0.985 | 0.608 |
| 75 | 0.991 | 0.880 | 0.996 | 0.988 | 0.862 | 0.654 |
| 76 | 0.991 | 0.897 | 0.828 | 0.988 | 0.862 | 0.995 |
| 77 | 0.997 | 0.927 | 0.804 | 0.988 | 0.988 | 0.997 |
| 78 | 0.991 | 0.880 | 0.996 | 0.994 | 0.515 | 0.542 |
| 79 | 0.991 | 0.891 | 0.951 | 0.988 | 0.925 | 0.721 |
| 80 | 0.991 | 0.880 | 0.996 | 0.994 | 0.913 | 0.616 |
| 81 | 0.991 | 0.880 | 0.537 | 0.988 | 0.862 | 0.823 |
| 82 | 0.991 | 0.880 | 0.964 | 0.994 | 0.961 | 0.995 |
| 83 | 0.991 | 0.985 | 0.804 | 0.988 | 0.862 | 0.608 |
| 84 | 0.991 | 0.880 | 0.996 | 0.994 | 0.988 | 0.604 |
| 85 | 0.991 | 0.880 | 0.932 | 0.994 | 0.913 | 0.995 |
| 86 | 0.991 | 0.916 | 0.996 | 0.988 | 0.862 | 0.668 |
| 87 | 0.991 | 0.880 | 0.804 | 0.994 | 0.899 | 0.975 |
| 88 | 0.991 | 0.880 | 0.804 | 0.988 | 0.988 | 0.995 |
| 89 | 0.991 | 0.891 | 0.804 | 0.988 | 0.988 | 0.743 |
| 90 | 0.991 | 0.880 | 0.996 | 0.994 | 0.961 | 0.874 |
| 91 | 0.991 | 0.921 | 0.996 | 0.994 | 0.988 | 0.995 |
| 92 | 0.991 | 0.880 | 0.996 | 0.994 | 0.988 | 0.930 |
| 93 | 0.991 | 0.996 | 0.804 | 0.994 | 0.863 | 0.998 |
| 94 | 0.991 | 0.880 | 0.618 | 0.994 | 0.988 | 0.995 |
| 95 | 0.991 | 0.880 | 0.989 | 0.994 | 0.899 | 0.995 |
| 96 | 0.991 | 0.916 | 0.989 | 0.994 | 0.862 | 0.978 |
| 97 | 0.991 | 0.880 | 0.804 | 0.988 | 0.862 | 0.624 |
| 98 | 0.991 | 0.880 | 0.804 | 0.994 | 0.862 | 0.995 |
| 99 | 0.991 | 0.985 | 0.912 | 0.994 | 0.925 | 0.995 |
| 100 | 0.991 | 0.880 | 0.804 | 0.994 | 0.961 | 0.743 |
| 101 | 0.991 | 0.985 | 0.903 | 0.994 | 0.961 | 0.840 |
| 102 | 0.991 | 0.996 | 0.996 | 0.994 | 0.862 | 0.995 |
| 103 | 0.991 | 0.880 | 0.637 | 0.994 | 0.913 | 0.997 |
| 104 | 0.991 | 0.880 | 0.804 | 0.994 | 0.862 | 0.870 |
| 105 | 0.991 | 0.880 | 0.996 | 0.988 | 0.870 | 0.995 |
| 106 | 0.991 | 0.880 | 0.804 | 0.994 | 0.913 | 0.995 |
| 107 | 0.991 | 0.880 | 0.804 | 0.988 | 0.874 | 0.995 |
| 108 | 0.997 | 0.880 | 0.996 | 0.994 | 0.988 | 0.995 |
| 109 | 0.991 | 0.880 | 0.804 | 0.994 | 0.899 | 0.995 |
| 110 | 0.991 | 0.987 | 0.996 | 0.994 | 0.913 | 0.997 |
| 111 | 0.997 | 0.985 | 0.903 | 0.988 | 0.862 | 0.995 |
| 112 | 0.991 | 0.985 | 0.932 | 0.988 | 0.913 | 0.823 |
| 113 | 0.991 | 0.985 | 0.903 | 0.994 | 0.862 | 0.933 |
| 114 | 0.991 | 0.927 | 0.804 | 0.994 | 0.862 | 0.995 |
| 115 | 0.991 | 0.996 | 0.992 | 0.994 | 0.870 | 0.995 |
| 116 | 0.991 | 0.931 | 0.804 | 0.988 | 0.988 | 0.523 |
| 117 | 0.991 | 0.880 | 0.671 | 0.994 | 0.862 | 0.995 |
| 118 | 0.991 | 0.985 | 0.934 | 0.994 | 0.995 | 0.823 |
| 119 | 0.991 | 0.987 | 0.996 | 0.994 | 0.862 | 0.995 |
| 120 | 0.991 | 0.880 | 0.996 | 0.994 | 0.916 | 0.995 |
| 121 | 0.991 | 0.927 | 0.996 | 0.988 | 0.913 | 0.995 |
| 122 | 0.997 | 0.926 | 0.996 | 0.988 | 0.988 | 0.995 |
| 123 | 0.991 | 0.880 | 0.942 | 0.988 | 0.862 | 0.608 |
| 124 | 0.991 | 0.987 | 0.925 | 0.988 | 0.995 | 0.681 |
| 125 | 0.991 | 0.985 | 0.996 | 0.994 | 0.988 | 0.823 |
| 126 | 0.991 | 0.880 | 0.996 | 0.994 | 0.913 | 0.747 |
| 127 | 0.991 | 0.985 | 0.828 | 0.994 | 0.862 | 0.995 |
| 128 | 0.991 | 0.987 | 0.804 | 0.994 | 0.961 | 0.997 |
| 129 | 0.991 | 0.880 | 0.903 | 0.994 | 0.957 | 0.995 |
| 130 | 0.991 | 0.880 | 0.996 | 0.994 | 0.988 | 0.995 |
| 131 | 0.991 | 0.880 | 0.996 | 0.994 | 0.982 | 0.995 |
| 132 | 0.991 | 0.880 | 0.804 | 0.988 | 0.862 | 0.997 |
| 133 | 0.991 | 0.927 | 0.804 | 0.994 | 0.988 | 0.948 |
| 134 | 0.995 | 0.880 | 0.996 | 0.996 | 0.862 | 0.654 |
| 135 | 0.997 | 0.880 | 0.996 | 0.994 | 0.862 | 0.978 |
| 136 | 0.991 | 0.927 | 0.804 | 0.994 | 0.899 | 0.995 |
| 137 | 0.991 | 0.985 | 0.537 | 0.994 | 0.913 | 0.995 |
| 138 | 0.991 | 0.880 | 0.828 | 0.994 | 0.995 | 0.649 |
| 139 | 0.991 | 0.882 | 0.996 | 0.994 | 0.916 | 0.995 |
| 140 | 0.991 | 0.880 | 0.804 | 0.994 | 0.862 | 0.483 |
| 141 | 0.991 | 0.996 | 0.618 | 0.988 | 0.862 | 0.483 |
| 142 | 0.991 | 0.880 | 0.996 | 0.988 | 0.995 | 0.863 |
| 143 | 0.991 | 0.987 | 0.714 | 0.994 | 0.862 | 0.608 |
| 144 | 0.991 | 0.985 | 0.828 | 0.994 | 0.988 | 0.995 |
| 145 | 0.997 | 0.880 | 0.996 | 0.994 | 0.862 | 0.542 |
| 146 | 0.991 | 0.880 | 0.804 | 0.994 | 0.862 | 0.608 |
| 147 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.901 |
| 148 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.608 |
| 149 | 0.991 | 0.985 | 0.989 | 0.988 | 0.862 | 0.995 |
| 150 | 0.991 | 0.880 | 0.804 | 0.994 | 0.988 | 0.624 |
| 151 | 0.991 | 0.880 | 0.804 | 0.988 | 0.862 | 0.604 |
| 152 | 0.991 | 0.880 | 0.932 | 0.994 | 0.862 | 0.608 |
| 153 | 0.991 | 0.880 | 0.996 | 0.988 | 0.862 | 0.743 |
| 154 | 0.991 | 0.985 | 0.903 | 0.994 | 0.862 | 0.995 |
| 155 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.840 |
| 156 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.616 |
| 157 | 0.991 | 0.916 | 0.989 | 0.988 | 0.862 | 0.972 |
| 158 | 0.991 | 0.985 | 0.996 | 0.988 | 0.862 | 0.649 |
| 159 | 0.991 | 0.880 | 0.804 | 0.994 | 0.913 | 0.995 |
| 160 | 0.991 | 0.880 | 0.989 | 0.994 | 0.862 | 0.608 |
| 161 | 0.991 | 0.985 | 0.989 | 0.994 | 0.988 | 0.995 |
| 162 | 0.991 | 0.927 | 0.996 | 0.988 | 0.862 | 0.870 |
| 163 | 0.991 | 0.996 | 0.828 | 0.994 | 0.979 | 0.624 |
| 164 | 0.991 | 0.985 | 0.996 | 0.994 | 0.988 | 0.995 |
| 165 | 0.991 | 0.993 | 0.804 | 0.994 | 0.862 | 0.616 |
| 166 | 0.991 | 0.880 | 0.996 | 0.996 | 0.862 | 0.624 |
| 167 | 0.991 | 0.880 | 0.996 | 0.988 | 0.916 | 0.608 |
| 168 | 0.997 | 0.985 | 0.804 | 0.994 | 0.913 | 0.995 |
| 169 | 0.991 | 0.927 | 0.996 | 0.988 | 0.862 | 0.995 |
| 170 | 0.991 | 0.891 | 0.989 | 0.994 | 0.862 | 0.608 |
| 171 | 0.991 | 0.996 | 0.951 | 0.994 | 0.862 | 0.995 |
| 172 | 0.991 | 0.927 | 0.996 | 0.994 | 0.862 | 0.746 |
| 173 | 0.991 | 0.996 | 0.996 | 0.988 | 0.862 | 0.995 |
| 174 | 0.991 | 0.985 | 0.804 | 0.988 | 0.870 | 0.608 |
| 175 | 0.991 | 0.894 | 0.989 | 0.988 | 0.913 | 0.995 |
| 176 | 0.991 | 0.996 | 0.804 | 0.994 | 0.862 | 0.608 |
| 177 | 0.991 | 0.996 | 0.690 | 0.994 | 0.913 | 0.649 |
| 178 | 0.997 | 0.985 | 0.996 | 0.994 | 0.988 | 0.608 |
| 179 | 0.991 | 0.985 | 0.996 | 0.994 | 0.988 | 0.626 |
| 180 | 0.997 | 0.880 | 0.951 | 0.994 | 0.961 | 0.995 |
| 181 | 0.991 | 0.880 | 0.903 | 0.994 | 0.862 | 0.930 |
| 182 | 0.991 | 0.945 | 0.925 | 0.994 | 0.862 | 0.995 |
| 183 | 1.000 | 0.880 | 0.618 | 0.994 | 0.988 | 0.608 |
| 184 | 0.991 | 0.985 | 0.804 | 0.994 | 0.862 | 0.997 |
| 185 | 0.991 | 0.985 | 0.714 | 0.994 | 0.862 | 0.649 |
| 186 | 0.991 | 0.880 | 0.996 | 0.996 | 0.916 | 0.928 |
| 187 | 0.991 | 0.985 | 0.804 | 0.988 | 0.961 | 0.782 |
| 188 | 0.991 | 0.880 | 0.804 | 0.994 | 0.862 | 0.840 |
| 189 | 0.991 | 0.880 | 0.996 | 0.988 | 0.913 | 0.995 |
| 190 | 0.991 | 0.996 | 0.804 | 0.996 | 0.913 | 0.721 |
| 191 | 0.991 | 0.996 | 0.903 | 0.996 | 0.988 | 0.746 |
| 192 | 0.991 | 0.880 | 0.903 | 0.994 | 0.873 | 0.975 |
| 193 | 0.991 | 0.880 | 0.867 | 0.994 | 0.988 | 0.997 |
| 194 | 0.991 | 0.985 | 0.804 | 0.994 | 0.916 | 0.668 |
| 195 | 0.991 | 0.880 | 0.804 | 0.994 | 0.913 | 0.721 |
| 196 | 0.991 | 0.880 | 0.996 | 0.994 | 0.515 | 0.995 |
| 197 | 0.991 | 0.985 | 0.996 | 0.994 | 0.862 | 0.708 |
| 198 | 0.991 | 0.987 | 0.828 | 0.996 | 0.995 | 0.743 |
| 199 | 0.991 | 0.880 | 0.804 | 0.994 | 0.913 | 0.823 |
| 200 | 0.997 | 0.916 | 0.989 | 0.994 | 0.919 | 0.995 |
| 201 | 0.997 | 0.985 | 0.311 | 0.994 | 0.988 | 0.743 |
| 202 | 0.997 | 0.927 | 0.714 | 0.994 | 0.862 | 0.719 |
| 203 | 0.991 | 0.985 | 0.996 | 0.994 | 0.988 | 0.995 |
| 204 | 0.991 | 0.880 | 0.692 | 0.994 | 0.916 | 0.823 |
| 205 | 0.991 | 0.985 | 0.804 | 0.994 | 0.988 | 0.995 |
| 206 | 0.991 | 0.987 | 0.804 | 0.994 | 0.913 | 0.622 |
| 207 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.995 |
| 208 | 0.991 | 0.880 | 0.996 | 0.988 | 0.862 | 0.995 |
| 209 | 0.991 | 0.880 | 0.804 | 0.988 | 0.916 | 0.995 |
| 210 | 0.991 | 0.927 | 0.996 | 0.994 | 0.916 | 0.995 |
| 211 | 0.997 | 0.880 | 0.804 | 0.994 | 0.988 | 0.901 |
| 212 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.681 |
| 213 | 0.991 | 0.880 | 0.804 | 0.994 | 0.862 | 0.608 |
| 214 | 0.997 | 0.880 | 0.804 | 0.994 | 0.975 | 0.746 |
| 215 | 0.991 | 0.996 | 0.996 | 0.988 | 0.918 | 0.608 |
| 216 | 0.991 | 0.985 | 0.996 | 0.994 | 0.995 | 0.608 |
| 217 | 0.997 | 0.880 | 0.989 | 0.994 | 0.862 | 0.626 |
| 218 | 1.000 | 0.927 | 0.996 | 0.994 | 0.913 | 0.972 |
| 219 | 0.991 | 0.996 | 0.996 | 0.994 | 0.862 | 0.785 |
| 220 | 0.991 | 0.987 | 0.804 | 0.994 | 0.862 | 0.873 |
| 221 | 0.991 | 0.880 | 0.828 | 0.994 | 0.862 | 0.840 |
| 222 | 0.991 | 0.916 | 0.989 | 0.994 | 0.862 | 0.995 |
| 223 | 0.991 | 0.880 | 0.996 | 0.988 | 0.862 | 0.995 |
| 224 | 0.991 | 0.880 | 0.989 | 0.994 | 0.862 | 0.995 |
| 225 | 0.997 | 0.880 | 0.828 | 0.988 | 0.988 | 0.998 |
| 226 | 0.991 | 0.985 | 0.804 | 0.994 | 0.862 | 0.995 |
| 227 | 1.000 | 0.985 | 0.903 | 0.994 | 0.862 | 0.995 |
| 228 | 0.991 | 0.880 | 0.996 | 0.994 | 0.916 | 0.721 |
| 229 | 0.991 | 0.916 | 0.996 | 0.994 | 0.862 | 0.995 |
| 230 | 0.991 | 0.996 | 0.885 | 0.994 | 0.862 | 0.721 |
| 231 | 0.991 | 0.987 | 0.996 | 0.988 | 0.988 | 0.795 |
| 232 | 0.997 | 0.880 | 0.850 | 0.988 | 0.899 | 0.840 |
| 233 | 0.991 | 0.945 | 0.804 | 0.994 | 0.919 | 0.608 |
| 234 | 0.997 | 0.880 | 0.932 | 0.988 | 0.988 | 0.542 |
| 235 | 0.997 | 0.985 | 0.996 | 0.994 | 0.916 | 0.933 |
| 236 | 0.991 | 0.417 | 0.996 | 0.996 | 0.862 | 0.928 |
| 237 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.823 |
| 238 | 0.991 | 0.880 | 0.996 | 0.996 | 0.862 | 0.608 |
| 239 | 0.991 | 0.880 | 0.900 | 0.994 | 0.862 | 0.721 |
| 240 | 0.991 | 0.880 | 0.996 | 0.994 | 0.985 | 0.823 |
| 241 | 0.991 | 0.927 | 0.804 | 0.994 | 0.862 | 0.743 |
| 242 | 0.991 | 0.996 | 0.804 | 0.988 | 0.961 | 0.995 |
| 243 | 0.991 | 0.985 | 0.618 | 0.994 | 0.919 | 0.542 |
| 244 | 0.991 | 0.985 | 0.804 | 0.994 | 0.862 | 0.542 |
| 245 | 0.991 | 0.926 | 0.804 | 0.988 | 0.913 | 0.608 |
| 246 | 0.991 | 0.880 | 0.068 | 0.994 | 0.988 | 0.608 |
| 247 | 0.991 | 0.985 | 0.804 | 0.988 | 0.961 | 0.995 |
| 248 | 0.991 | 0.880 | 0.996 | 0.988 | 0.988 | 0.702 |
| 249 | 0.991 | 0.880 | 0.804 | 0.994 | 0.899 | 0.995 |
| 250 | 0.991 | 0.995 | 0.828 | 0.994 | 0.862 | 0.995 |
| 251 | 0.991 | 0.880 | 0.996 | 0.994 | 0.862 | 0.978 |
| 252 | 0.991 | 0.927 | 0.804 | 0.994 | 0.979 | 0.978 |
| 253 | 0.991 | 0.880 | 0.804 | 0.994 | 0.862 | 0.542 |
| 254 | 0.997 | 0.880 | 0.992 | 0.994 | 0.988 | 0.972 |
| 255 | 0.991 | 0.985 | 0.996 | 0.988 | 0.862 | 0.995 |
| 256 | 0.991 | 0.891 | 0.992 | 0.996 | 0.862 | 0.782 |
| 257 | 0.991 | 0.880 | 0.903 | 0.994 | 0.862 | 0.823 |
| 258 | 0.997 | 0.880 | 0.996 | 0.994 | 0.873 | 0.930 |
| 259 | 0.991 | 0.996 | 0.996 | 0.996 | 0.862 | 0.746 |
| 260 | 0.991 | 0.880 | 0.804 | 0.994 | 0.870 | 0.608 |
| 261 | 0.991 | 0.880 | 0.989 | 0.994 | 0.862 | 0.681 |
| 262 | 0.991 | 0.927 | 0.804 | 0.988 | 0.952 | 0.668 |
| 263 | 0.991 | 0.927 | 0.996 | 0.994 | 0.988 | 0.978 |
| 264 | 0.991 | 0.945 | 0.996 | 0.994 | 0.862 | 0.823 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); SZs, schizophrenia patients; SBs, siblings; HCs, healthy controls, FDR, False Discovery Rate.

### Table S3. Controllability between male and female under ‘2-back’ load.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Average controllability** | | | **Modal controllability** | | |
| **SZs**  **FDR-*p*** | **SBs**  **FDR-*p*** | **HCs**  **FDR-*p*** | **SZs**  **FDR-*p*** | **SBs**  **FDR-*p*** | **HCs**  **FDR-*p*** |
| 1 | 0.908 | 0.785 | 0.950 | 0.993 | 0.961 | 0.996 |
| 2 | 0.867 | 0.825 | 0.950 | 0.993 | 0.864 | 0.996 |
| 3 | 0.974 | 0.528 | 0.824 | 0.993 | 0.864 | 0.997 |
| 4 | 0.987 | 0.825 | 0.396 | 0.993 | 0.864 | 0.264 |
| 5 | 0.867 | 0.779 | 0.950 | 0.993 | 0.864 | 0.744 |
| 6 | 0.881 | 0.883 | 0.889 | 0.993 | 0.864 | 0.998 |
| 7 | 0.785 | 0.800 | 0.885 | 0.993 | 0.988 | 0.978 |
| 8 | 0.903 | 0.825 | 0.986 | 0.993 | 0.961 | 0.823 |
| 9 | 0.867 | 0.785 | 0.997 | 0.996 | 0.864 | 0.650 |
| 10 | 0.710 | 0.619 | 0.768 | 0.993 | 0.988 | 0.614 |
| 11 | 0.881 | 0.785 | 0.948 | 0.993 | 0.988 | 0.677 |
| 12 | 0.915 | 0.655 | 0.915 | 0.993 | 0.995 | 0.996 |
| 13 | 0.986 | 0.843 | 0.763 | 0.993 | 0.864 | 0.864 |
| 14 | 0.867 | 0.708 | 0.827 | 0.993 | 0.988 | 0.871 |
| 15 | 0.867 | 0.548 | 0.768 | 0.993 | 0.986 | 0.997 |
| 16 | 0.964 | 0.528 | 0.780 | 0.993 | 0.979 | 0.996 |
| 17 | 0.987 | 0.710 | 0.820 | 0.993 | 0.988 | 0.744 |
| 18 | 0.702 | 0.883 | 0.862 | 0.993 | 0.870 | 0.996 |
| 19 | 0.867 | 0.817 | 0.768 | 0.993 | 0.864 | 0.996 |
| 20 | 0.594 | 0.785 | 0.686 | 0.792 | 0.961 | 0.823 |
| 21 | 0.867 | 0.825 | 0.832 | 0.993 | 0.864 | 0.976 |
| 22 | 0.867 | 0.785 | 0.871 | 0.993 | 0.864 | 0.996 |
| 23 | 0.976 | 0.785 | 0.873 | 0.993 | 0.870 | 0.996 |
| 24 | 0.878 | 0.528 | 0.768 | 0.993 | 0.892 | 0.721 |
| 25 | 0.867 | 0.520 | 0.973 | 0.993 | 0.899 | 0.996 |
| 26 | 0.594 | 0.528 | 0.616 | 0.993 | 0.988 | 0.625 |
| 27 | 0.867 | 0.528 | 0.768 | 0.993 | 0.988 | 0.996 |
| 28 | 0.975 | 0.712 | 0.915 | 0.993 | 0.988 | 0.996 |
| 29 | 0.908 | 0.785 | 0.832 | 0.993 | 0.864 | 0.996 |
| 30 | 0.930 | 0.883 | 0.948 | 0.993 | 0.899 | 0.996 |
| 31 | 0.942 | 0.570 | 0.780 | 0.993 | 0.528 | 0.841 |
| 32 | 0.710 | 0.785 | 0.768 | 0.993 | 0.864 | 0.978 |
| 33 | 0.655 | 0.959 | 0.915 | 0.993 | 0.892 | 0.625 |
| 34 | 0.867 | 0.674 | 0.986 | 0.993 | 0.988 | 0.996 |
| 35 | 0.867 | 0.883 | 0.885 | 0.996 | 0.881 | 0.996 |
| 36 | 0.698 | 0.920 | 0.686 | 0.993 | 0.864 | 0.717 |
| 37 | 0.867 | 0.619 | 0.768 | 0.993 | 0.988 | 0.996 |
| 38 | 0.985 | 0.655 | 0.786 | 0.993 | 0.864 | 0.996 |
| 39 | 0.763 | 0.539 | 0.934 | 0.993 | 0.988 | 0.996 |
| 40 | 0.842 | 0.528 | 0.934 | 0.993 | 0.988 | 0.823 |
| 41 | 0.655 | 0.739 | 0.915 | 0.993 | 0.913 | 0.999 |
| 42 | 0.867 | 0.088 | 0.915 | 0.993 | 0.864 | 0.747 |
| 43 | 0.991 | 0.481 | 0.768 | 0.993 | 0.864 | 0.996 |
| 44 | 0.781 | 0.358 | 0.885 | 0.993 | 0.864 | 0.978 |
| 45 | 0.867 | 0.699 | 0.915 | 0.993 | 0.988 | 0.996 |
| 46 | 0.789 | 0.528 | 0.686 | 0.993 | 0.864 | 0.609 |
| 47 | 0.867 | 0.929 | 0.768 | 0.993 | 0.879 | 0.609 |
| 48 | 0.685 | 0.971 | 0.528 | 0.993 | 0.864 | 0.550 |
| 49 | 0.930 | 0.528 | 0.915 | 0.993 | 0.988 | 0.997 |
| 50 | 0.844 | 0.955 | 0.997 | 0.993 | 0.864 | 0.996 |
| 51 | 0.930 | 0.747 | 0.768 | 0.993 | 0.988 | 0.755 |
| 52 | 0.867 | 0.528 | 0.768 | 0.993 | 0.864 | 0.864 |
| 53 | 0.867 | 0.883 | 0.986 | 0.993 | 0.877 | 0.996 |
| 54 | 0.956 | 0.866 | 0.768 | 0.996 | 0.864 | 0.609 |
| 55 | 0.781 | 0.528 | 0.616 | 0.996 | 0.988 | 0.684 |
| 56 | 0.594 | 0.528 | 0.768 | 0.993 | 0.988 | 0.900 |
| 57 | 0.785 | 0.528 | 0.786 | 0.993 | 0.864 | 0.996 |
| 58 | 0.669 | 0.528 | 0.780 | 0.993 | 0.899 | 0.996 |
| 59 | 0.972 | 0.817 | 0.871 | 0.993 | 0.946 | 0.609 |
| 60 | 0.785 | 0.548 | 0.901 | 0.993 | 0.988 | 0.996 |
| 61 | 0.908 | 0.779 | 0.963 | 0.993 | 0.988 | 0.996 |
| 62 | 0.867 | 0.472 | 0.876 | 0.993 | 0.870 | 0.996 |
| 63 | 0.930 | 0.411 | 0.616 | 0.993 | 0.864 | 0.654 |
| 64 | 0.710 | 0.619 | 0.686 | 0.993 | 0.913 | 0.609 |
| 65 | 0.930 | 0.411 | 0.616 | 0.993 | 0.864 | 0.654 |
| 66 | 0.930 | 0.288 | 0.827 | 0.996 | 0.864 | 0.996 |
| 67 | 0.930 | 0.345 | 0.440 | 0.993 | 0.864 | 0.550 |
| 68 | 0.867 | 0.655 | 0.616 | 0.993 | 0.988 | 0.609 |
| 69 | 0.930 | 0.481 | 0.603 | 0.993 | 0.892 | 0.616 |
| 70 | 0.867 | 0.211 | 0.673 | 0.993 | 0.864 | 0.650 |
| 71 | 0.867 | 0.088 | 0.768 | 0.993 | 0.864 | 0.948 |
| 72 | 0.655 | 0.699 | 0.528 | 0.993 | 0.988 | 0.609 |
| 73 | 0.867 | 0.573 | 0.768 | 0.993 | 0.864 | 0.823 |
| 74 | 0.655 | 0.528 | 0.832 | 0.993 | 0.986 | 0.609 |
| 75 | 0.698 | 0.528 | 0.950 | 0.993 | 0.864 | 0.654 |
| 76 | 0.867 | 0.841 | 0.827 | 0.993 | 0.864 | 0.996 |
| 77 | 0.700 | 0.827 | 0.832 | 0.993 | 0.988 | 0.997 |
| 78 | 0.930 | 0.481 | 0.768 | 0.993 | 0.264 | 0.550 |
| 79 | 0.650 | 0.619 | 0.873 | 0.993 | 0.920 | 0.721 |
| 80 | 0.867 | 0.520 | 0.889 | 0.993 | 0.913 | 0.616 |
| 81 | 0.867 | 0.481 | 0.768 | 0.993 | 0.864 | 0.823 |
| 82 | 0.698 | 0.936 | 0.928 | 0.993 | 0.961 | 0.996 |
| 83 | 0.685 | 0.528 | 0.827 | 0.993 | 0.864 | 0.609 |
| 84 | 0.930 | 0.800 | 0.786 | 0.993 | 0.988 | 0.603 |
| 85 | 0.698 | 0.548 | 0.934 | 0.993 | 0.913 | 0.996 |
| 86 | 0.594 | 0.699 | 0.974 | 0.993 | 0.864 | 0.677 |
| 87 | 0.702 | 0.672 | 0.934 | 0.993 | 0.892 | 0.976 |
| 88 | 0.846 | 0.528 | 0.768 | 0.993 | 0.988 | 0.996 |
| 89 | 0.867 | 0.528 | 0.768 | 0.993 | 0.988 | 0.744 |
| 90 | 0.867 | 0.561 | 0.691 | 0.993 | 0.961 | 0.873 |
| 91 | 0.702 | 0.573 | 0.925 | 0.993 | 0.988 | 0.996 |
| 92 | 0.930 | 0.528 | 0.950 | 0.993 | 0.988 | 0.931 |
| 93 | 0.881 | 0.785 | 0.832 | 0.993 | 0.870 | 0.998 |
| 94 | 0.867 | 0.528 | 0.673 | 0.993 | 0.988 | 0.996 |
| 95 | 0.930 | 0.779 | 0.832 | 0.993 | 0.892 | 0.996 |
| 96 | 0.802 | 0.994 | 0.889 | 0.993 | 0.864 | 0.978 |
| 97 | 0.867 | 0.619 | 0.948 | 0.993 | 0.864 | 0.623 |
| 98 | 0.972 | 0.947 | 0.786 | 0.993 | 0.864 | 0.996 |
| 99 | 0.930 | 0.746 | 0.948 | 0.993 | 0.920 | 0.996 |
| 100 | 0.986 | 0.619 | 0.828 | 0.993 | 0.961 | 0.744 |
| 101 | 0.930 | 0.607 | 0.994 | 0.993 | 0.961 | 0.841 |
| 102 | 0.974 | 0.779 | 0.915 | 0.993 | 0.864 | 0.996 |
| 103 | 0.930 | 0.736 | 0.915 | 0.993 | 0.913 | 0.997 |
| 104 | 0.930 | 0.800 | 0.996 | 0.993 | 0.864 | 0.871 |
| 105 | 0.702 | 0.591 | 0.915 | 0.993 | 0.877 | 0.996 |
| 106 | 0.930 | 0.752 | 0.885 | 0.993 | 0.899 | 0.996 |
| 107 | 0.655 | 0.528 | 0.780 | 0.993 | 0.882 | 0.996 |
| 108 | 0.987 | 0.528 | 0.915 | 0.993 | 0.988 | 0.996 |
| 109 | 0.710 | 0.756 | 0.768 | 0.993 | 0.892 | 0.996 |
| 110 | 0.972 | 0.771 | 0.948 | 0.993 | 0.899 | 0.997 |
| 111 | 0.867 | 0.740 | 0.827 | 0.993 | 0.870 | 0.996 |
| 112 | 0.702 | 0.740 | 0.994 | 0.993 | 0.892 | 0.823 |
| 113 | 0.789 | 0.785 | 0.934 | 0.993 | 0.864 | 0.932 |
| 114 | 0.930 | 0.710 | 0.852 | 0.993 | 0.864 | 0.996 |
| 115 | 0.896 | 0.800 | 0.871 | 0.993 | 0.877 | 0.996 |
| 116 | 0.655 | 0.655 | 0.768 | 0.993 | 0.988 | 0.550 |
| 117 | 0.986 | 0.481 | 0.768 | 0.993 | 0.864 | 0.996 |
| 118 | 0.930 | 0.535 | 0.992 | 0.993 | 0.995 | 0.823 |
| 119 | 0.867 | 0.411 | 0.832 | 0.993 | 0.864 | 0.996 |
| 120 | 0.964 | 0.591 | 0.991 | 0.993 | 0.916 | 0.996 |
| 121 | 0.702 | 0.211 | 0.934 | 0.993 | 0.913 | 0.996 |
| 122 | 0.867 | 0.528 | 0.974 | 0.993 | 0.988 | 0.996 |
| 123 | 0.655 | 0.211 | 0.616 | 0.993 | 0.864 | 0.609 |
| 124 | 0.867 | 0.843 | 0.915 | 0.993 | 0.995 | 0.684 |
| 125 | 0.986 | 0.655 | 0.945 | 0.993 | 0.988 | 0.823 |
| 126 | 0.937 | 0.528 | 0.928 | 0.993 | 0.899 | 0.747 |
| 127 | 0.867 | 0.966 | 0.994 | 0.993 | 0.864 | 0.996 |
| 128 | 0.962 | 0.528 | 0.768 | 0.993 | 0.961 | 0.997 |
| 129 | 0.964 | 0.785 | 0.832 | 0.993 | 0.951 | 0.996 |
| 130 | 0.867 | 0.699 | 0.950 | 0.993 | 0.988 | 0.996 |
| 131 | 0.878 | 0.785 | 0.974 | 0.993 | 0.982 | 0.996 |
| 132 | 0.594 | 0.308 | 0.832 | 0.993 | 0.864 | 0.997 |
| 133 | 0.710 | 0.528 | 0.934 | 0.993 | 0.988 | 0.949 |
| 134 | 0.930 | 0.866 | 0.786 | 0.996 | 0.864 | 0.654 |
| 135 | 0.986 | 0.883 | 0.915 | 0.993 | 0.864 | 0.978 |
| 136 | 0.930 | 0.411 | 0.768 | 0.993 | 0.892 | 0.996 |
| 137 | 0.867 | 0.721 | 0.963 | 0.993 | 0.899 | 0.996 |
| 138 | 0.867 | 0.655 | 0.915 | 0.993 | 0.995 | 0.650 |
| 139 | 0.930 | 0.528 | 0.950 | 0.993 | 0.916 | 0.996 |
| 140 | 0.942 | 0.800 | 0.572 | 0.993 | 0.864 | 0.440 |
| 141 | 0.867 | 0.883 | 0.396 | 0.993 | 0.864 | 0.440 |
| 142 | 0.781 | 0.785 | 0.983 | 0.993 | 0.995 | 0.864 |
| 143 | 0.867 | 0.883 | 0.768 | 0.993 | 0.870 | 0.609 |
| 144 | 0.867 | 0.785 | 0.827 | 0.993 | 0.988 | 0.996 |
| 145 | 0.867 | 0.656 | 0.768 | 0.993 | 0.864 | 0.550 |
| 146 | 0.983 | 0.519 | 0.768 | 0.993 | 0.864 | 0.609 |
| 147 | 0.698 | 0.591 | 0.963 | 0.993 | 0.864 | 0.901 |
| 148 | 0.867 | 0.620 | 0.928 | 0.993 | 0.864 | 0.614 |
| 149 | 0.594 | 0.825 | 0.827 | 0.993 | 0.870 | 0.996 |
| 150 | 0.867 | 0.800 | 0.885 | 0.993 | 0.988 | 0.623 |
| 151 | 0.698 | 0.655 | 0.768 | 0.993 | 0.864 | 0.603 |
| 152 | 0.930 | 0.740 | 0.768 | 0.993 | 0.864 | 0.609 |
| 153 | 0.594 | 0.528 | 0.871 | 0.993 | 0.864 | 0.744 |
| 154 | 0.986 | 0.481 | 0.871 | 0.993 | 0.864 | 0.996 |
| 155 | 0.900 | 0.800 | 0.974 | 0.993 | 0.864 | 0.841 |
| 156 | 0.867 | 0.843 | 0.852 | 0.993 | 0.864 | 0.616 |
| 157 | 0.702 | 0.785 | 0.894 | 0.993 | 0.864 | 0.972 |
| 158 | 0.594 | 0.883 | 0.889 | 0.993 | 0.864 | 0.650 |
| 159 | 0.785 | 0.827 | 0.948 | 0.993 | 0.913 | 0.996 |
| 160 | 0.975 | 0.712 | 0.915 | 0.993 | 0.864 | 0.609 |
| 161 | 0.655 | 0.746 | 0.961 | 0.993 | 0.988 | 0.996 |
| 162 | 0.781 | 0.619 | 0.915 | 0.993 | 0.864 | 0.871 |
| 163 | 0.867 | 0.698 | 0.871 | 0.993 | 0.979 | 0.623 |
| 164 | 0.975 | 0.785 | 0.915 | 0.993 | 0.988 | 0.996 |
| 165 | 0.698 | 0.528 | 0.768 | 0.993 | 0.864 | 0.616 |
| 166 | 0.867 | 0.834 | 0.915 | 0.996 | 0.864 | 0.623 |
| 167 | 0.655 | 0.971 | 0.768 | 0.993 | 0.916 | 0.609 |
| 168 | 0.867 | 0.591 | 0.933 | 0.993 | 0.899 | 0.996 |
| 169 | 0.655 | 0.883 | 0.915 | 0.993 | 0.864 | 0.996 |
| 170 | 0.867 | 0.740 | 0.768 | 0.993 | 0.864 | 0.609 |
| 171 | 0.762 | 0.528 | 0.768 | 0.993 | 0.864 | 0.996 |
| 172 | 0.594 | 0.817 | 0.994 | 0.993 | 0.870 | 0.746 |
| 173 | 0.655 | 0.779 | 0.915 | 0.993 | 0.864 | 0.996 |
| 174 | 0.702 | 0.883 | 0.832 | 0.993 | 0.877 | 0.616 |
| 175 | 0.698 | 0.825 | 0.964 | 0.993 | 0.913 | 0.996 |
| 176 | 0.867 | 0.800 | 0.768 | 0.993 | 0.864 | 0.614 |
| 177 | 0.867 | 0.785 | 0.768 | 0.993 | 0.899 | 0.650 |
| 178 | 0.930 | 0.800 | 0.686 | 0.993 | 0.988 | 0.609 |
| 179 | 0.710 | 0.722 | 0.832 | 0.993 | 0.988 | 0.625 |
| 180 | 0.698 | 0.528 | 0.786 | 0.993 | 0.920 | 0.996 |
| 181 | 0.930 | 0.817 | 0.964 | 0.993 | 0.864 | 0.930 |
| 182 | 0.594 | 0.994 | 0.950 | 0.993 | 0.864 | 0.996 |
| 183 | 0.781 | 0.785 | 0.768 | 0.993 | 0.988 | 0.609 |
| 184 | 0.867 | 0.779 | 0.950 | 0.993 | 0.864 | 0.997 |
| 185 | 0.844 | 0.710 | 0.768 | 0.993 | 0.864 | 0.650 |
| 186 | 0.986 | 0.528 | 0.991 | 0.996 | 0.916 | 0.930 |
| 187 | 0.594 | 0.834 | 0.832 | 0.993 | 0.961 | 0.782 |
| 188 | 0.867 | 0.966 | 0.871 | 0.993 | 0.864 | 0.841 |
| 189 | 0.867 | 0.740 | 0.832 | 0.993 | 0.913 | 0.996 |
| 190 | 0.930 | 0.883 | 0.915 | 0.996 | 0.913 | 0.721 |
| 191 | 0.908 | 0.883 | 0.950 | 0.996 | 0.988 | 0.746 |
| 192 | 0.904 | 0.825 | 0.950 | 0.993 | 0.881 | 0.976 |
| 193 | 0.930 | 0.710 | 0.768 | 0.993 | 0.988 | 0.997 |
| 194 | 0.867 | 0.985 | 0.768 | 0.993 | 0.916 | 0.677 |
| 195 | 0.930 | 0.779 | 0.780 | 0.993 | 0.899 | 0.721 |
| 196 | 0.986 | 0.211 | 0.997 | 0.993 | 0.528 | 0.996 |
| 197 | 0.867 | 0.825 | 0.992 | 0.993 | 0.864 | 0.719 |
| 198 | 0.987 | 0.528 | 0.832 | 0.996 | 0.995 | 0.744 |
| 199 | 0.930 | 0.940 | 0.997 | 0.993 | 0.913 | 0.823 |
| 200 | 0.930 | 0.880 | 0.827 | 0.993 | 0.920 | 0.996 |
| 201 | 0.987 | 0.785 | 0.780 | 0.993 | 0.988 | 0.744 |
| 202 | 0.986 | 0.825 | 0.806 | 0.993 | 0.864 | 0.719 |
| 203 | 0.893 | 0.740 | 0.768 | 0.993 | 0.988 | 0.996 |
| 204 | 0.964 | 0.856 | 0.915 | 0.993 | 0.916 | 0.823 |
| 205 | 0.867 | 0.607 | 0.934 | 0.993 | 0.988 | 0.996 |
| 206 | 0.930 | 0.827 | 0.871 | 0.993 | 0.905 | 0.623 |
| 207 | 0.908 | 0.528 | 0.994 | 0.993 | 0.864 | 0.996 |
| 208 | 0.655 | 0.528 | 0.945 | 0.993 | 0.864 | 0.996 |
| 209 | 0.655 | 0.785 | 0.950 | 0.993 | 0.916 | 0.996 |
| 210 | 0.655 | 0.785 | 0.948 | 0.993 | 0.916 | 0.996 |
| 211 | 0.867 | 0.655 | 0.934 | 0.993 | 0.988 | 0.901 |
| 212 | 0.964 | 0.481 | 0.994 | 0.993 | 0.864 | 0.689 |
| 213 | 0.881 | 0.739 | 0.768 | 0.993 | 0.864 | 0.609 |
| 214 | 0.987 | 0.710 | 0.873 | 0.993 | 0.975 | 0.746 |
| 215 | 0.698 | 0.785 | 0.871 | 0.993 | 0.919 | 0.609 |
| 216 | 0.964 | 0.806 | 0.832 | 0.993 | 0.995 | 0.609 |
| 217 | 0.930 | 0.591 | 0.950 | 0.993 | 0.890 | 0.625 |
| 218 | 0.976 | 0.955 | 0.871 | 0.993 | 0.913 | 0.972 |
| 219 | 0.930 | 0.817 | 0.974 | 0.993 | 0.864 | 0.784 |
| 220 | 0.930 | 0.619 | 0.786 | 0.993 | 0.864 | 0.873 |
| 221 | 0.975 | 0.883 | 0.996 | 0.993 | 0.864 | 0.841 |
| 222 | 0.655 | 0.211 | 0.997 | 0.993 | 0.864 | 0.996 |
| 223 | 0.964 | 0.825 | 0.786 | 0.993 | 0.864 | 0.996 |
| 224 | 0.867 | 0.528 | 0.768 | 0.993 | 0.864 | 0.996 |
| 225 | 0.987 | 0.740 | 0.885 | 0.993 | 0.988 | 0.998 |
| 226 | 0.710 | 0.619 | 0.832 | 0.993 | 0.870 | 0.996 |
| 227 | 0.867 | 0.812 | 0.950 | 0.993 | 0.864 | 0.996 |
| 228 | 0.930 | 0.843 | 0.828 | 0.993 | 0.916 | 0.721 |
| 229 | 0.930 | 0.528 | 0.996 | 0.993 | 0.870 | 0.996 |
| 230 | 0.702 | 0.880 | 0.950 | 0.993 | 0.864 | 0.721 |
| 231 | 0.867 | 0.785 | 0.997 | 0.993 | 0.988 | 0.802 |
| 232 | 0.795 | 0.551 | 0.994 | 0.993 | 0.892 | 0.841 |
| 233 | 0.972 | 0.856 | 0.780 | 0.993 | 0.920 | 0.614 |
| 234 | 0.822 | 0.710 | 0.768 | 0.993 | 0.988 | 0.550 |
| 235 | 0.867 | 0.528 | 0.780 | 0.993 | 0.916 | 0.932 |
| 236 | 0.975 | 0.211 | 0.824 | 0.996 | 0.864 | 0.930 |
| 237 | 0.867 | 0.519 | 0.616 | 0.993 | 0.864 | 0.823 |
| 238 | 0.930 | 0.198 | 0.616 | 0.996 | 0.864 | 0.609 |
| 239 | 0.710 | 0.528 | 0.974 | 0.993 | 0.864 | 0.721 |
| 240 | 0.975 | 0.481 | 0.768 | 0.993 | 0.986 | 0.823 |
| 241 | 0.867 | 0.481 | 0.885 | 0.993 | 0.870 | 0.744 |
| 242 | 0.655 | 0.539 | 0.982 | 0.993 | 0.961 | 0.996 |
| 243 | 0.781 | 0.991 | 0.616 | 0.993 | 0.920 | 0.550 |
| 244 | 0.976 | 0.785 | 0.616 | 0.993 | 0.864 | 0.550 |
| 245 | 0.867 | 0.800 | 0.616 | 0.993 | 0.899 | 0.609 |
| 246 | 0.986 | 0.785 | 0.768 | 0.993 | 0.988 | 0.609 |
| 247 | 0.930 | 0.800 | 0.824 | 0.993 | 0.961 | 0.996 |
| 248 | 0.972 | 0.825 | 0.768 | 0.993 | 0.988 | 0.702 |
| 249 | 0.930 | 0.779 | 0.768 | 0.993 | 0.892 | 0.996 |
| 250 | 0.781 | 0.740 | 0.915 | 0.993 | 0.864 | 0.996 |
| 251 | 0.930 | 0.779 | 0.974 | 0.993 | 0.864 | 0.978 |
| 252 | 0.921 | 0.674 | 0.768 | 0.993 | 0.979 | 0.978 |
| 253 | 0.937 | 0.711 | 0.768 | 0.993 | 0.864 | 0.550 |
| 254 | 0.867 | 0.655 | 0.948 | 0.993 | 0.988 | 0.972 |
| 255 | 0.702 | 0.817 | 0.948 | 0.993 | 0.870 | 0.996 |
| 256 | 0.930 | 0.778 | 0.983 | 0.996 | 0.864 | 0.782 |
| 257 | 0.962 | 0.088 | 0.768 | 0.993 | 0.864 | 0.823 |
| 258 | 0.867 | 0.991 | 0.871 | 0.993 | 0.881 | 0.930 |
| 259 | 0.867 | 0.779 | 0.992 | 0.996 | 0.864 | 0.746 |
| 260 | 0.930 | 0.856 | 0.768 | 0.993 | 0.877 | 0.609 |
| 261 | 0.867 | 0.994 | 0.994 | 0.993 | 0.864 | 0.690 |
| 262 | 0.594 | 0.528 | 0.832 | 0.993 | 0.946 | 0.668 |
| 263 | 0.974 | 0.655 | 0.945 | 0.993 | 0.988 | 0.978 |
| 264 | 0.930 | 0.992 | 0.986 | 0.993 | 0.864 | 0.823 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); SZs, schizophrenia patients; SBs, siblings; HCs, healthy controls, FDR, False Discovery Rate.

### Table S4. Comparison of controllability between low and high antipsychotic doses patients under ‘0-back’ load. Note. Low antipsychotic doses, chlorpromazine ≤ 404mg; High antipsychotic doses, chlorpromazine > 404mg; Median antipsychotic dose, chlorpromazine = 404mg.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Average Controllability** | | | **Modal Controllability** | | |
| **t** | ***p*** | **FDR-*p*** | **t** | ***p*** | **FDR-*p*** |
| 1 | 2.666 | 0.008 | 0.563 | -3.073 | 0.002 | 0.115 |
| 2 | 0.438 | 0.662 | 0.874 | -1.871 | 0.063 | 0.355 |
| 3 | 0.684 | 0.495 | 0.833 | -1.992 | 0.048 | 0.311 |
| 4 | 1.048 | 0.296 | 0.692 | -1.831 | 0.069 | 0.364 |
| 5 | 0.494 | 0.622 | 0.874 | -1.965 | 0.051 | 0.316 |
| 6 | 0.028 | 0.978 | 0.989 | -0.917 | 0.361 | 0.635 |
| 7 | -3.337 | 0.001 | 0.278 | 0.739 | 0.461 | 0.680 |
| 8 | 0.111 | 0.912 | 0.981 | -1.881 | 0.062 | 0.355 |
| 9 | 1.159 | 0.248 | 0.658 | -2.175 | 0.031 | 0.298 |
| 10 | -0.112 | 0.911 | 0.981 | -2.012 | 0.046 | 0.311 |
| 11 | 0.857 | 0.393 | 0.789 | -1.666 | 0.098 | 0.403 |
| 12 | 0.968 | 0.334 | 0.730 | -1.503 | 0.135 | 0.429 |
| 13 | -1.062 | 0.290 | 0.689 | -0.776 | 0.439 | 0.663 |
| 14 | -0.650 | 0.517 | 0.833 | -1.235 | 0.219 | 0.493 |
| 15 | -2.094 | 0.038 | 0.563 | 0.452 | 0.652 | 0.788 |
| 16 | -0.682 | 0.496 | 0.833 | -0.495 | 0.621 | 0.766 |
| 17 | -1.010 | 0.314 | 0.721 | 0.457 | 0.648 | 0.788 |
| 18 | -0.507 | 0.613 | 0.871 | -1.329 | 0.186 | 0.463 |
| 19 | -1.570 | 0.118 | 0.588 | -0.361 | 0.719 | 0.821 |
| 20 | -0.346 | 0.730 | 0.921 | -0.527 | 0.599 | 0.757 |
| 21 | 1.718 | 0.088 | 0.588 | -2.100 | 0.037 | 0.311 |
| 22 | -0.553 | 0.581 | 0.869 | -1.403 | 0.163 | 0.447 |
| 23 | 0.842 | 0.401 | 0.797 | -2.376 | 0.019 | 0.298 |
| 24 | -0.324 | 0.746 | 0.923 | -1.457 | 0.147 | 0.431 |
| 25 | -0.819 | 0.414 | 0.805 | -0.148 | 0.883 | 0.917 |
| 26 | 0.352 | 0.725 | 0.921 | -1.346 | 0.180 | 0.463 |
| 27 | -0.012 | 0.990 | 0.990 | -1.660 | 0.099 | 0.403 |
| 28 | -1.621 | 0.107 | 0.588 | 0.458 | 0.648 | 0.788 |
| 29 | -0.466 | 0.642 | 0.874 | -0.746 | 0.457 | 0.678 |
| 30 | 0.016 | 0.987 | 0.990 | -0.537 | 0.592 | 0.756 |
| 31 | -0.333 | 0.740 | 0.923 | -0.867 | 0.387 | 0.647 |
| 32 | -0.130 | 0.897 | 0.981 | -0.894 | 0.373 | 0.643 |
| 33 | -0.149 | 0.882 | 0.970 | -0.749 | 0.455 | 0.678 |
| 34 | -1.880 | 0.062 | 0.563 | 0.241 | 0.810 | 0.873 |
| 35 | 0.541 | 0.589 | 0.869 | -1.496 | 0.137 | 0.430 |
| 36 | 0.018 | 0.985 | 0.990 | -0.965 | 0.336 | 0.612 |
| 37 | 0.101 | 0.919 | 0.981 | -1.659 | 0.099 | 0.403 |
| 38 | -0.571 | 0.569 | 0.868 | -0.976 | 0.330 | 0.610 |
| 39 | -1.524 | 0.130 | 0.588 | -0.028 | 0.978 | 0.978 |
| 40 | -2.474 | 0.014 | 0.563 | 1.014 | 0.312 | 0.588 |
| 41 | -0.747 | 0.456 | 0.833 | -0.676 | 0.500 | 0.702 |
| 42 | -1.672 | 0.096 | 0.588 | -0.687 | 0.493 | 0.698 |
| 43 | -1.074 | 0.284 | 0.685 | -1.328 | 0.186 | 0.463 |
| 44 | -0.442 | 0.659 | 0.874 | -0.809 | 0.420 | 0.647 |
| 45 | -1.382 | 0.169 | 0.647 | -0.669 | 0.504 | 0.704 |
| 46 | -0.919 | 0.359 | 0.741 | -0.338 | 0.736 | 0.830 |
| 47 | 0.449 | 0.654 | 0.874 | -1.094 | 0.275 | 0.551 |
| 48 | -1.360 | 0.176 | 0.652 | -0.587 | 0.558 | 0.748 |
| 49 | -1.169 | 0.244 | 0.658 | 0.633 | 0.528 | 0.724 |
| 50 | 0.416 | 0.678 | 0.883 | -1.283 | 0.201 | 0.477 |
| 51 | -1.249 | 0.213 | 0.658 | -1.072 | 0.285 | 0.561 |
| 52 | -1.536 | 0.126 | 0.588 | -0.562 | 0.575 | 0.755 |
| 53 | 0.280 | 0.780 | 0.930 | -1.662 | 0.098 | 0.403 |
| 54 | -0.740 | 0.460 | 0.833 | -0.814 | 0.417 | 0.647 |
| 55 | 0.202 | 0.840 | 0.952 | -2.007 | 0.046 | 0.311 |
| 56 | -1.152 | 0.251 | 0.658 | -0.414 | 0.680 | 0.797 |
| 57 | -1.812 | 0.072 | 0.563 | -0.685 | 0.494 | 0.698 |
| 58 | -0.581 | 0.562 | 0.868 | -0.712 | 0.478 | 0.693 |
| 59 | -1.120 | 0.264 | 0.665 | -0.304 | 0.761 | 0.841 |
| 60 | -0.578 | 0.564 | 0.868 | -0.566 | 0.572 | 0.755 |
| 61 | -1.572 | 0.118 | 0.588 | -0.433 | 0.666 | 0.788 |
| 62 | 0.537 | 0.592 | 0.869 | -1.724 | 0.087 | 0.403 |
| 63 | -1.958 | 0.052 | 0.563 | 0.593 | 0.554 | 0.746 |
| 64 | -1.574 | 0.117 | 0.588 | -0.900 | 0.369 | 0.642 |
| 65 | -1.353 | 0.178 | 0.652 | 0.259 | 0.796 | 0.872 |
| 66 | -1.880 | 0.062 | 0.563 | 0.544 | 0.587 | 0.756 |
| 67 | -0.055 | 0.956 | 0.989 | -1.518 | 0.131 | 0.421 |
| 68 | 0.393 | 0.695 | 0.899 | -1.563 | 0.120 | 0.406 |
| 69 | 0.082 | 0.935 | 0.983 | -1.627 | 0.106 | 0.403 |
| 70 | -2.132 | 0.035 | 0.563 | 0.353 | 0.725 | 0.821 |
| 71 | -1.373 | 0.172 | 0.648 | -0.694 | 0.489 | 0.698 |
| 72 | -1.131 | 0.260 | 0.665 | 0.313 | 0.755 | 0.837 |
| 73 | -1.541 | 0.125 | 0.588 | -0.355 | 0.723 | 0.821 |
| 74 | 0.506 | 0.613 | 0.871 | -1.303 | 0.195 | 0.476 |
| 75 | 1.303 | 0.194 | 0.658 | -1.343 | 0.181 | 0.463 |
| 76 | -0.690 | 0.492 | 0.833 | -0.538 | 0.591 | 0.756 |
| 77 | -0.854 | 0.394 | 0.789 | -0.848 | 0.398 | 0.647 |
| 78 | 1.272 | 0.205 | 0.658 | -2.237 | 0.027 | 0.298 |
| 79 | -0.940 | 0.349 | 0.730 | -0.189 | 0.851 | 0.899 |
| 80 | -2.604 | 0.010 | 0.563 | 0.566 | 0.572 | 0.755 |
| 81 | -1.203 | 0.231 | 0.658 | 0.173 | 0.863 | 0.903 |
| 82 | -2.036 | 0.043 | 0.563 | 0.067 | 0.947 | 0.965 |
| 83 | 1.798 | 0.074 | 0.563 | -2.623 | 0.010 | 0.250 |
| 84 | 1.459 | 0.147 | 0.614 | -2.823 | 0.005 | 0.177 |
| 85 | -1.967 | 0.051 | 0.563 | -0.207 | 0.836 | 0.890 |
| 86 | 0.747 | 0.456 | 0.833 | -1.335 | 0.184 | 0.463 |
| 87 | 1.830 | 0.069 | 0.563 | -2.271 | 0.025 | 0.298 |
| 88 | 0.666 | 0.506 | 0.833 | -1.482 | 0.140 | 0.431 |
| 89 | -1.194 | 0.234 | 0.658 | -0.700 | 0.485 | 0.698 |
| 90 | -1.667 | 0.098 | 0.588 | -0.510 | 0.611 | 0.764 |
| 91 | -0.220 | 0.826 | 0.952 | -0.867 | 0.387 | 0.647 |
| 92 | -1.099 | 0.273 | 0.674 | -0.130 | 0.897 | 0.922 |
| 93 | -1.159 | 0.248 | 0.658 | -0.542 | 0.589 | 0.756 |
| 94 | -2.528 | 0.012 | 0.563 | 0.924 | 0.357 | 0.635 |
| 95 | -1.124 | 0.263 | 0.665 | -0.169 | 0.866 | 0.903 |
| 96 | 1.552 | 0.123 | 0.588 | -1.759 | 0.081 | 0.401 |
| 97 | -0.111 | 0.911 | 0.981 | -1.190 | 0.236 | 0.523 |
| 98 | 1.179 | 0.240 | 0.658 | -1.734 | 0.085 | 0.403 |
| 99 | 0.711 | 0.478 | 0.833 | -2.008 | 0.046 | 0.311 |
| 100 | 1.234 | 0.219 | 0.658 | -1.323 | 0.188 | 0.463 |
| 101 | 0.531 | 0.596 | 0.869 | -2.168 | 0.032 | 0.298 |
| 102 | 0.093 | 0.926 | 0.981 | -1.461 | 0.146 | 0.431 |
| 103 | -0.161 | 0.872 | 0.964 | -1.118 | 0.265 | 0.545 |
| 104 | -1.508 | 0.134 | 0.588 | -0.027 | 0.978 | 0.978 |
| 105 | -0.648 | 0.518 | 0.833 | -0.873 | 0.384 | 0.647 |
| 106 | -0.233 | 0.816 | 0.952 | -0.907 | 0.366 | 0.640 |
| 107 | -0.865 | 0.388 | 0.789 | -0.859 | 0.392 | 0.647 |
| 108 | 0.161 | 0.872 | 0.964 | -1.400 | 0.163 | 0.447 |
| 109 | 0.056 | 0.956 | 0.989 | -1.660 | 0.099 | 0.403 |
| 110 | -0.416 | 0.678 | 0.883 | -1.403 | 0.162 | 0.447 |
| 111 | -0.322 | 0.748 | 0.923 | -1.592 | 0.113 | 0.406 |
| 112 | 1.301 | 0.195 | 0.658 | -2.101 | 0.037 | 0.311 |
| 113 | -1.174 | 0.242 | 0.658 | -0.855 | 0.394 | 0.647 |
| 114 | -0.292 | 0.770 | 0.929 | -1.115 | 0.266 | 0.545 |
| 115 | 0.737 | 0.462 | 0.833 | -1.879 | 0.062 | 0.355 |
| 116 | -0.521 | 0.603 | 0.871 | -0.775 | 0.440 | 0.663 |
| 117 | -0.297 | 0.767 | 0.929 | -0.852 | 0.396 | 0.647 |
| 118 | 0.473 | 0.637 | 0.874 | -1.390 | 0.166 | 0.448 |
| 119 | 0.307 | 0.759 | 0.929 | -1.695 | 0.092 | 0.403 |
| 120 | 1.286 | 0.200 | 0.658 | -1.259 | 0.210 | 0.478 |
| 121 | 1.169 | 0.244 | 0.658 | -1.908 | 0.058 | 0.349 |
| 122 | -0.986 | 0.326 | 0.730 | -1.124 | 0.263 | 0.545 |
| 123 | -1.436 | 0.153 | 0.615 | -0.567 | 0.572 | 0.755 |
| 124 | -1.600 | 0.112 | 0.588 | -0.730 | 0.466 | 0.684 |
| 125 | -1.144 | 0.254 | 0.658 | -0.446 | 0.656 | 0.788 |
| 126 | -1.425 | 0.156 | 0.615 | -1.345 | 0.180 | 0.463 |
| 127 | 0.639 | 0.524 | 0.833 | -1.349 | 0.179 | 0.463 |
| 128 | -0.819 | 0.414 | 0.805 | -0.129 | 0.898 | 0.922 |
| 129 | 0.352 | 0.725 | 0.921 | -0.824 | 0.411 | 0.647 |
| 130 | 0.221 | 0.826 | 0.952 | -1.414 | 0.159 | 0.447 |
| 131 | 0.804 | 0.423 | 0.805 | -2.173 | 0.031 | 0.298 |
| 132 | -1.694 | 0.092 | 0.588 | -0.275 | 0.784 | 0.862 |
| 133 | -0.473 | 0.637 | 0.874 | -0.395 | 0.693 | 0.797 |
| 134 | -1.304 | 0.194 | 0.658 | 0.172 | 0.864 | 0.903 |
| 135 | -1.535 | 0.127 | 0.588 | 0.246 | 0.806 | 0.873 |
| 136 | -2.167 | 0.032 | 0.563 | 0.438 | 0.662 | 0.788 |
| 137 | 1.002 | 0.318 | 0.724 | -2.058 | 0.041 | 0.311 |
| 138 | -0.802 | 0.424 | 0.805 | -0.631 | 0.529 | 0.724 |
| 139 | 0.178 | 0.859 | 0.964 | -1.274 | 0.205 | 0.478 |
| 140 | 1.154 | 0.250 | 0.658 | -2.038 | 0.043 | 0.311 |
| 141 | 0.032 | 0.974 | 0.989 | -1.268 | 0.207 | 0.478 |
| 142 | 0.441 | 0.660 | 0.874 | -1.015 | 0.312 | 0.588 |
| 143 | -0.940 | 0.349 | 0.730 | -0.855 | 0.394 | 0.647 |
| 144 | -1.600 | 0.112 | 0.588 | -0.622 | 0.535 | 0.724 |
| 145 | -0.969 | 0.334 | 0.730 | -0.436 | 0.663 | 0.788 |
| 146 | -0.703 | 0.483 | 0.833 | -0.772 | 0.441 | 0.663 |
| 147 | -0.601 | 0.549 | 0.862 | -1.077 | 0.283 | 0.561 |
| 148 | -1.248 | 0.214 | 0.658 | -0.397 | 0.692 | 0.797 |
| 149 | -0.711 | 0.478 | 0.833 | -0.837 | 0.404 | 0.647 |
| 150 | -1.971 | 0.050 | 0.563 | -0.232 | 0.817 | 0.877 |
| 151 | 0.104 | 0.918 | 0.981 | -1.591 | 0.114 | 0.406 |
| 152 | -1.597 | 0.112 | 0.588 | 0.252 | 0.802 | 0.873 |
| 153 | 0.451 | 0.653 | 0.874 | -1.545 | 0.124 | 0.415 |
| 154 | -0.540 | 0.590 | 0.869 | -1.573 | 0.118 | 0.406 |
| 155 | -0.655 | 0.513 | 0.833 | -0.554 | 0.580 | 0.756 |
| 156 | -1.975 | 0.050 | 0.563 | -0.331 | 0.741 | 0.832 |
| 157 | -1.593 | 0.113 | 0.588 | -0.498 | 0.619 | 0.766 |
| 158 | -0.712 | 0.477 | 0.833 | -1.590 | 0.114 | 0.406 |
| 159 | -1.162 | 0.247 | 0.658 | -0.536 | 0.593 | 0.756 |
| 160 | -1.907 | 0.058 | 0.563 | -0.657 | 0.512 | 0.712 |
| 161 | -0.204 | 0.839 | 0.952 | -1.698 | 0.091 | 0.403 |
| 162 | -1.495 | 0.137 | 0.593 | -0.528 | 0.598 | 0.757 |
| 163 | -1.278 | 0.203 | 0.658 | -1.149 | 0.252 | 0.545 |
| 164 | -0.573 | 0.568 | 0.868 | -1.535 | 0.127 | 0.415 |
| 165 | 0.699 | 0.485 | 0.833 | -2.169 | 0.032 | 0.298 |
| 166 | -1.228 | 0.221 | 0.658 | -0.521 | 0.603 | 0.758 |
| 167 | -1.635 | 0.104 | 0.588 | -0.400 | 0.689 | 0.797 |
| 168 | 0.698 | 0.486 | 0.833 | -2.070 | 0.040 | 0.311 |
| 169 | -1.183 | 0.239 | 0.658 | -0.934 | 0.352 | 0.632 |
| 170 | -1.301 | 0.195 | 0.658 | -0.696 | 0.487 | 0.698 |
| 171 | 0.095 | 0.924 | 0.981 | -1.567 | 0.119 | 0.406 |
| 172 | 0.165 | 0.869 | 0.964 | -1.532 | 0.127 | 0.415 |
| 173 | -0.254 | 0.800 | 0.943 | -1.622 | 0.107 | 0.403 |
| 174 | 1.318 | 0.189 | 0.658 | -2.283 | 0.024 | 0.298 |
| 175 | 1.754 | 0.081 | 0.588 | -3.224 | 0.002 | 0.115 |
| 176 | 0.331 | 0.741 | 0.923 | -0.980 | 0.328 | 0.610 |
| 177 | 0.635 | 0.526 | 0.833 | -1.990 | 0.048 | 0.311 |
| 178 | 0.536 | 0.593 | 0.869 | -1.134 | 0.259 | 0.545 |
| 179 | 1.426 | 0.156 | 0.615 | -1.788 | 0.076 | 0.385 |
| 180 | 0.928 | 0.355 | 0.738 | -2.372 | 0.019 | 0.298 |
| 181 | 1.982 | 0.049 | 0.563 | -2.081 | 0.039 | 0.311 |
| 182 | 0.946 | 0.345 | 0.730 | -2.289 | 0.023 | 0.298 |
| 183 | -1.015 | 0.311 | 0.721 | -1.282 | 0.202 | 0.477 |
| 184 | 0.116 | 0.908 | 0.981 | -1.181 | 0.239 | 0.526 |
| 185 | 1.524 | 0.130 | 0.588 | -2.998 | 0.003 | 0.119 |
| 186 | 0.220 | 0.826 | 0.952 | -1.134 | 0.258 | 0.545 |
| 187 | -0.211 | 0.833 | 0.952 | -1.258 | 0.210 | 0.478 |
| 188 | 2.039 | 0.043 | 0.563 | -3.180 | 0.002 | 0.115 |
| 189 | 0.970 | 0.334 | 0.730 | -2.017 | 0.045 | 0.311 |
| 190 | -0.455 | 0.650 | 0.874 | -0.427 | 0.670 | 0.790 |
| 191 | 0.335 | 0.738 | 0.923 | -0.831 | 0.407 | 0.647 |
| 192 | 0.492 | 0.623 | 0.874 | -0.990 | 0.324 | 0.606 |
| 193 | 0.957 | 0.340 | 0.730 | -1.401 | 0.163 | 0.447 |
| 194 | -0.414 | 0.679 | 0.883 | -0.628 | 0.531 | 0.724 |
| 195 | 0.634 | 0.527 | 0.833 | -1.962 | 0.052 | 0.316 |
| 196 | 0.706 | 0.481 | 0.833 | -1.844 | 0.067 | 0.362 |
| 197 | 2.372 | 0.019 | 0.563 | -3.057 | 0.003 | 0.115 |
| 198 | 1.459 | 0.147 | 0.614 | -2.593 | 0.010 | 0.250 |
| 199 | 0.683 | 0.496 | 0.833 | -1.655 | 0.100 | 0.403 |
| 200 | 2.067 | 0.040 | 0.563 | -3.151 | 0.002 | 0.115 |
| 201 | 1.825 | 0.070 | 0.563 | -2.458 | 0.015 | 0.298 |
| 202 | 1.993 | 0.048 | 0.563 | -2.765 | 0.006 | 0.187 |
| 203 | -1.629 | 0.105 | 0.588 | -0.433 | 0.665 | 0.788 |
| 204 | 0.052 | 0.959 | 0.989 | -1.121 | 0.264 | 0.545 |
| 205 | -0.467 | 0.641 | 0.874 | -1.202 | 0.231 | 0.517 |
| 206 | 0.540 | 0.590 | 0.869 | -1.050 | 0.295 | 0.569 |
| 207 | 1.050 | 0.295 | 0.692 | -2.200 | 0.029 | 0.298 |
| 208 | 0.047 | 0.963 | 0.989 | -1.609 | 0.110 | 0.406 |
| 209 | 1.151 | 0.252 | 0.658 | -1.333 | 0.185 | 0.463 |
| 210 | -0.448 | 0.655 | 0.874 | -1.143 | 0.255 | 0.545 |
| 211 | -0.876 | 0.382 | 0.783 | -0.771 | 0.442 | 0.663 |
| 212 | -0.303 | 0.762 | 0.929 | -1.648 | 0.101 | 0.403 |
| 213 | -1.207 | 0.229 | 0.658 | -0.829 | 0.408 | 0.647 |
| 214 | 1.940 | 0.054 | 0.563 | -3.531 | 0.001 | 0.115 |
| 215 | -1.743 | 0.083 | 0.588 | -0.130 | 0.897 | 0.922 |
| 216 | 0.181 | 0.856 | 0.964 | -1.296 | 0.197 | 0.477 |
| 217 | -1.268 | 0.207 | 0.658 | -0.806 | 0.421 | 0.647 |
| 218 | 0.948 | 0.344 | 0.730 | -2.184 | 0.030 | 0.298 |
| 219 | 0.787 | 0.433 | 0.811 | -2.259 | 0.025 | 0.298 |
| 220 | 1.867 | 0.064 | 0.563 | -2.236 | 0.027 | 0.298 |
| 221 | -0.811 | 0.419 | 0.805 | -0.624 | 0.534 | 0.724 |
| 222 | -0.072 | 0.943 | 0.988 | -1.468 | 0.144 | 0.431 |
| 223 | -1.426 | 0.156 | 0.615 | -0.318 | 0.751 | 0.837 |
| 224 | -0.661 | 0.510 | 0.833 | -0.918 | 0.360 | 0.635 |
| 225 | -1.072 | 0.285 | 0.685 | -0.499 | 0.619 | 0.766 |
| 226 | -0.042 | 0.967 | 0.989 | -1.459 | 0.146 | 0.431 |
| 227 | -2.273 | 0.024 | 0.563 | -0.245 | 0.807 | 0.873 |
| 228 | -1.924 | 0.056 | 0.563 | -0.033 | 0.974 | 0.978 |
| 229 | -1.674 | 0.096 | 0.588 | -1.104 | 0.271 | 0.547 |
| 230 | -2.181 | 0.031 | 0.563 | 0.050 | 0.960 | 0.971 |
| 231 | -1.257 | 0.211 | 0.658 | -1.053 | 0.294 | 0.569 |
| 232 | -3.114 | 0.002 | 0.289 | -0.050 | 0.960 | 0.971 |
| 233 | -1.081 | 0.281 | 0.685 | -0.815 | 0.416 | 0.647 |
| 234 | -1.509 | 0.133 | 0.588 | -0.822 | 0.412 | 0.647 |
| 235 | -1.795 | 0.075 | 0.563 | 0.941 | 0.348 | 0.629 |
| 236 | -0.226 | 0.822 | 0.952 | -1.488 | 0.139 | 0.431 |
| 237 | -2.039 | 0.043 | 0.563 | -0.086 | 0.931 | 0.953 |
| 238 | -1.104 | 0.271 | 0.674 | -0.726 | 0.469 | 0.684 |
| 239 | 0.292 | 0.770 | 0.929 | -1.644 | 0.102 | 0.403 |
| 240 | -1.251 | 0.213 | 0.658 | 0.318 | 0.751 | 0.837 |
| 241 | 0.089 | 0.930 | 0.982 | -1.626 | 0.106 | 0.403 |
| 242 | 0.377 | 0.706 | 0.909 | -2.286 | 0.024 | 0.298 |
| 243 | -0.050 | 0.960 | 0.989 | -1.069 | 0.287 | 0.561 |
| 244 | -1.802 | 0.073 | 0.563 | 0.188 | 0.851 | 0.899 |
| 245 | -0.209 | 0.834 | 0.952 | -1.708 | 0.090 | 0.403 |
| 246 | 0.279 | 0.781 | 0.930 | -2.027 | 0.044 | 0.311 |
| 247 | -1.400 | 0.163 | 0.634 | -1.107 | 0.270 | 0.547 |
| 248 | -1.872 | 0.063 | 0.563 | -0.454 | 0.650 | 0.788 |
| 249 | -0.814 | 0.417 | 0.805 | -0.828 | 0.409 | 0.647 |
| 250 | 0.031 | 0.975 | 0.989 | -1.582 | 0.116 | 0.406 |
| 251 | 0.514 | 0.608 | 0.871 | -0.968 | 0.335 | 0.612 |
| 252 | -0.634 | 0.527 | 0.833 | -1.152 | 0.251 | 0.545 |
| 253 | 0.170 | 0.865 | 0.964 | -1.731 | 0.085 | 0.403 |
| 254 | 0.373 | 0.710 | 0.909 | -2.193 | 0.030 | 0.298 |
| 255 | -0.454 | 0.650 | 0.874 | -1.280 | 0.203 | 0.477 |
| 256 | -0.585 | 0.559 | 0.868 | -0.394 | 0.694 | 0.797 |
| 257 | -0.947 | 0.345 | 0.730 | -1.023 | 0.308 | 0.588 |
| 258 | 0.659 | 0.511 | 0.833 | -1.397 | 0.164 | 0.447 |
| 259 | 0.277 | 0.782 | 0.930 | -0.887 | 0.377 | 0.646 |
| 260 | 0.786 | 0.433 | 0.811 | -1.803 | 0.073 | 0.379 |
| 261 | 0.538 | 0.591 | 0.869 | -1.852 | 0.066 | 0.362 |
| 262 | -0.715 | 0.475 | 0.833 | -1.424 | 0.156 | 0.447 |
| 263 | -0.257 | 0.798 | 0.943 | -0.225 | 0.822 | 0.879 |
| 264 | -0.508 | 0.612 | 0.871 | -0.402 | 0.688 | 0.797 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); SZs, schizophrenia patients; FDR, False Discovery Rate.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S5. Comparison of controllability between low and high antipsychotic doses patients under ‘2-back’ load. Note. Low antipsychotic doses, chlorpromazine ≤ 404mg; High antipsychotic doses, chlorpromazine > 404mg; Median antipsychotics dose, chlorpromazine = 404mg.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Average Controllability** | | | **Modal Controllability** | | |
| **t** | ***p*** | **FDR-*p*** | **t** | ***p*** | **FDR-*p*** |
| 1 | -2.805 | 0.006 | 0.528 | 2.465 | 0.015 | 0.991 |
| 2 | 0.742 | 0.459 | 0.937 | 0.257 | 0.797 | 0.991 |
| 3 | -0.632 | 0.528 | 0.951 | 0.761 | 0.448 | 0.991 |
| 4 | -0.085 | 0.932 | 1.000 | 0.272 | 0.786 | 0.991 |
| 5 | -1.859 | 0.066 | 0.880 | 0.989 | 0.324 | 0.991 |
| 6 | 0.620 | 0.536 | 0.951 | 0.609 | 0.543 | 0.991 |
| 7 | -0.046 | 0.964 | 1.000 | 0.684 | 0.495 | 0.991 |
| 8 | -0.336 | 0.737 | 0.981 | 1.493 | 0.137 | 0.991 |
| 9 | -0.122 | 0.903 | 1.000 | 0.551 | 0.582 | 0.991 |
| 10 | 0.555 | 0.580 | 0.951 | -0.281 | 0.779 | 0.991 |
| 11 | -0.588 | 0.557 | 0.951 | 1.051 | 0.295 | 0.991 |
| 12 | -0.320 | 0.749 | 0.981 | 0.113 | 0.910 | 0.991 |
| 13 | 0.593 | 0.554 | 0.951 | 0.337 | 0.737 | 0.991 |
| 14 | -0.137 | 0.891 | 1.000 | -0.220 | 0.826 | 0.991 |
| 15 | 0.885 | 0.377 | 0.910 | 0.096 | 0.924 | 0.991 |
| 16 | 0.821 | 0.413 | 0.937 | 0.199 | 0.842 | 0.991 |
| 17 | 0.173 | 0.863 | 1.000 | -0.354 | 0.724 | 0.991 |
| 18 | -0.810 | 0.419 | 0.937 | 1.283 | 0.201 | 0.991 |
| 19 | -0.518 | 0.606 | 0.951 | 0.210 | 0.834 | 0.991 |
| 20 | 0.562 | 0.575 | 0.951 | -0.003 | 0.997 | 0.997 |
| 21 | -0.524 | 0.601 | 0.951 | 0.550 | 0.583 | 0.991 |
| 22 | -0.982 | 0.328 | 0.910 | 1.345 | 0.181 | 0.991 |
| 23 | 1.205 | 0.230 | 0.910 | 0.383 | 0.703 | 0.991 |
| 24 | 0.837 | 0.404 | 0.936 | -0.087 | 0.931 | 0.991 |
| 25 | 0.089 | 0.929 | 1.000 | 0.157 | 0.876 | 0.991 |
| 26 | 1.031 | 0.304 | 0.910 | 0.307 | 0.759 | 0.991 |
| 27 | 0.036 | 0.971 | 1.000 | 0.345 | 0.730 | 0.991 |
| 28 | 0.722 | 0.471 | 0.937 | -0.064 | 0.949 | 0.991 |
| 29 | 0.273 | 0.785 | 0.984 | 0.122 | 0.903 | 0.991 |
| 30 | -0.171 | 0.865 | 1.000 | 0.899 | 0.370 | 0.991 |
| 31 | 0.155 | 0.877 | 1.000 | 0.525 | 0.600 | 0.991 |
| 32 | 0.453 | 0.651 | 0.953 | 0.582 | 0.561 | 0.991 |
| 33 | 0.135 | 0.893 | 1.000 | 0.651 | 0.516 | 0.991 |
| 34 | 1.929 | 0.056 | 0.880 | -0.872 | 0.385 | 0.991 |
| 35 | 1.311 | 0.192 | 0.905 | 0.117 | 0.907 | 0.991 |
| 36 | 0.749 | 0.455 | 0.937 | -0.258 | 0.797 | 0.991 |
| 37 | 0.499 | 0.618 | 0.953 | -0.130 | 0.896 | 0.991 |
| 38 | -0.105 | 0.916 | 1.000 | 0.692 | 0.490 | 0.991 |
| 39 | 0.926 | 0.356 | 0.910 | -0.194 | 0.847 | 0.991 |
| 40 | 2.088 | 0.038 | 0.880 | -1.059 | 0.291 | 0.991 |
| 41 | 0.642 | 0.522 | 0.951 | -0.153 | 0.879 | 0.991 |
| 42 | -0.002 | 0.998 | 1.000 | 0.262 | 0.794 | 0.991 |
| 43 | -1.189 | 0.236 | 0.910 | 0.868 | 0.387 | 0.991 |
| 44 | -0.448 | 0.655 | 0.953 | 0.776 | 0.439 | 0.991 |
| 45 | 0.992 | 0.323 | 0.910 | -0.393 | 0.695 | 0.991 |
| 46 | 0.917 | 0.360 | 0.910 | -0.540 | 0.590 | 0.991 |
| 47 | -0.721 | 0.472 | 0.937 | -0.004 | 0.997 | 0.997 |
| 48 | -0.628 | 0.531 | 0.951 | 1.363 | 0.175 | 0.991 |
| 49 | -0.943 | 0.347 | 0.910 | 1.330 | 0.186 | 0.991 |
| 50 | -1.827 | 0.070 | 0.880 | 1.122 | 0.263 | 0.991 |
| 51 | 0.525 | 0.600 | 0.951 | 0.306 | 0.760 | 0.991 |
| 52 | -0.118 | 0.906 | 1.000 | 0.036 | 0.971 | 0.991 |
| 53 | -1.079 | 0.282 | 0.910 | 1.432 | 0.154 | 0.991 |
| 54 | -0.882 | 0.379 | 0.910 | 1.187 | 0.237 | 0.991 |
| 55 | -1.060 | 0.291 | 0.910 | 1.448 | 0.150 | 0.991 |
| 56 | -1.559 | 0.121 | 0.905 | 1.959 | 0.052 | 0.991 |
| 57 | 0.341 | 0.734 | 0.981 | 0.498 | 0.619 | 0.991 |
| 58 | -0.981 | 0.328 | 0.910 | 1.409 | 0.161 | 0.991 |
| 59 | 0.037 | 0.971 | 1.000 | 0.697 | 0.487 | 0.991 |
| 60 | -0.731 | 0.466 | 0.937 | 1.441 | 0.152 | 0.991 |
| 61 | 0.857 | 0.393 | 0.926 | -0.286 | 0.776 | 0.991 |
| 62 | -0.295 | 0.769 | 0.984 | 1.380 | 0.170 | 0.991 |
| 63 | 1.804 | 0.073 | 0.880 | -1.125 | 0.262 | 0.991 |
| 64 | -0.032 | 0.975 | 1.000 | 0.537 | 0.592 | 0.991 |
| 65 | 0.765 | 0.445 | 0.937 | -0.391 | 0.696 | 0.991 |
| 66 | 0.476 | 0.635 | 0.953 | -0.246 | 0.806 | 0.991 |
| 67 | 0.257 | 0.798 | 0.984 | -0.084 | 0.933 | 0.991 |
| 68 | -2.772 | 0.006 | 0.528 | 2.005 | 0.047 | 0.991 |
| 69 | -0.476 | 0.635 | 0.953 | 0.393 | 0.695 | 0.991 |
| 70 | -0.422 | 0.674 | 0.968 | 1.092 | 0.276 | 0.991 |
| 71 | 0.927 | 0.356 | 0.910 | -0.063 | 0.950 | 0.991 |
| 72 | 0.445 | 0.657 | 0.953 | -0.305 | 0.760 | 0.991 |
| 73 | -0.136 | 0.892 | 1.000 | 0.663 | 0.508 | 0.991 |
| 74 | 1.416 | 0.159 | 0.905 | -0.169 | 0.866 | 0.991 |
| 75 | -0.198 | 0.843 | 1.000 | -0.101 | 0.920 | 0.991 |
| 76 | -0.692 | 0.490 | 0.951 | 0.362 | 0.718 | 0.991 |
| 77 | 0.586 | 0.559 | 0.951 | -0.269 | 0.788 | 0.991 |
| 78 | -0.556 | 0.579 | 0.951 | 0.145 | 0.885 | 0.991 |
| 79 | 1.568 | 0.119 | 0.905 | -0.050 | 0.960 | 0.991 |
| 80 | -0.391 | 0.696 | 0.977 | 1.378 | 0.170 | 0.991 |
| 81 | 1.000 | 0.319 | 0.910 | -0.228 | 0.820 | 0.991 |
| 82 | -0.318 | 0.751 | 0.981 | 0.903 | 0.368 | 0.991 |
| 83 | -0.495 | 0.621 | 0.953 | 1.711 | 0.089 | 0.991 |
| 84 | -0.692 | 0.490 | 0.951 | 2.021 | 0.045 | 0.991 |
| 85 | 0.056 | 0.956 | 1.000 | 0.383 | 0.702 | 0.991 |
| 86 | 0.338 | 0.736 | 0.981 | 0.416 | 0.678 | 0.991 |
| 87 | 0.953 | 0.342 | 0.910 | 0.374 | 0.709 | 0.991 |
| 88 | 0.536 | 0.593 | 0.951 | 0.349 | 0.728 | 0.991 |
| 89 | 0.267 | 0.790 | 0.984 | 0.991 | 0.323 | 0.991 |
| 90 | 1.459 | 0.147 | 0.905 | -0.669 | 0.504 | 0.991 |
| 91 | 1.481 | 0.141 | 0.905 | 0.059 | 0.953 | 0.991 |
| 92 | 0.918 | 0.360 | 0.910 | 0.041 | 0.967 | 0.991 |
| 93 | 1.401 | 0.163 | 0.905 | -0.903 | 0.368 | 0.991 |
| 94 | 2.226 | 0.027 | 0.821 | -0.951 | 0.343 | 0.991 |
| 95 | 1.693 | 0.092 | 0.900 | -0.717 | 0.475 | 0.991 |
| 96 | -0.271 | 0.787 | 0.984 | 0.641 | 0.522 | 0.991 |
| 97 | 1.589 | 0.114 | 0.905 | -0.199 | 0.842 | 0.991 |
| 98 | 0.009 | 0.993 | 1.000 | 0.805 | 0.422 | 0.991 |
| 99 | 0.010 | 0.992 | 1.000 | 1.181 | 0.239 | 0.991 |
| 100 | 0.480 | 0.632 | 0.953 | 0.560 | 0.577 | 0.991 |
| 101 | 1.193 | 0.235 | 0.910 | 0.513 | 0.609 | 0.991 |
| 102 | 0.570 | 0.570 | 0.951 | 0.109 | 0.914 | 0.991 |
| 103 | 0.921 | 0.359 | 0.910 | 0.089 | 0.929 | 0.991 |
| 104 | 1.915 | 0.057 | 0.880 | -0.742 | 0.459 | 0.991 |
| 105 | 1.534 | 0.127 | 0.905 | -0.727 | 0.469 | 0.991 |
| 106 | 0.119 | 0.905 | 1.000 | 0.332 | 0.741 | 0.991 |
| 107 | 1.912 | 0.058 | 0.880 | -0.536 | 0.593 | 0.991 |
| 108 | 0.577 | 0.565 | 0.951 | 0.009 | 0.993 | 0.997 |
| 109 | 1.164 | 0.246 | 0.910 | 0.493 | 0.623 | 0.991 |
| 110 | 1.784 | 0.076 | 0.880 | -0.262 | 0.793 | 0.991 |
| 111 | 0.545 | 0.587 | 0.951 | 0.268 | 0.789 | 0.991 |
| 112 | -0.262 | 0.794 | 0.984 | 0.615 | 0.540 | 0.991 |
| 113 | 2.235 | 0.027 | 0.821 | -0.642 | 0.522 | 0.991 |
| 114 | 0.796 | 0.428 | 0.937 | -0.367 | 0.714 | 0.991 |
| 115 | 1.878 | 0.062 | 0.880 | -0.897 | 0.371 | 0.991 |
| 116 | -0.114 | 0.909 | 1.000 | 0.219 | 0.827 | 0.991 |
| 117 | 0.647 | 0.519 | 0.951 | -0.196 | 0.845 | 0.991 |
| 118 | -0.141 | 0.888 | 1.000 | 0.967 | 0.335 | 0.991 |
| 119 | -1.993 | 0.048 | 0.880 | 1.913 | 0.058 | 0.991 |
| 120 | -1.334 | 0.185 | 0.905 | 2.401 | 0.018 | 0.991 |
| 121 | -0.840 | 0.402 | 0.936 | 1.268 | 0.207 | 0.991 |
| 122 | 0.614 | 0.540 | 0.951 | 0.185 | 0.853 | 0.991 |
| 123 | 0.617 | 0.538 | 0.951 | -0.163 | 0.870 | 0.991 |
| 124 | 1.248 | 0.214 | 0.910 | -1.073 | 0.285 | 0.991 |
| 125 | -0.936 | 0.351 | 0.910 | 1.532 | 0.128 | 0.991 |
| 126 | -0.147 | 0.884 | 1.000 | 0.990 | 0.324 | 0.991 |
| 127 | -0.221 | 0.825 | 1.000 | 0.655 | 0.514 | 0.991 |
| 128 | -0.363 | 0.717 | 0.981 | 0.814 | 0.417 | 0.991 |
| 129 | 0.810 | 0.419 | 0.937 | -0.255 | 0.799 | 0.991 |
| 130 | -0.466 | 0.642 | 0.953 | 0.734 | 0.464 | 0.991 |
| 131 | 1.124 | 0.263 | 0.910 | -0.156 | 0.876 | 0.991 |
| 132 | -0.522 | 0.602 | 0.951 | 1.215 | 0.226 | 0.991 |
| 133 | 2.216 | 0.028 | 0.821 | -0.959 | 0.339 | 0.991 |
| 134 | 0.197 | 0.844 | 1.000 | 0.061 | 0.952 | 0.991 |
| 135 | -0.142 | 0.887 | 1.000 | 0.685 | 0.494 | 0.991 |
| 136 | 0.727 | 0.468 | 0.937 | -0.082 | 0.935 | 0.991 |
| 137 | -0.912 | 0.363 | 0.910 | 0.901 | 0.369 | 0.991 |
| 138 | -0.526 | 0.600 | 0.951 | 0.765 | 0.445 | 0.991 |
| 139 | 0.904 | 0.368 | 0.910 | -0.182 | 0.856 | 0.991 |
| 140 | -0.369 | 0.712 | 0.981 | 0.758 | 0.450 | 0.991 |
| 141 | 1.176 | 0.241 | 0.910 | -0.379 | 0.705 | 0.991 |
| 142 | -1.332 | 0.185 | 0.905 | 1.910 | 0.058 | 0.991 |
| 143 | 0.010 | 0.992 | 1.000 | 0.381 | 0.704 | 0.991 |
| 144 | 0.448 | 0.655 | 0.953 | -0.177 | 0.859 | 0.991 |
| 145 | -0.048 | 0.962 | 1.000 | -0.016 | 0.987 | 0.997 |
| 146 | 0.068 | 0.946 | 1.000 | 0.114 | 0.910 | 0.991 |
| 147 | 0.093 | 0.926 | 1.000 | -0.232 | 0.817 | 0.991 |
| 148 | 0.898 | 0.371 | 0.910 | -0.673 | 0.502 | 0.991 |
| 149 | 1.002 | 0.318 | 0.910 | -0.753 | 0.453 | 0.991 |
| 150 | 0.212 | 0.833 | 1.000 | 0.231 | 0.817 | 0.991 |
| 151 | -0.280 | 0.780 | 0.984 | 0.799 | 0.425 | 0.991 |
| 152 | -0.256 | 0.798 | 0.984 | -0.053 | 0.958 | 0.991 |
| 153 | -0.660 | 0.510 | 0.951 | 1.006 | 0.316 | 0.991 |
| 154 | -2.030 | 0.044 | 0.880 | 1.820 | 0.071 | 0.991 |
| 155 | 1.082 | 0.281 | 0.910 | -0.698 | 0.486 | 0.991 |
| 156 | 0.570 | 0.570 | 0.951 | -0.735 | 0.464 | 0.991 |
| 157 | 0.187 | 0.852 | 1.000 | 0.152 | 0.880 | 0.991 |
| 158 | -0.419 | 0.676 | 0.968 | 0.400 | 0.689 | 0.991 |
| 159 | 0.476 | 0.635 | 0.953 | -0.720 | 0.472 | 0.991 |
| 160 | 0.446 | 0.656 | 0.953 | 0.089 | 0.929 | 0.991 |
| 161 | -1.406 | 0.163 | 0.905 | 1.630 | 0.105 | 0.991 |
| 162 | 0.673 | 0.502 | 0.951 | -0.274 | 0.784 | 0.991 |
| 163 | 0.903 | 0.368 | 0.910 | -0.650 | 0.517 | 0.991 |
| 164 | -0.101 | 0.919 | 1.000 | 0.544 | 0.587 | 0.991 |
| 165 | 0.000 | 1.000 | 1.000 | 0.758 | 0.450 | 0.991 |
| 166 | 0.617 | 0.538 | 0.951 | -0.215 | 0.830 | 0.991 |
| 167 | -0.082 | 0.935 | 1.000 | -0.259 | 0.796 | 0.991 |
| 168 | -1.763 | 0.080 | 0.880 | 1.681 | 0.095 | 0.991 |
| 169 | -0.744 | 0.458 | 0.937 | 0.764 | 0.446 | 0.991 |
| 170 | 0.738 | 0.462 | 0.937 | -0.703 | 0.483 | 0.991 |
| 171 | -0.936 | 0.351 | 0.910 | 0.755 | 0.451 | 0.991 |
| 172 | -1.706 | 0.090 | 0.900 | 1.426 | 0.156 | 0.991 |
| 173 | -1.071 | 0.286 | 0.910 | 1.546 | 0.124 | 0.991 |
| 174 | -1.731 | 0.085 | 0.898 | 1.329 | 0.186 | 0.991 |
| 175 | 0.309 | 0.758 | 0.981 | 0.418 | 0.676 | 0.991 |
| 176 | -1.008 | 0.315 | 0.910 | 1.548 | 0.124 | 0.991 |
| 177 | -1.168 | 0.245 | 0.910 | 1.452 | 0.148 | 0.991 |
| 178 | 0.345 | 0.731 | 0.981 | 0.318 | 0.751 | 0.991 |
| 179 | -1.379 | 0.170 | 0.905 | 1.542 | 0.125 | 0.991 |
| 180 | -1.566 | 0.119 | 0.905 | 0.860 | 0.391 | 0.991 |
| 181 | -1.145 | 0.254 | 0.910 | 1.075 | 0.284 | 0.991 |
| 182 | -3.234 | 0.002 | 0.528 | 1.870 | 0.063 | 0.991 |
| 183 | -0.520 | 0.604 | 0.951 | 1.683 | 0.094 | 0.991 |
| 184 | -0.496 | 0.621 | 0.953 | 1.192 | 0.235 | 0.991 |
| 185 | -0.731 | 0.466 | 0.937 | 1.434 | 0.154 | 0.991 |
| 186 | -0.898 | 0.371 | 0.910 | 1.466 | 0.145 | 0.991 |
| 187 | -2.233 | 0.027 | 0.821 | 1.704 | 0.090 | 0.991 |
| 188 | -1.451 | 0.149 | 0.905 | 1.644 | 0.102 | 0.991 |
| 189 | 0.107 | 0.915 | 1.000 | 0.518 | 0.605 | 0.991 |
| 190 | -1.576 | 0.117 | 0.905 | 1.589 | 0.114 | 0.991 |
| 191 | -1.597 | 0.112 | 0.905 | 0.591 | 0.555 | 0.991 |
| 192 | -0.915 | 0.361 | 0.910 | 0.895 | 0.372 | 0.991 |
| 193 | -0.403 | 0.687 | 0.970 | 0.691 | 0.490 | 0.991 |
| 194 | -1.141 | 0.256 | 0.910 | 0.641 | 0.522 | 0.991 |
| 195 | -1.364 | 0.175 | 0.905 | 1.948 | 0.053 | 0.991 |
| 196 | -0.724 | 0.470 | 0.937 | 1.800 | 0.074 | 0.991 |
| 197 | 0.363 | 0.717 | 0.981 | 0.629 | 0.530 | 0.991 |
| 198 | 0.212 | 0.832 | 1.000 | 0.637 | 0.525 | 0.991 |
| 199 | -1.764 | 0.080 | 0.880 | 0.755 | 0.452 | 0.991 |
| 200 | -0.688 | 0.493 | 0.951 | 1.296 | 0.197 | 0.991 |
| 201 | -1.642 | 0.103 | 0.905 | 1.309 | 0.193 | 0.991 |
| 202 | 1.317 | 0.190 | 0.905 | -0.502 | 0.617 | 0.991 |
| 203 | 0.908 | 0.366 | 0.910 | 0.338 | 0.736 | 0.991 |
| 204 | -1.391 | 0.166 | 0.905 | 2.324 | 0.021 | 0.991 |
| 205 | -0.184 | 0.854 | 1.000 | 1.239 | 0.217 | 0.991 |
| 206 | 0.771 | 0.442 | 0.937 | -0.034 | 0.973 | 0.991 |
| 207 | -0.026 | 0.979 | 1.000 | 0.284 | 0.777 | 0.991 |
| 208 | -1.347 | 0.180 | 0.905 | 1.735 | 0.085 | 0.991 |
| 209 | -0.932 | 0.353 | 0.910 | 1.267 | 0.207 | 0.991 |
| 210 | 0.119 | 0.906 | 1.000 | 0.452 | 0.652 | 0.991 |
| 211 | 0.866 | 0.388 | 0.923 | -0.124 | 0.901 | 0.991 |
| 212 | 0.373 | 0.710 | 0.981 | 0.030 | 0.976 | 0.991 |
| 213 | -0.906 | 0.366 | 0.910 | 1.404 | 0.162 | 0.991 |
| 214 | -1.002 | 0.318 | 0.910 | 1.639 | 0.103 | 0.991 |
| 215 | 0.884 | 0.378 | 0.910 | 0.188 | 0.851 | 0.991 |
| 216 | 0.760 | 0.448 | 0.937 | 0.037 | 0.971 | 0.991 |
| 217 | 0.935 | 0.351 | 0.910 | 0.340 | 0.734 | 0.991 |
| 218 | 0.034 | 0.973 | 1.000 | 0.906 | 0.367 | 0.991 |
| 219 | 0.595 | 0.553 | 0.951 | 0.283 | 0.778 | 0.991 |
| 220 | -0.009 | 0.993 | 1.000 | 0.462 | 0.645 | 0.991 |
| 221 | 1.899 | 0.059 | 0.880 | -0.974 | 0.331 | 0.991 |
| 222 | 0.598 | 0.551 | 0.951 | 0.212 | 0.832 | 0.991 |
| 223 | 1.467 | 0.144 | 0.905 | -0.645 | 0.520 | 0.991 |
| 224 | 1.210 | 0.228 | 0.910 | -0.525 | 0.600 | 0.991 |
| 225 | 0.527 | 0.599 | 0.951 | 0.504 | 0.615 | 0.991 |
| 226 | -0.308 | 0.758 | 0.981 | 0.830 | 0.408 | 0.991 |
| 227 | -0.316 | 0.753 | 0.981 | 0.928 | 0.355 | 0.991 |
| 228 | 0.512 | 0.609 | 0.951 | 0.333 | 0.740 | 0.991 |
| 229 | 1.057 | 0.292 | 0.910 | -0.546 | 0.586 | 0.991 |
| 230 | 0.591 | 0.556 | 0.951 | -0.239 | 0.811 | 0.991 |
| 231 | 0.215 | 0.830 | 1.000 | -0.200 | 0.842 | 0.991 |
| 232 | 1.162 | 0.247 | 0.910 | -0.234 | 0.815 | 0.991 |
| 233 | 2.336 | 0.021 | 0.821 | -1.404 | 0.162 | 0.991 |
| 234 | 1.433 | 0.154 | 0.905 | -0.488 | 0.626 | 0.991 |
| 235 | 0.360 | 0.719 | 0.981 | -0.106 | 0.916 | 0.991 |
| 236 | -0.944 | 0.347 | 0.910 | 1.310 | 0.192 | 0.991 |
| 237 | 0.140 | 0.889 | 1.000 | -0.177 | 0.859 | 0.991 |
| 238 | -0.075 | 0.940 | 1.000 | 0.341 | 0.734 | 0.991 |
| 239 | -1.176 | 0.242 | 0.910 | 1.986 | 0.049 | 0.991 |
| 240 | 0.062 | 0.950 | 1.000 | 0.359 | 0.720 | 0.991 |
| 241 | 0.801 | 0.424 | 0.937 | -0.696 | 0.488 | 0.991 |
| 242 | 0.315 | 0.753 | 0.981 | 0.215 | 0.830 | 0.991 |
| 243 | -0.780 | 0.437 | 0.937 | 1.053 | 0.294 | 0.991 |
| 244 | -0.140 | 0.888 | 1.000 | 0.725 | 0.470 | 0.991 |
| 245 | -1.383 | 0.169 | 0.905 | 1.227 | 0.222 | 0.991 |
| 246 | -0.894 | 0.373 | 0.910 | 0.973 | 0.332 | 0.991 |
| 247 | -0.995 | 0.321 | 0.910 | 0.733 | 0.465 | 0.991 |
| 248 | -0.009 | 0.992 | 1.000 | 0.579 | 0.563 | 0.991 |
| 249 | -0.358 | 0.721 | 0.981 | 0.665 | 0.507 | 0.991 |
| 250 | -0.417 | 0.678 | 0.968 | 0.626 | 0.532 | 0.991 |
| 251 | -1.012 | 0.313 | 0.910 | 0.467 | 0.641 | 0.991 |
| 252 | -0.271 | 0.787 | 0.984 | 1.338 | 0.183 | 0.991 |
| 253 | -0.410 | 0.682 | 0.968 | 0.993 | 0.322 | 0.991 |
| 254 | -1.427 | 0.156 | 0.905 | 1.647 | 0.102 | 0.991 |
| 255 | -1.939 | 0.055 | 0.880 | 2.228 | 0.028 | 0.991 |
| 256 | -1.638 | 0.103 | 0.905 | 0.984 | 0.327 | 0.991 |
| 257 | -0.246 | 0.806 | 0.990 | 1.140 | 0.256 | 0.991 |
| 258 | -0.581 | 0.562 | 0.951 | 1.050 | 0.295 | 0.991 |
| 259 | -0.936 | 0.351 | 0.910 | 0.808 | 0.420 | 0.991 |
| 260 | -2.447 | 0.016 | 0.821 | 1.715 | 0.088 | 0.991 |
| 261 | -1.167 | 0.245 | 0.910 | 0.798 | 0.426 | 0.991 |
| 262 | -1.317 | 0.190 | 0.905 | 1.572 | 0.118 | 0.991 |
| 263 | -0.283 | 0.777 | 0.984 | 0.970 | 0.334 | 0.991 |
| 264 | -1.371 | 0.173 | 0.905 | 1.423 | 0.157 | 0.991 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); SZs, schizophrenia patients; FDR, False Discovery Rate.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S6. Correlation analysis between the detected modal controllability, neurocognitive performances, and clinical characteristics in schizophrenia under ‘0-back’ load.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Network** | **WAIS-CR Digit Symbol** | | | **WAIS-CR Information** | | | **Accuracy of 0-back** | | | **Response Time of 0-back** | | | **SAPS** | | | **SANS** | | | **Illness Duration** | | | **Treatment Dosage** | | |
| **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** |
| 83 | DMN | 0.091 | 0.316 | 0.778 | 0.015 | 0.868 | 0.926 | 0.180 | 0.046\* | 0.294 | -0.170 | 0.059 | 0.315 | 0.092 | 0.313 | 0.778 | 0.009 | 0.924 | 0.947 | -0.049 | 0.594 | 0.844 | -0.194 | 0.031\* | 0.288 |
| 102 | DMN | 0.108 | 0.233 | 0.678 | 0.125 | 0.170 | 0.604 | 0.150 | 0.098 | 0.448 | -0.189 | 0.036\* | 0.288 | 0.047 | 0.609 | 0.844 | -0.074 | 0.416 | 0.832 | -0.086 | 0.342 | 0.782 | -0.049 | 0.590 | 0.844 |
| 181 | FPN | 0.021 | 0.821 | 0.906 | 0.050 | 0.581 | 0.844 | -0.024 | 0.790 | 0.903 | 0.040 | 0.664 | 0.850 | 0.043 | 0.633 | 0.844 | -0.061 | 0.502 | 0.844 | -0.113 | 0.213 | 0.678 | -0.236 | 0.009\* | 0.144 |
| 84 | Uncertain | 0.027 | 0.765 | 0.903 | 0.060 | 0.507 | 0.844 | 0.006 | 0.947 | 0.947 | -0.127 | 0.163 | 0.604 | 0.034 | 0.713 | 0.878 | -0.062 | 0.496 | 0.844 | -0.080 | 0.382 | 0.815 | -0.269 | 0.003\* | 0.096 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); DMN, Default Mode Network; FPN, Fronto-parietal Task Control Network; ROI, regions of interest; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; WAIS-CR, Wechsler Adult Intelligence Scale-Chinese Revised.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S7. Correlation analysis between the detected modal controllability, neurocognitive performances, and clinical characteristics in schizophrenia under ‘2-back’ load.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Network** | **WAIS-Digit Symbol** | | | **WAIS-Information** | | | **Accuracy of 2-back** | | | **Response Time of 2-back** | | | **SAPS** | | | **SANS** | | | **Illness Duration** | | | **Treatment Dosage** | | |
| **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** |
| 79 | DMN | 0.035 | 0.706 | 0.932 | 0.073 | 0.427 | 0.906 | 0.233 | 0.010\* | 0.475 | -0.061 | 0.509 | 0.932 | -0.055 | 0.547 | 0.932 | -0.015 | 0.867 | 0.982 | 0.090 | 0.327 | 0.826 | -0.033 | 0.716 | 0.934 |
| 83 | DMN | 0.055 | 0.551 | 0.932 | -0.012 | 0.894 | 0.982 | 0.225 | 0.013\* | 0.498 | -0.193 | 0.034\* | 0.547 | -0.094 | 0.304 | 0.796 | -0.005 | 0.958 | 0.997 | 0.013 | 0.889 | 0.982 | -0.140 | 0.126 | 0.697 |
| 86 | DMN | 0.098 | 0.283 | 0.777 | -0.050 | 0.583 | 0.932 | 0.189 | 0.038\* | 0.547 | -0.097 | 0.291 | 0.781 | -0.080 | 0.380 | 0.875 | -0.058 | 0.526 | 0.932 | -0.019 | 0.838 | 0.982 | -0.162 | 0.077 | 0.571 |
| 87 | DMN | 0.100 | 0.277 | 0.777 | -0.012 | 0.895 | 0.982 | 0.125 | 0.172 | 0.701 | -0.106 | 0.247 | 0.777 | -0.086 | 0.347 | 0.862 | -0.057 | 0.535 | 0.932 | 0.034 | 0.710 | 0.932 | -0.171 | 0.061 | 0.571 |
| 96 | DMN | 0.129 | 0.159 | 0.699 | 0.068 | 0.460 | 0.911 | 0.271 | 0.003\* | 0.432 | -0.013 | 0.889 | 0.982 | -0.044 | 0.630 | 0.932 | -0.096 | 0.295 | 0.784 | -0.046 | 0.620 | 0.932 | -0.223 | 0.014\* | 0.498 |
| 97 | DMN | 0.048 | 0.600 | 0.932 | 0.129 | 0.157 | 0.699 | 0.197 | 0.031\* | 0.547 | -0.076 | 0.408 | 0.894 | -0.084 | 0.362 | 0.875 | -0.127 | 0.166 | 0.699 | 0.000 | 0.997 | 0.997 | -0.088 | 0.338 | 0.849 |
| 98 | DMN | 0.058 | 0.527 | 0.932 | -0.028 | 0.760 | 0.963 | 0.129 | 0.157 | 0.699 | -0.102 | 0.264 | 0.777 | -0.075 | 0.416 | 0.894 | -0.130 | 0.154 | 0.699 | 0.035 | 0.701 | 0.932 | -0.081 | 0.375 | 0.875 |
| 99 | DMN | 0.090 | 0.326 | 0.826 | -0.014 | 0.876 | 0.982 | 0.058 | 0.525 | 0.932 | -0.205 | 0.024\* | 0.514 | -0.025 | 0.786 | 0.973 | -0.059 | 0.518 | 0.932 | 0.046 | 0.619 | 0.932 | -0.044 | 0.636 | 0.932 |
| 101 | DMN | 0.095 | 0.300 | 0.790 | 0.098 | 0.283 | 0.777 | 0.131 | 0.153 | 0.699 | -0.183 | 0.044\* | 0.554 | -0.007 | 0.936 | 0.995 | -0.121 | 0.185 | 0.740 | -0.103 | 0.259 | 0.777 | -0.110 | 0.229 | 0.777 |
| 102 | DMN | 0.039 | 0.668 | 0.932 | 0.040 | 0.666 | 0.932 | 0.099 | 0.279 | 0.777 | -0.094 | 0.307 | 0.797 | 0.020 | 0.830 | 0.982 | -0.129 | 0.157 | 0.699 | 0.036 | 0.694 | 0.932 | 0.065 | 0.476 | 0.926 |
| 104 | DMN | 0.055 | 0.550 | 0.932 | -0.150 | 0.100 | 0.655 | 0.003 | 0.970 | 0.997 | -0.108 | 0.239 | 0.777 | -0.059 | 0.523 | 0.932 | -0.146 | 0.111 | 0.657 | -0.126 | 0.168 | 0.699 | 0.036 | 0.696 | 0.932 |
| 105 | DMN | 0.040 | 0.666 | 0.932 | -0.126 | 0.168 | 0.699 | 0.167 | 0.067 | 0.571 | -0.075 | 0.415 | 0.894 | -0.005 | 0.954 | 0.995 | -0.044 | 0.628 | 0.932 | 0.054 | 0.553 | 0.932 | 0.085 | 0.354 | 0.874 |
| 108 | DMN | 0.134 | 0.143 | 0.699 | 0.019 | 0.833 | 0.982 | 0.161 | 0.077 | 0.571 | -0.046 | 0.616 | 0.932 | -0.027 | 0.767 | 0.966 | -0.193 | 0.034\* | 0.547 | 0.038 | 0.683 | 0.932 | 0.000 | 0.996 | 0.997 |
| 112 | DMN | 0.010 | 0.914 | 0.989 | 0.047 | 0.611 | 0.932 | 0.098 | 0.284 | 0.777 | -0.128 | 0.161 | 0.699 | -0.050 | 0.586 | 0.932 | 0.017 | 0.852 | 0.982 | 0.007 | 0.937 | 0.995 | -0.106 | 0.246 | 0.777 |
| 113 | DMN | -0.029 | 0.750 | 0.956 | -0.066 | 0.470 | 0.923 | 0.091 | 0.323 | 0.826 | -0.082 | 0.373 | 0.875 | 0.041 | 0.653 | 0.932 | -0.043 | 0.641 | 0.932 | 0.024 | 0.792 | 0.973 | -0.002 | 0.986 | 0.997 |
| 114 | DMN | 0.017 | 0.852 | 0.982 | 0.013 | 0.887 | 0.982 | 0.134 | 0.144 | 0.699 | -0.075 | 0.416 | 0.894 | 0.014 | 0.879 | 0.982 | -0.009 | 0.925 | 0.995 | 0.056 | 0.544 | 0.932 | -0.068 | 0.460 | 0.911 |
| 115 | DMN | 0.102 | 0.265 | 0.777 | -0.010 | 0.912 | 0.989 | 0.193 | 0.034\* | 0.547 | -0.172 | 0.060 | 0.571 | -0.046 | 0.617 | 0.932 | -0.102 | 0.264 | 0.777 | 0.047 | 0.608 | 0.932 | 0.110 | 0.231 | 0.777 |
| 119 | DMN | 0.053 | 0.567 | 0.932 | 0.080 | 0.384 | 0.878 | 0.189 | 0.038\* | 0.547 | -0.162 | 0.075 | 0.571 | -0.003 | 0.970 | 0.997 | -0.081 | 0.375 | 0.875 | -0.061 | 0.509 | 0.932 | -0.162 | 0.076 | 0.571 |
| 121 | DMN | 0.038 | 0.677 | 0.932 | -0.022 | 0.815 | 0.981 | 0.146 | 0.111 | 0.657 | -0.148 | 0.105 | 0.657 | -0.058 | 0.527 | 0.932 | -0.007 | 0.942 | 0.995 | -0.053 | 0.562 | 0.932 | -0.068 | 0.458 | 0.911 |
| 127 | DMN | 0.071 | 0.438 | 0.910 | -0.050 | 0.588 | 0.932 | 0.190 | 0.037\* | 0.547 | -0.156 | 0.087 | 0.597 | -0.075 | 0.413 | 0.894 | -0.047 | 0.607 | 0.932 | 0.164 | 0.073 | 0.571 | -0.017 | 0.856 | 0.982 |
| 128 | DMN | -0.007 | 0.939 | 0.995 | -0.006 | 0.948 | 0.995 | 0.266 | 0.003\* | 0.432 | -0.026 | 0.781 | 0.970 | -0.010 | 0.911 | 0.989 | -0.107 | 0.241 | 0.777 | 0.023 | 0.798 | 0.977 | -0.011 | 0.906 | 0.989 |
| 130 | DMN | 0.139 | 0.128 | 0.697 | 0.062 | 0.501 | 0.932 | 0.276 | 0.002\* | 0.432 | 0.014 | 0.882 | 0.982 | -0.093 | 0.308 | 0.797 | -0.111 | 0.226 | 0.777 | -0.044 | 0.628 | 0.932 | -0.207 | 0.023\* | 0.514 |
| 137 | DMN | 0.137 | 0.134 | 0.699 | -0.014 | 0.882 | 0.982 | 0.182 | 0.045\* | 0.554 | -0.194 | 0.033\* | 0.547 | -0.137 | 0.133 | 0.699 | -0.190 | 0.037\* | 0.547 | -0.034 | 0.707 | 0.932 | -0.143 | 0.118 | 0.668 |
| 139 | DMN | 0.019 | 0.834 | 0.982 | -0.010 | 0.914 | 0.989 | 0.157 | 0.086 | 0.597 | -0.098 | 0.284 | 0.777 | -0.014 | 0.877 | 0.982 | -0.101 | 0.271 | 0.777 | -0.023 | 0.803 | 0.978 | -0.061 | 0.509 | 0.932 |
| 177 | FPN | 0.043 | 0.642 | 0.932 | -0.020 | 0.825 | 0.982 | 0.064 | 0.487 | 0.932 | 0.006 | 0.948 | 0.995 | -0.022 | 0.809 | 0.979 | 0.002 | 0.985 | 0.997 | -0.078 | 0.394 | 0.886 | -0.147 | 0.107 | 0.657 |
| 178 | FPN | 0.035 | 0.703 | 0.932 | 0.068 | 0.460 | 0.911 | 0.120 | 0.192 | 0.755 | -0.082 | 0.369 | 0.875 | -0.052 | 0.573 | 0.932 | -0.062 | 0.497 | 0.932 | 0.098 | 0.286 | 0.777 | -0.016 | 0.865 | 0.982 |
| 181 | FPN | 0.100 | 0.274 | 0.777 | 0.057 | 0.536 | 0.932 | 0.205 | 0.024\* | 0.514 | 0.012 | 0.892 | 0.982 | -0.040 | 0.665 | 0.932 | 0.026 | 0.774 | 0.966 | 0.008 | 0.931 | 0.995 | -0.165 | 0.070 | 0.571 |
| 190 | FPN | 0.117 | 0.202 | 0.776 | 0.083 | 0.363 | 0.875 | 0.132 | 0.148 | 0.699 | -0.064 | 0.488 | 0.932 | -0.048 | 0.604 | 0.932 | 0.042 | 0.644 | 0.932 | 0.072 | 0.430 | 0.906 | -0.146 | 0.111 | 0.657 |
| 192 | FPN | 0.049 | 0.591 | 0.932 | 0.015 | 0.871 | 0.982 | 0.034 | 0.709 | 0.932 | 0.003 | 0.978 | 0.997 | -0.014 | 0.877 | 0.982 | 0.099 | 0.282 | 0.777 | -0.015 | 0.870 | 0.982 | -0.178 | 0.050 | 0.554 |
| 193 | FPN | 0.108 | 0.240 | 0.777 | 0.006 | 0.946 | 0.995 | 0.113 | 0.215 | 0.777 | -0.023 | 0.804 | 0.978 | -0.099 | 0.280 | 0.777 | 0.041 | 0.658 | 0.932 | 0.135 | 0.140 | 0.699 | -0.163 | 0.075 | 0.571 |
| 194 | FPN | 0.177 | 0.053 | 0.571 | 0.058 | 0.524 | 0.932 | 0.106 | 0.247 | 0.777 | 0.119 | 0.194 | 0.755 | 0.056 | 0.544 | 0.932 | 0.031 | 0.740 | 0.951 | -0.055 | 0.546 | 0.932 | -0.251 | 0.006\* | 0.475 |
| 195 | FPN | 0.058 | 0.527 | 0.932 | -0.055 | 0.548 | 0.932 | 0.062 | 0.502 | 0.932 | 0.009 | 0.926 | 0.995 | -0.080 | 0.381 | 0.875 | -0.001 | 0.993 | 0.997 | -0.035 | 0.707 | 0.932 | -0.213 | 0.019\* | 0.514 |
| 196 | FPN | -0.014 | 0.876 | 0.982 | 0.037 | 0.684 | 0.932 | 0.126 | 0.169 | 0.699 | -0.134 | 0.144 | 0.699 | -0.061 | 0.509 | 0.932 | 0.068 | 0.457 | 0.911 | 0.021 | 0.817 | 0.981 | -0.210 | 0.021\* | 0.514 |
| 197 | FPN | -0.042 | 0.646 | 0.932 | 0.053 | 0.561 | 0.932 | 0.143 | 0.118 | 0.668 | -0.042 | 0.644 | 0.932 | -0.082 | 0.372 | 0.875 | 0.109 | 0.234 | 0.777 | 0.049 | 0.593 | 0.932 | -0.185 | 0.043\* | 0.554 |
| 198 | FPN | 0.032 | 0.731 | 0.948 | 0.052 | 0.573 | 0.932 | 0.156 | 0.087 | 0.597 | 0.040 | 0.663 | 0.932 | -0.047 | 0.608 | 0.932 | -0.035 | 0.706 | 0.932 | -0.027 | 0.765 | 0.966 | -0.099 | 0.282 | 0.777 |
| 199 | FPN | 0.091 | 0.318 | 0.818 | 0.008 | 0.928 | 0.995 | 0.080 | 0.381 | 0.875 | 0.044 | 0.632 | 0.932 | -0.035 | 0.706 | 0.932 | -0.006 | 0.950 | 0.995 | 0.030 | 0.746 | 0.953 | -0.109 | 0.236 | 0.777 |
| 200 | FPN | 0.173 | 0.058 | 0.571 | 0.108 | 0.240 | 0.777 | 0.101 | 0.269 | 0.777 | 0.005 | 0.953 | 0.995 | 0.056 | 0.539 | 0.932 | 0.037 | 0.684 | 0.932 | -0.099 | 0.279 | 0.777 | -0.179 | 0.049\* | 0.554 |
| 204 | SN | 0.084 | 0.359 | 0.875 | 0.115 | 0.209 | 0.777 | 0.241 | 0.008\* | 0.475 | -0.026 | 0.775 | 0.966 | 0.027 | 0.770 | 0.966 | 0.032 | 0.729 | 0.948 | 0.063 | 0.490 | 0.932 | -0.248 | 0.006\* | 0.475 |
| 207 | SN | 0.015 | 0.872 | 0.982 | 0.073 | 0.429 | 0.906 | 0.203 | 0.025\* | 0.514 | -0.043 | 0.636 | 0.932 | -0.126 | 0.170 | 0.699 | 0.031 | 0.735 | 0.948 | -0.036 | 0.694 | 0.932 | -0.112 | 0.221 | 0.777 |
| 213 | SN | 0.042 | 0.650 | 0.932 | -0.050 | 0.589 | 0.932 | 0.026 | 0.776 | 0.966 | -0.130 | 0.156 | 0.699 | -0.073 | 0.428 | 0.906 | 0.077 | 0.402 | 0.891 | 0.042 | 0.647 | 0.932 | -0.132 | 0.148 | 0.699 |
| 214 | SN | 0.044 | 0.635 | 0.932 | 0.179 | 0.050 | 0.554 | 0.212 | 0.019\* | 0.514 | -0.146 | 0.109 | 0.657 | -0.097 | 0.288 | 0.778 | 0.002 | 0.986 | 0.997 | 0.000 | 0.996 | 0.997 | -0.163 | 0.075 | 0.571 |
| 215 | SN | 0.001 | 0.991 | 0.997 | -0.040 | 0.665 | 0.932 | 0.010 | 0.916 | 0.989 | -0.110 | 0.230 | 0.777 | -0.033 | 0.716 | 0.934 | 0.096 | 0.296 | 0.784 | -0.110 | 0.231 | 0.777 | -0.078 | 0.394 | 0.886 |
| 216 | SN | 0.030 | 0.744 | 0.953 | -0.029 | 0.753 | 0.957 | 0.056 | 0.544 | 0.932 | -0.106 | 0.246 | 0.777 | -0.044 | 0.629 | 0.932 | 0.051 | 0.578 | 0.932 | -0.112 | 0.223 | 0.777 | -0.039 | 0.670 | 0.932 |
| 218 | SN | 0.021 | 0.820 | 0.981 | 0.145 | 0.113 | 0.660 | 0.230 | 0.011\* | 0.475 | -0.071 | 0.437 | 0.910 | -0.075 | 0.414 | 0.894 | 0.002 | 0.982 | 0.997 | 0.062 | 0.498 | 0.932 | -0.181 | 0.047\* | 0.554 |
| 219 | SN | -0.002 | 0.982 | 0.997 | 0.164 | 0.073 | 0.571 | 0.159 | 0.081 | 0.583 | -0.139 | 0.129 | 0.697 | 0.037 | 0.683 | 0.932 | -0.049 | 0.592 | 0.932 | -0.057 | 0.536 | 0.932 | -0.050 | 0.584 | 0.932 |
| 220 | SN | 0.130 | 0.157 | 0.699 | 0.023 | 0.806 | 0.978 | 0.204 | 0.025\* | 0.514 | -0.119 | 0.193 | 0.755 | -0.065 | 0.476 | 0.926 | 0.015 | 0.868 | 0.982 | -0.079 | 0.388 | 0.882 | -0.136 | 0.138 | 0.699 |
| 50 | CON | 0.112 | 0.220 | 0.777 | 0.003 | 0.970 | 0.997 | 0.040 | 0.660 | 0.932 | 0.035 | 0.701 | 0.932 | 0.049 | 0.594 | 0.932 | -0.078 | 0.396 | 0.886 | -0.017 | 0.854 | 0.982 | -0.041 | 0.652 | 0.932 |
| 259 | DAN | 0.161 | 0.078 | 0.571 | 0.024 | 0.793 | 0.973 | 0.083 | 0.367 | 0.875 | -0.036 | 0.695 | 0.932 | -0.077 | 0.398 | 0.886 | -0.044 | 0.630 | 0.932 | 0.004 | 0.963 | 0.997 | -0.087 | 0.343 | 0.857 |
| 264 | DAN | 0.108 | 0.238 | 0.777 | 0.099 | 0.282 | 0.777 | -0.017 | 0.857 | 0.982 | -0.031 | 0.734 | 0.948 | 0.101 | 0.270 | 0.777 | 0.148 | 0.106 | 0.657 | 0.110 | 0.228 | 0.777 | -0.117 | 0.203 | 0.776 |
| 9 | Uncertain | 0.049 | 0.596 | 0.932 | 0.012 | 0.896 | 0.982 | 0.155 | 0.090 | 0.608 | -0.036 | 0.692 | 0.932 | -0.003 | 0.970 | 0.997 | -0.111 | 0.227 | 0.777 | -0.050 | 0.589 | 0.932 | -0.185 | 0.042\* | 0.554 |
| 11 | Uncertain | 0.174 | 0.056 | 0.571 | 0.166 | 0.069 | 0.571 | 0.171 | 0.061 | 0.571 | -0.002 | 0.985 | 0.997 | 0.021 | 0.819 | 0.981 | -0.068 | 0.456 | 0.911 | -0.108 | 0.238 | 0.777 | -0.081 | 0.378 | 0.875 |
| 84 | Uncertain | 0.143 | 0.119 | 0.668 | 0.016 | 0.861 | 0.982 | 0.221 | 0.015\* | 0.498 | -0.050 | 0.588 | 0.932 | -0.104 | 0.257 | 0.777 | -0.133 | 0.146 | 0.699 | -0.069 | 0.453 | 0.911 | -0.236 | 0.009\* | 0.475 |
| 184 | Uncertain | 0.024 | 0.793 | 0.973 | -0.072 | 0.432 | 0.906 | 0.101 | 0.269 | 0.777 | -0.166 | 0.068 | 0.571 | -0.067 | 0.462 | 0.911 | -0.016 | 0.861 | 0.982 | 0.122 | 0.181 | 0.731 | -0.069 | 0.451 | 0.911 |
| 185 | Uncertain | 0.179 | 0.050 | 0.554 | 0.164 | 0.072 | 0.571 | 0.245 | 0.007\* | 0.475 | -0.127 | 0.164 | 0.699 | 0.071 | 0.442 | 0.911 | 0.018 | 0.841 | 0.982 | -0.070 | 0.447 | 0.911 | -0.154 | 0.092 | 0.611 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); DMN, Default Mode Network; FPN, Fronto-parietal Task Control Network; SN, Salience Network; CON, Cingulo-opercular Task Control Network; DAN, Dorsal attention Network; ROI, regions of interest; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; WAIS-CR, Wechsler Adult Intelligence Scale-Chinese Revised.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S8. Correlation analysis between the detected average controllability, neurocognitive performances, and clinical characteristics in schizophrenia under ‘0-back’ load.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Network** | **WAIS-Digit Symbol** | | | **WAIS-Information** | | | **Accuracy of 0-back** | | | **Response Time of 0-back** | | | **SAPS** | | | **SANS** | | | **Illness Duration** | | | **Treatment Dosage** | | |
| **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** |
| 147 | VN | 0.149 | 0.101 | 0.369 | 0.075 | 0.412 | 0.618 | 0.061 | 0.504 | 0.695 | -0.124 | 0.173 | 0.415 | 0.026 | 0.774 | 0.844 | 0.005 | 0.957 | 0.986 | -0.083 | 0.363 | 0.581 | 0.058 | 0.521 | 0.695 |
| 161 | VN | 0.130 | 0.153 | 0.408 | 0.053 | 0.562 | 0.710 | -0.099 | 0.278 | 0.548 | -0.171 | 0.059 | 0.369 | -0.144 | 0.113 | 0.369 | 0.032 | 0.723 | 0.844 | -0.286 | 0.001\* | 0.024\* | -0.106 | 0.245 | 0.535 |
| 236 | VAN | 0.140 | 0.123 | 0.369 | 0.095 | 0.297 | 0.548 | 0.156 | 0.085 | 0.369 | -0.002 | 0.986 | 0.986 | 0.085 | 0.351 | 0.581 | 0.154 | 0.089 | 0.369 | -0.154 | 0.089 | 0.369 | -0.029 | 0.748 | 0.844 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); VN, Visual Network; VAN, Ventral Attention Network; ROI, regions of interest; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; WAIS-CR, Wechsler Adult Intelligence Scale-Chinese Revised.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S9. Correlation analysis between the detected average controllability, neurocognitive performances, and clinical characteristics in schizophrenia under ‘2-back’ load.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Network** | **WAIS-Digit Symbol** | | | **WAIS-Information** | | | **Accuracy of 2-back** | | | **Response Time of 2-back** | | | **SAPS** | | | **SANS** | | | **Illness Duration** | | | **Treatment Dosage** | | |
| **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** |
| 25 | SMN | 0.144 | 0.114 | 0.762 | -0.011 | 0.902 | 0.979 | 0.097 | 0.288 | 0.819 | -0.130 | 0.155 | 0.773 | -0.065 | 0.477 | 0.872 | -0.079 | 0.390 | 0.851 | -0.088 | 0.338 | 0.832 | -0.094 | 0.303 | 0.819 |
| 39 | SMN | -0.010 | 0.914 | 0.979 | 0.007 | 0.943 | 0.979 | -0.004 | 0.966 | 0.979 | -0.091 | 0.320 | 0.819 | 0.023 | 0.798 | 0.945 | 0.117 | 0.202 | 0.808 | -0.126 | 0.167 | 0.773 | -0.155 | 0.089 | 0.762 |
| 63 | AN | 0.111 | 0.227 | 0.819 | 0.118 | 0.198 | 0.808 | 0.164 | 0.072 | 0.762 | 0.009 | 0.921 | 0.979 | -0.079 | 0.387 | 0.851 | -0.145 | 0.114 | 0.762 | 0.057 | 0.531 | 0.918 | -0.194 | 0.033\* | 0.762 |
| 71 | AN | 0.048 | 0.603 | 0.918 | 0.069 | 0.450 | 0.872 | 0.145 | 0.112 | 0.762 | 0.047 | 0.608 | 0.918 | -0.081 | 0.379 | 0.851 | -0.046 | 0.618 | 0.918 | -0.029 | 0.750 | 0.945 | -0.126 | 0.169 | 0.773 |
| 151 | VN | 0.030 | 0.741 | 0.945 | 0.070 | 0.445 | 0.872 | 0.006 | 0.945 | 0.979 | -0.077 | 0.399 | 0.851 | -0.002 | 0.979 | 0.979 | -0.143 | 0.118 | 0.762 | -0.024 | 0.796 | 0.945 | -0.043 | 0.637 | 0.918 |
| 161 | VN | 0.036 | 0.693 | 0.944 | 0.109 | 0.235 | 0.819 | 0.094 | 0.304 | 0.819 | -0.045 | 0.623 | 0.918 | -0.005 | 0.960 | 0.979 | -0.157 | 0.085 | 0.762 | -0.040 | 0.660 | 0.918 | -0.106 | 0.248 | 0.819 |
| 136 | MRN | 0.024 | 0.793 | 0.945 | 0.143 | 0.119 | 0.762 | 0.066 | 0.473 | 0.872 | -0.026 | 0.776 | 0.945 | -0.034 | 0.712 | 0.945 | -0.050 | 0.585 | 0.918 | -0.137 | 0.134 | 0.773 | -0.053 | 0.567 | 0.918 |
| 254 | Uncertain | 0.074 | 0.420 | 0.867 | 0.020 | 0.827 | 0.945 | 0.197 | 0.031\* | 0.762 | -0.042 | 0.650 | 0.918 | -0.022 | 0.813 | 0.945 | -0.099 | 0.280 | 0.819 | 0.093 | 0.311 | 0.819 | -0.042 | 0.646 | 0.918 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); SMN, Sensory/somatomotor Network; AN, Auditory Network; VN, Visual Network; MRN, Memory Retrieval Network; ROI, regions of interest; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; WAIS-CR, Wechsler Adult Intelligence Scale-Chinese Revised.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S10. Correlation analysis between the detected modal controllability and neurocognitive performances in unaffected siblings and healthy controls under ‘0-back’ load.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Network** | **WAIS-CR Digit Symbol** | | | **WAIS-CR Information** | | | **Accuracy of 0-back** | | | **Response Time of 0-back** | | |
| **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** |
| **Unaffected Siblings** | | | | | | | | | | | | | |
| 83 | DMN | 0.237 | 0.192 | 0.512 | -0.069 | 0.706 | 0.753 | 0.107 | 0.560 | 0.753 | -0.079 | 0.669 | 0.753 |
| 102 | DMN | 0.019 | 0.916 | 0.916 | -0.404 | 0.022\* | 0.176 | 0.148 | 0.420 | 0.672 | -0.163 | 0.374 | 0.672 |
| 181 | FPN | 0.078 | 0.673 | 0.753 | -0.318 | 0.076 | 0.304 | 0.374 | 0.035\* | 0.187 | -0.081 | 0.659 | 0.753 |
| 84 | Uncertain | 0.431 | 0.014\* | 0.176 | -0.151 | 0.410 | 0.672 | 0.286 | 0.112 | 0.358 | -0.219 | 0.228 | 0.521 |
| **Healthy Controls** | | | | | | | | | | | | | |
| 83 | DMN | -0.036 | 0.747 | 0.996 | -0.287 | 0.008\* | 0.128 | -0.131 | 0.232 | 0.530 | 0.164 | 0.132 | 0.528 |
| 102 | DMN | -0.175 | 0.110 | 0.528 | -0.133 | 0.225 | 0.530 | 0.000 | 0.999 | 0.999 | 0.109 | 0.320 | 0.640 |
| 181 | FPN | -0.065 | 0.556 | 0.988 | -0.026 | 0.814 | 0.999 | -0.008 | 0.943 | 0.999 | 0.045 | 0.683 | 0.993 |
| 84 | Uncertain | -0.006 | 0.955 | 0.999 | -0.222 | 0.041\* | 0.328 | -0.053 | 0.631 | 0.993 | 0.135 | 0.217 | 0.530 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); DMN, Default Mode Network; FPN, Fronto-parietal Task Control Network; ROI, regions of interest; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; WAIS-CR, Wechsler Adult Intelligence Scale-Chinese Revised.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S11. Correlation analysis between the detected modal controllability and neurocognitive performances in unaffected siblings and healthy controls under ‘2-back’ load.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Network** | **WAIS-Digit Symbol** | | | **WAIS-Information** | | | **Accuracy of 2-back** | | | **Response Time of 2-back** | | |
| **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** |
| **Unaffected Siblings** | | | | | | | | | | | | | |
| 79 | DMN | 0.070 | 0.702 | 0.960 | 0.037 | 0.840 | 0.979 | -0.042 | 0.819 | 0.979 | -0.325 | 0.069 | 0.827 |
| 83 | DMN | 0.086 | 0.641 | 0.927 | 0.166 | 0.365 | 0.827 | 0.176 | 0.335 | 0.827 | 0.104 | 0.570 | 0.893 |
| 86 | DMN | 0.167 | 0.361 | 0.827 | -0.148 | 0.420 | 0.827 | 0.002 | 0.990 | 0.997 | -0.264 | 0.144 | 0.827 |
| 87 | DMN | 0.127 | 0.489 | 0.867 | -0.291 | 0.106 | 0.827 | 0.138 | 0.453 | 0.851 | -0.231 | 0.203 | 0.827 |
| 96 | DMN | -0.028 | 0.880 | 0.985 | -0.257 | 0.156 | 0.827 | 0.201 | 0.270 | 0.827 | -0.220 | 0.225 | 0.827 |
| 97 | DMN | -0.367 | 0.039\* | 0.827 | -0.356 | 0.046 | 0.827 | 0.402 | 0.022\* | 0.827 | -0.053 | 0.772 | 0.979 |
| 98 | DMN | 0.296 | 0.100 | 0.827 | -0.150 | 0.411 | 0.827 | 0.006 | 0.972 | 0.995 | 0.017 | 0.925 | 0.995 |
| 99 | DMN | 0.099 | 0.590 | 0.897 | -0.240 | 0.186 | 0.827 | 0.134 | 0.465 | 0.858 | -0.085 | 0.644 | 0.927 |
| 101 | DMN | -0.080 | 0.663 | 0.930 | -0.207 | 0.256 | 0.827 | 0.231 | 0.204 | 0.827 | -0.081 | 0.659 | 0.930 |
| 102 | DMN | 0.034 | 0.853 | 0.985 | -0.110 | 0.548 | 0.886 | 0.203 | 0.266 | 0.827 | 0.022 | 0.905 | 0.995 |
| 104 | DMN | 0.096 | 0.601 | 0.905 | -0.344 | 0.054 | 0.827 | 0.125 | 0.495 | 0.867 | -0.224 | 0.217 | 0.827 |
| 105 | DMN | -0.005 | 0.976 | 0.995 | -0.014 | 0.940 | 0.995 | 0.226 | 0.214 | 0.827 | 0.154 | 0.399 | 0.827 |
| 108 | DMN | 0.189 | 0.300 | 0.827 | -0.044 | 0.812 | 0.979 | 0.077 | 0.677 | 0.934 | 0.023 | 0.902 | 0.995 |
| 112 | DMN | -0.198 | 0.277 | 0.827 | -0.108 | 0.556 | 0.886 | 0.210 | 0.250 | 0.827 | -0.233 | 0.200 | 0.827 |
| 113 | DMN | -0.049 | 0.790 | 0.979 | -0.272 | 0.132 | 0.827 | 0.533 | 0.002\* | 0.432 | 0.173 | 0.344 | 0.827 |
| 114 | DMN | -0.231 | 0.203 | 0.827 | -0.269 | 0.136 | 0.827 | 0.300 | 0.096 | 0.827 | -0.015 | 0.935 | 0.995 |
| 115 | DMN | 0.111 | 0.546 | 0.886 | -0.042 | 0.819 | 0.979 | 0.182 | 0.318 | 0.827 | 0.006 | 0.974 | 0.995 |
| 119 | DMN | -0.053 | 0.772 | 0.979 | -0.173 | 0.343 | 0.827 | -0.007 | 0.970 | 0.995 | -0.050 | 0.785 | 0.979 |
| 121 | DMN | -0.055 | 0.763 | 0.979 | -0.251 | 0.166 | 0.827 | 0.240 | 0.185 | 0.827 | 0.125 | 0.496 | 0.867 |
| 127 | DMN | 0.028 | 0.877 | 0.985 | -0.292 | 0.105 | 0.827 | 0.155 | 0.397 | 0.827 | -0.064 | 0.729 | 0.961 |
| 128 | DMN | 0.259 | 0.152 | 0.827 | 0.147 | 0.421 | 0.827 | -0.050 | 0.787 | 0.979 | -0.153 | 0.402 | 0.827 |
| 130 | DMN | -0.182 | 0.320 | 0.827 | -0.184 | 0.313 | 0.827 | 0.122 | 0.507 | 0.872 | -0.156 | 0.393 | 0.827 |
| 137 | DMN | 0.402 | 0.023\* | 0.827 | 0.279 | 0.122 | 0.827 | 0.143 | 0.434 | 0.835 | -0.037 | 0.841 | 0.979 |
| 139 | DMN | 0.231 | 0.204 | 0.827 | 0.301 | 0.095 | 0.827 | 0.297 | 0.099 | 0.827 | 0.141 | 0.441 | 0.836 |
| 177 | FPN | -0.182 | 0.320 | 0.827 | -0.119 | 0.515 | 0.872 | 0.001 | 0.996 | 0.997 | -0.128 | 0.485 | 0.867 |
| 178 | FPN | -0.085 | 0.644 | 0.927 | -0.226 | 0.214 | 0.827 | 0.001 | 0.997 | 0.997 | -0.191 | 0.296 | 0.827 |
| 181 | FPN | -0.041 | 0.822 | 0.979 | 0.076 | 0.679 | 0.934 | 0.417 | 0.018\* | 0.827 | 0.117 | 0.525 | 0.872 |
| 190 | FPN | -0.037 | 0.843 | 0.979 | -0.040 | 0.830 | 0.979 | -0.085 | 0.642 | 0.927 | -0.180 | 0.323 | 0.827 |
| 192 | FPN | -0.158 | 0.389 | 0.827 | -0.218 | 0.231 | 0.827 | -0.114 | 0.533 | 0.879 | -0.175 | 0.338 | 0.827 |
| 193 | FPN | -0.148 | 0.418 | 0.827 | -0.264 | 0.144 | 0.827 | -0.029 | 0.875 | 0.985 | -0.270 | 0.135 | 0.827 |
| 194 | FPN | 0.069 | 0.708 | 0.961 | -0.180 | 0.323 | 0.827 | -0.210 | 0.248 | 0.827 | -0.378 | 0.033\* | 0.827 |
| 195 | FPN | -0.143 | 0.436 | 0.835 | -0.247 | 0.173 | 0.827 | -0.062 | 0.735 | 0.962 | -0.125 | 0.495 | 0.867 |
| 196 | FPN | -0.201 | 0.269 | 0.827 | -0.157 | 0.391 | 0.827 | -0.016 | 0.929 | 0.995 | -0.158 | 0.387 | 0.827 |
| 197 | FPN | -0.278 | 0.123 | 0.827 | -0.236 | 0.193 | 0.827 | 0.367 | 0.039\* | 0.827 | 0.042 | 0.818 | 0.979 |
| 198 | FPN | -0.009 | 0.959 | 0.995 | 0.169 | 0.356 | 0.827 | 0.164 | 0.368 | 0.827 | -0.168 | 0.357 | 0.827 |
| 199 | FPN | -0.044 | 0.810 | 0.979 | -0.108 | 0.558 | 0.886 | -0.179 | 0.326 | 0.827 | -0.153 | 0.403 | 0.827 |
| 200 | FPN | -0.024 | 0.897 | 0.995 | 0.158 | 0.388 | 0.827 | 0.370 | 0.037\* | 0.827 | 0.274 | 0.129 | 0.827 |
| 204 | SN | -0.248 | 0.171 | 0.827 | -0.117 | 0.525 | 0.872 | -0.011 | 0.952 | 0.995 | -0.230 | 0.204 | 0.827 |
| 207 | SN | -0.207 | 0.255 | 0.827 | -0.224 | 0.218 | 0.827 | -0.028 | 0.879 | 0.985 | -0.087 | 0.635 | 0.927 |
| 213 | SN | -0.161 | 0.378 | 0.827 | -0.258 | 0.155 | 0.827 | 0.029 | 0.873 | 0.985 | -0.009 | 0.963 | 0.995 |
| 214 | SN | -0.127 | 0.487 | 0.867 | 0.007 | 0.970 | 0.995 | 0.292 | 0.105 | 0.827 | 0.119 | 0.516 | 0.872 |
| 215 | SN | -0.096 | 0.603 | 0.905 | -0.216 | 0.236 | 0.827 | 0.226 | 0.213 | 0.827 | 0.135 | 0.460 | 0.857 |
| 216 | SN | -0.264 | 0.144 | 0.827 | -0.163 | 0.371 | 0.827 | -0.037 | 0.843 | 0.979 | 0.004 | 0.981 | 0.995 |
| 218 | SN | -0.067 | 0.716 | 0.961 | -0.037 | 0.842 | 0.979 | 0.163 | 0.372 | 0.827 | -0.217 | 0.232 | 0.827 |
| 219 | SN | -0.103 | 0.575 | 0.893 | -0.109 | 0.551 | 0.886 | 0.439 | 0.012\* | 0.827 | 0.081 | 0.661 | 0.930 |
| 220 | SN | -0.201 | 0.271 | 0.827 | -0.250 | 0.168 | 0.827 | 0.351 | 0.049\* | 0.827 | 0.089 | 0.629 | 0.927 |
| 50 | CON | -0.010 | 0.957 | 0.995 | -0.080 | 0.662 | 0.930 | -0.005 | 0.978 | 0.995 | 0.006 | 0.975 | 0.995 |
| 259 | DAN | -0.101 | 0.583 | 0.893 | -0.065 | 0.723 | 0.961 | -0.148 | 0.418 | 0.827 | -0.142 | 0.437 | 0.835 |
| 264 | DAN | -0.051 | 0.780 | 0.979 | -0.335 | 0.061 | 0.827 | -0.010 | 0.956 | 0.995 | -0.117 | 0.524 | 0.872 |
| 9 | Uncertain | -0.153 | 0.403 | 0.827 | 0.077 | 0.674 | 0.934 | -0.063 | 0.730 | 0.961 | 0.030 | 0.870 | 0.985 |
| 11 | Uncertain | 0.281 | 0.119 | 0.827 | 0.282 | 0.118 | 0.827 | -0.061 | 0.741 | 0.964 | 0.175 | 0.337 | 0.827 |
| 84 | Uncertain | 0.186 | 0.309 | 0.827 | 0.163 | 0.374 | 0.827 | 0.067 | 0.715 | 0.961 | -0.180 | 0.325 | 0.827 |
| 184 | Uncertain | 0.124 | 0.498 | 0.867 | -0.154 | 0.401 | 0.827 | 0.042 | 0.818 | 0.979 | -0.101 | 0.583 | 0.893 |
| 185 | Uncertain | -0.245 | 0.176 | 0.827 | -0.277 | 0.125 | 0.827 | -0.102 | 0.578 | 0.893 | -0.183 | 0.315 | 0.827 |
| **Healthy Controls** | | | | | | | | | | | | | |
| 79 | DMN | 0.120 | 0.270 | 0.861 | -0.150 | 0.168 | 0.861 | -0.145 | 0.183 | 0.861 | -0.238 | 0.027\* | 0.861 |
| 83 | DMN | -0.078 | 0.474 | 0.898 | -0.096 | 0.381 | 0.898 | -0.135 | 0.214 | 0.861 | 0.062 | 0.568 | 0.898 |
| 86 | DMN | -0.004 | 0.970 | 0.982 | -0.136 | 0.213 | 0.861 | -0.125 | 0.252 | 0.861 | -0.166 | 0.126 | 0.861 |
| 87 | DMN | 0.041 | 0.708 | 0.898 | -0.172 | 0.113 | 0.861 | -0.177 | 0.102 | 0.861 | -0.027 | 0.803 | 0.901 |
| 96 | DMN | -0.014 | 0.899 | 0.943 | -0.073 | 0.505 | 0.898 | -0.175 | 0.108 | 0.861 | -0.185 | 0.088 | 0.861 |
| 97 | DMN | 0.031 | 0.776 | 0.901 | 0.018 | 0.870 | 0.934 | 0.024 | 0.825 | 0.905 | -0.047 | 0.665 | 0.898 |
| 98 | DMN | -0.051 | 0.643 | 0.898 | -0.150 | 0.168 | 0.861 | -0.197 | 0.069 | 0.861 | -0.211 | 0.051 | 0.861 |
| 99 | DMN | -0.082 | 0.452 | 0.898 | -0.088 | 0.422 | 0.898 | -0.149 | 0.170 | 0.861 | -0.171 | 0.116 | 0.861 |
| 101 | DMN | 0.059 | 0.591 | 0.898 | -0.073 | 0.504 | 0.898 | 0.042 | 0.699 | 0.898 | -0.047 | 0.665 | 0.898 |
| 102 | DMN | -0.073 | 0.502 | 0.898 | -0.151 | 0.165 | 0.861 | 0.018 | 0.873 | 0.934 | -0.045 | 0.678 | 0.898 |
| 104 | DMN | -0.127 | 0.245 | 0.861 | -0.108 | 0.324 | 0.883 | -0.139 | 0.203 | 0.861 | -0.152 | 0.163 | 0.861 |
| 105 | DMN | -0.201 | 0.064 | 0.861 | -0.127 | 0.243 | 0.861 | -0.146 | 0.180 | 0.861 | -0.080 | 0.461 | 0.898 |
| 108 | DMN | -0.055 | 0.612 | 0.898 | 0.052 | 0.631 | 0.898 | -0.115 | 0.292 | 0.864 | -0.009 | 0.933 | 0.960 |
| 112 | DMN | -0.032 | 0.769 | 0.901 | 0.063 | 0.562 | 0.898 | -0.123 | 0.260 | 0.861 | -0.051 | 0.642 | 0.898 |
| 113 | DMN | -0.160 | 0.141 | 0.861 | -0.166 | 0.127 | 0.861 | -0.145 | 0.182 | 0.861 | -0.116 | 0.287 | 0.861 |
| 114 | DMN | -0.091 | 0.407 | 0.898 | -0.137 | 0.208 | 0.861 | -0.260 | 0.016\* | 0.861 | -0.028 | 0.800 | 0.901 |
| 115 | DMN | -0.132 | 0.226 | 0.861 | -0.231 | 0.032\* | 0.861 | -0.127 | 0.242 | 0.861 | -0.127 | 0.244 | 0.861 |
| 119 | DMN | 0.134 | 0.218 | 0.861 | 0.039 | 0.719 | 0.901 | -0.162 | 0.136 | 0.861 | -0.065 | 0.549 | 0.898 |
| 121 | DMN | -0.185 | 0.088 | 0.861 | -0.140 | 0.200 | 0.861 | -0.111 | 0.310 | 0.881 | -0.162 | 0.136 | 0.861 |
| 127 | DMN | -0.027 | 0.806 | 0.901 | -0.087 | 0.427 | 0.898 | -0.096 | 0.381 | 0.898 | -0.073 | 0.503 | 0.898 |
| 128 | DMN | -0.005 | 0.964 | 0.982 | -0.079 | 0.469 | 0.898 | -0.068 | 0.537 | 0.898 | -0.217 | 0.045\* | 0.861 |
| 130 | DMN | -0.042 | 0.703 | 0.898 | -0.100 | 0.359 | 0.898 | -0.146 | 0.179 | 0.861 | -0.150 | 0.169 | 0.861 |
| 137 | DMN | 0.126 | 0.248 | 0.861 | 0.033 | 0.764 | 0.901 | 0.056 | 0.605 | 0.898 | 0.028 | 0.797 | 0.901 |
| 139 | DMN | 0.143 | 0.188 | 0.861 | 0.080 | 0.466 | 0.898 | 0.029 | 0.794 | 0.901 | -0.162 | 0.135 | 0.861 |
| 177 | FPN | 0.104 | 0.339 | 0.893 | -0.010 | 0.929 | 0.960 | -0.162 | 0.136 | 0.861 | -0.118 | 0.280 | 0.861 |
| 178 | FPN | 0.079 | 0.469 | 0.898 | -0.051 | 0.643 | 0.898 | -0.117 | 0.284 | 0.861 | -0.059 | 0.590 | 0.898 |
| 181 | FPN | -0.032 | 0.772 | 0.901 | -0.034 | 0.753 | 0.901 | -0.119 | 0.277 | 0.861 | -0.017 | 0.878 | 0.934 |
| 190 | FPN | 0.000 | 0.998 | 0.998 | 0.035 | 0.747 | 0.901 | -0.124 | 0.253 | 0.861 | -0.061 | 0.578 | 0.898 |
| 192 | FPN | 0.064 | 0.559 | 0.898 | -0.042 | 0.704 | 0.898 | -0.123 | 0.259 | 0.861 | -0.043 | 0.695 | 0.898 |
| 193 | FPN | -0.063 | 0.564 | 0.898 | -0.025 | 0.817 | 0.901 | -0.184 | 0.090 | 0.861 | 0.015 | 0.893 | 0.943 |
| 194 | FPN | 0.043 | 0.693 | 0.898 | -0.069 | 0.527 | 0.898 | -0.108 | 0.323 | 0.883 | -0.109 | 0.318 | 0.883 |
| 195 | FPN | 0.068 | 0.533 | 0.898 | -0.076 | 0.489 | 0.898 | -0.120 | 0.273 | 0.861 | -0.071 | 0.518 | 0.898 |
| 196 | FPN | 0.048 | 0.659 | 0.898 | 0.084 | 0.440 | 0.898 | -0.026 | 0.814 | 0.901 | -0.069 | 0.528 | 0.898 |
| 197 | FPN | -0.043 | 0.695 | 0.898 | -0.044 | 0.689 | 0.898 | -0.230 | 0.033\* | 0.861 | -0.044 | 0.687 | 0.898 |
| 198 | FPN | 0.078 | 0.473 | 0.898 | 0.022 | 0.841 | 0.908 | -0.045 | 0.683 | 0.898 | -0.128 | 0.239 | 0.861 |
| 199 | FPN | 0.034 | 0.755 | 0.901 | -0.010 | 0.925 | 0.960 | -0.076 | 0.487 | 0.898 | -0.143 | 0.189 | 0.861 |
| 200 | FPN | -0.047 | 0.668 | 0.898 | 0.119 | 0.275 | 0.861 | -0.134 | 0.218 | 0.861 | -0.034 | 0.756 | 0.901 |
| 204 | SN | -0.047 | 0.670 | 0.898 | 0.048 | 0.659 | 0.898 | -0.060 | 0.585 | 0.898 | -0.049 | 0.652 | 0.898 |
| 207 | SN | -0.112 | 0.304 | 0.878 | 0.169 | 0.119 | 0.861 | -0.065 | 0.552 | 0.898 | -0.035 | 0.748 | 0.901 |
| 213 | SN | 0.106 | 0.329 | 0.883 | 0.129 | 0.238 | 0.861 | -0.147 | 0.177 | 0.861 | -0.088 | 0.419 | 0.898 |
| 214 | SN | -0.006 | 0.955 | 0.978 | -0.130 | 0.232 | 0.861 | -0.121 | 0.269 | 0.861 | -0.013 | 0.908 | 0.947 |
| 215 | SN | 0.059 | 0.589 | 0.898 | -0.041 | 0.709 | 0.898 | -0.059 | 0.590 | 0.898 | -0.042 | 0.704 | 0.898 |
| 216 | SN | -0.037 | 0.732 | 0.901 | 0.004 | 0.973 | 0.982 | -0.097 | 0.375 | 0.898 | 0.092 | 0.402 | 0.898 |
| 218 | SN | -0.049 | 0.654 | 0.898 | 0.095 | 0.386 | 0.898 | -0.044 | 0.689 | 0.898 | 0.027 | 0.808 | 0.901 |
| 219 | SN | -0.092 | 0.401 | 0.898 | -0.001 | 0.992 | 0.997 | -0.070 | 0.524 | 0.898 | 0.130 | 0.234 | 0.861 |
| 220 | SN | 0.136 | 0.213 | 0.861 | 0.059 | 0.591 | 0.898 | -0.064 | 0.556 | 0.898 | -0.081 | 0.460 | 0.898 |
| 50 | CON | 0.025 | 0.818 | 0.901 | -0.014 | 0.895 | 0.943 | -0.055 | 0.618 | 0.898 | -0.181 | 0.096 | 0.861 |
| 259 | DAN | 0.033 | 0.763 | 0.901 | 0.041 | 0.711 | 0.898 | -0.032 | 0.771 | 0.901 | -0.065 | 0.551 | 0.898 |
| 264 | DAN | -0.027 | 0.803 | 0.901 | 0.096 | 0.380 | 0.898 | -0.060 | 0.582 | 0.898 | -0.049 | 0.652 | 0.898 |
| 9 | Uncertain | -0.031 | 0.777 | 0.901 | 0.029 | 0.790 | 0.901 | -0.257 | 0.017\* | 0.861 | -0.091 | 0.406 | 0.898 |
| 11 | Uncertain | 0.091 | 0.404 | 0.898 | 0.192 | 0.077 | 0.861 | -0.130 | 0.232 | 0.861 | 0.112 | 0.305 | 0.878 |
| 84 | Uncertain | -0.023 | 0.830 | 0.905 | -0.048 | 0.662 | 0.898 | -0.167 | 0.125 | 0.861 | 0.096 | 0.381 | 0.898 |
| 184 | Uncertain | 0.120 | 0.271 | 0.861 | 0.058 | 0.598 | 0.898 | -0.091 | 0.406 | 0.898 | -0.023 | 0.835 | 0.906 |
| 185 | Uncertain | 0.096 | 0.381 | 0.898 | 0.106 | 0.331 | 0.883 | 0.066 | 0.546 | 0.898 | 0.068 | 0.534 | 0.898 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); DMN, Default Mode Network; FPN, Fronto-parietal Task Control Network; SN, Salience Network; CON, Cingulo-opercular Task Control Network; DAN, Dorsal attention Network; ROI, regions of interest; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; WAIS-CR, Wechsler Adult Intelligence Scale-Chinese Revised.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S12. Correlation analysis between the detected average controllability and neurocognitive performances in unaffected siblings and healthy controls under ‘0-back’ load.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Network** | **WAIS-Digit Symbol** | | | **WAIS-Information** | | | **Accuracy of 0-back** | | | **Response Time of 0-back** | | |
| **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** |
| **Unaffected Siblings** | | | | | | | | | | | | | |
| 147 | VN | 0.102 | 0.579 | 0.772 | -0.218 | 0.231 | 0.462 | 0.023 | 0.900 | 0.900 | -0.073 | 0.692 | 0.830 |
| 161 | VN | 0.232 | 0.202 | 0.462 | -0.135 | 0.460 | 0.690 | 0.313 | 0.082 | 0.462 | -0.235 | 0.196 | 0.462 |
| 236 | VAN | -0.245 | 0.176 | 0.462 | -0.355 | 0.046\* | 0.462 | -0.039 | 0.833 | 0.900 | 0.154 | 0.401 | 0.687 |
| **Healthy Controls** | | | | | | | | | | | | | |
| 147 | VN | 0.026 | 0.815 | 0.907 | -0.071 | 0.517 | 0.857 | -0.068 | 0.537 | 0.857 | -0.100 | 0.361 | 0.857 |
| 161 | VN | -0.133 | 0.224 | 0.857 | 0.070 | 0.524 | 0.857 | -0.062 | 0.571 | 0.857 | 0.143 | 0.192 | 0.857 |
| 236 | VAN | 0.009 | 0.934 | 0.934 | 0.024 | 0.831 | 0.907 | -0.162 | 0.138 | 0.857 | 0.043 | 0.695 | 0.907 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); VN, Visual Network; VAN, Ventral Attention Network; ROI, regions of interest; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; WAIS-CR, Wechsler Adult Intelligence Scale-Chinese Revised.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S13. Correlation analysis between the detected average controllability and neurocognitive performances in unaffected siblings and healthy controls under ‘2-back’ load.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROI No.** | **Network** | **WAIS-Digit Symbol** | | | **WAIS-Information** | | | **Accuracy of 2-back** | | | **Response Time of 2-back** | | |
| **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** | **r** | **p** | **p-FDR** |
| **Unaffected Siblings** | | | | | | | | | | | | | |
| 25 | SMN | -0.008 | 0.964 | 0.995 | 0.048 | 0.795 | 0.995 | -0.030 | 0.871 | 0.995 | -0.157 | 0.390 | 0.866 |
| 39 | SMN | 0.303 | 0.092 | 0.784 | 0.112 | 0.541 | 0.954 | -0.097 | 0.596 | 0.954 | 0.022 | 0.905 | 0.995 |
| 63 | AN | 0.235 | 0.196 | 0.784 | 0.235 | 0.196 | 0.784 | -0.190 | 0.297 | 0.864 | -0.150 | 0.413 | 0.866 |
| 71 | AN | -0.148 | 0.420 | 0.866 | -0.046 | 0.803 | 0.995 | -0.135 | 0.460 | 0.866 | -0.192 | 0.293 | 0.864 |
| 151 | VN | -0.412 | 0.019\* | 0.608 | -0.289 | 0.109 | 0.784 | 0.299 | 0.097 | 0.784 | 0.001 | 0.997 | 0.997 |
| 161 | VN | -0.089 | 0.626 | 0.954 | -0.262 | 0.147 | 0.784 | 0.248 | 0.172 | 0.784 | -0.021 | 0.909 | 0.995 |
| 136 | MRN | 0.024 | 0.895 | 0.995 | 0.027 | 0.883 | 0.995 | 0.012 | 0.949 | 0.995 | 0.025 | 0.891 | 0.995 |
| 254 | Uncertain | -0.193 | 0.290 | 0.864 | -0.141 | 0.442 | 0.866 | -0.137 | 0.455 | 0.866 | -0.092 | 0.618 | 0.954 |
| **Healthy Controls** | | | | | | | | | | | | | |
| 25 | SMN | -0.022 | 0.844 | 0.881 | -0.207 | 0.056 | 0.299 | 0.032 | 0.770 | 0.881 | -0.227 | 0.036\* | 0.262 |
| 39 | SMN | 0.027 | 0.809 | 0.881 | 0.036 | 0.745 | 0.881 | 0.227 | 0.035\* | 0.262 | -0.002 | 0.985 | 0.985 |
| 63 | AN | 0.126 | 0.250 | 0.615 | -0.095 | 0.385 | 0.770 | 0.023 | 0.833 | 0.881 | -0.113 | 0.302 | 0.644 |
| 71 | AN | 0.127 | 0.245 | 0.615 | -0.071 | 0.513 | 0.864 | 0.085 | 0.437 | 0.823 | -0.132 | 0.226 | 0.615 |
| 151 | VN | -0.039 | 0.718 | 0.881 | -0.116 | 0.286 | 0.644 | -0.170 | 0.118 | 0.539 | -0.129 | 0.237 | 0.615 |
| 161 | VN | 0.045 | 0.682 | 0.881 | -0.040 | 0.712 | 0.881 | -0.221 | 0.041\* | 0.262 | -0.028 | 0.800 | 0.881 |
| 136 | MRN | 0.055 | 0.618 | 0.881 | -0.040 | 0.717 | 0.881 | -0.142 | 0.193 | 0.615 | -0.225 | 0.038\* | 0.262 |
| 254 | Uncertain | -0.136 | 0.212 | 0.615 | -0.078 | 0.476 | 0.846 | -0.221 | 0.041\* | 0.262 | -0.020 | 0.853 | 0.881 |

Note. ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); SMN, Sensory/somatomotor Network; AN, Auditory Network; VN, Visual Network; MRN, Memory Retrieval Network; ROI, regions of interest; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; WAIS-CR, Wechsler Adult Intelligence Scale-Chinese Revised.

Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9).

### Table S14. Details of gene annotation analysis.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gene Annotation (Official Gene Symbol, homo sapiens) (after FDR correction, *p*<0.05) (number of gene = 36)** | | | | | |
| A26C1B | AACS | ADCY1 | ANKRD24 | ANKRD62 | AP000751.3 |
| ATXN7L3 | ATXN7L3B | C9orf129 | CAMK2G | DDHD2 | DZIP1 |
| EFNA5 | EIF4E1B | FAM83D | FMN2 | GUCA1B | KCNH1 |
| KCNMA1 | KRTAP5-6 | LCE3C | LOC100133150 | LOC100290023 | LRRC4 |
| MIAT | MKL1 | NOS2 | PXDNL | RGS4 | RP5-1027G4.3 |
| RSPO2 | SNAP25 | STEAP2 | VILL | ZFAT | ZNF365 |

Note. FDR, false discovery rate. All gene names are presented in Official Gene Symbol.

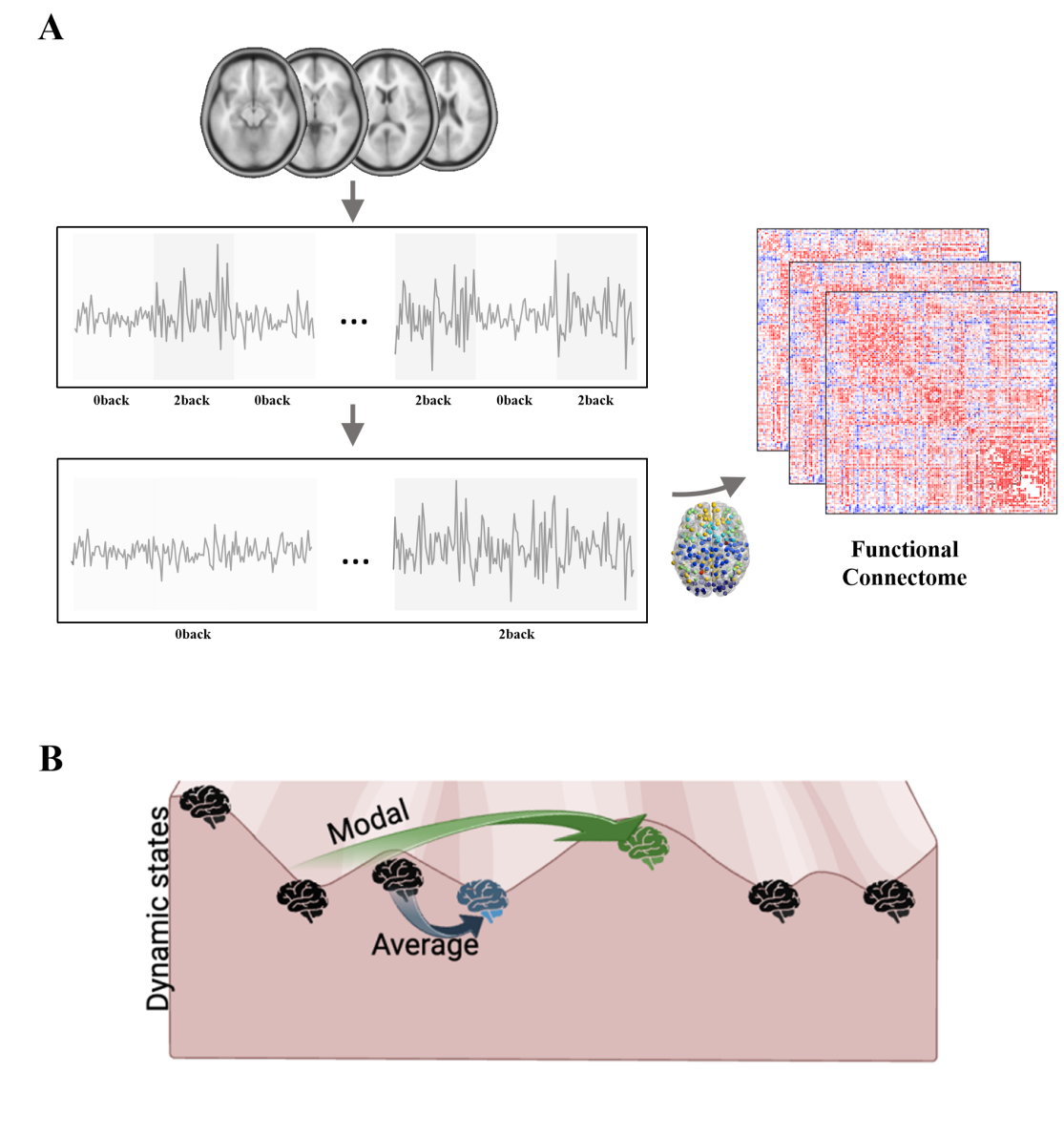
### Table S15. Details of gene enrichment analysis. Note. CC, cellular component; MF, molecular function; BP, biological process; KEGG, Kyoto Encyclopedia of Genes and Genomes. FDR-p<0.05.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Category** | **Term** | **Count** | **%** | **Genes** | **Fold Enrichment** | ***p*** | **FDR-*p*** |
| KEGG | Insulin secretion | 4 | 13.33 | SNAP25, KCNMA1, ADCY1, CAMK2G | 33.574 | <0.001 | 0.014\* |
| MF | Calmodulin binding | 5 | 16.67 | RGS4, NOS2, ADCY1, CAMK2G, KCNH1 | 16.893 | <0.001 | 0.012\* |
| BP | Regulation of neuron projection development | 3 | 10 | SNAP25, CAMK2G, ZNF365 | 60.050 | 0.001 | 0.231 |
| MF | Voltage-gated potassium channel activity | 3 | 10 | SNAP25, KCNMA1, KCNH1 | 36.174 | 0.003 | 0.101 |
| CC | Voltage-gated potassium channel complex | 3 | 10 | SNAP25, KCNMA1, KCNH1 | 27.216 | 0.005 | 0.318 |
| CC | Postsynaptic density membrane | 3 | 10 | LRRC4, ADCY1, KCNH1 | 24.665 | 0.006 | 0.318 |
| KEGG | HIF-1 signaling pathway | 3 | 10 | NOS2, EIF4E1B, CAMK2G | 19.867 | 0.008 | 0.373 |
| MF | Metal ion binding | 10 | 33.33 | NOS2, ZFAT, KCNMA1, DDHD2, PXDNL, ADCY1, DZIP1, STEAP2, ATXN7L3, ZNF365 | 2.534 | 0.009 | 0.208 |
| BP | Potassium ion transmembrane transport | 3 | 10 | SNAP25, KCNMA1, KCNH1 | 16.458 | 0.013 | 1.000 |
| CC | Plasma membrane | 13 | 43.33 | SNAP25, NOS2, ANKRD24, GUCA1B, LRRC4, PXDNL, FMN2, ADCY1, EFNA5, RGS4, KCNMA1, STEAP2, KCNH1 | 1.902 | 0.016 | 0.563 |
| BP | Cellular response to forskolin | 2 | 6.67 | ADCY1, EFNA5 | 105.802 | 0.018 | 1.000 |
| KEGG | Axon guidance | 3 | 10 | LRRC4, EFNA5, CAMK2G | 11.898 | 0.021 | 0.661 |
| BP | Regulation of calcium ion transport | 2 | 6.67 | RGS4, CAMK2G | 64.401 | 0.029 | 1.000 |
| BP | Synaptic membrane adhesion | 2 | 6.67 | LRRC4, EFNA5 | 56.970 | 0.033 | 1.000 |
| KEGG | Calcium signaling pathway | 3 | 10 | NOS2, ADCY1, CAMK2G | 8.559 | 0.039 | 0.670 |
| CC | Actin cytoskeleton | 3 | 10 | SNAP25, VILL, FMN2 | 9.072 | 0.040 | 1.000 |
| BP | Long-term memory | 2 | 6.67 | SNAP25, ADCY1 | 37.980 | 0.049 | 1.000 |
| BP | Response to hormone | 2 | 6.67 | NOS2, STEAP2 | 37.031 | 0.051 | 1.000 |
| BP | Regulation of insulin secretion | 2 | 6.67 | SNAP25, NOS2 | 34.447 | 0.054 | 1.000 |
| CC | Cytoplasm | 12 | 40 | RGS4, SNAP25, NOS2, EIF4E1B, ATXN7L3B, VILL, FMN2, ADCY1, DZIP1, FAM83D, CAMK2G, ZNF365 | 1.680 | 0.056 | 1.000 |
| BP | Negative regulation of protein catabolic process | 2 | 6.67 | NOS2, FMN2 | 32.916 | 0.057 | 1.000 |
| BP | Positive regulation of insulin secretion | 2 | 6.67 | SNAP25, AACS | 25.1056 | 0.074 | 1.000 |
| MF | Actin binding | 3 | 10 | ANKRD24, KCNMA1, FMN2 | 6.1709 | 0.079 | 1.000 |
| KEGG | Long-term potentiation | 2 | 6.67 | ADCY1, CAMK2G | 21.547 | 0.082 | 0.670 |
| CC | Photoreceptor inner segment | 2 | 6.67 | SNAP25, GUCA1B | 22.551 | 0.082 | 1.000 |
| BP | Circadian rhythm | 2 | 6.67 | NOS2, ADCY1 | 21.783 | 0.085 | 1.000 |
| CC | Caveola | 2 | 6.67 | KCNMA1, EFNA5 | 21.047 | 0.088 | 1.000 |
| CC | Glutamatergic synapse | 3 | 10 | SNAP25, LRRC4, ADCY1 | 5.706 | 0.090 | 1.000 |
| KEGG | Gastric acid secretion | 2 | 6.67 | ADCY1, CAMK2G | 18.996 | 0.092 | 0.670 |
| BP | Potassium ion transport | 2 | 6.67 | KCNMA1, KCNH1 | 19.750 | 0.093 | 1.000 |
| BP | Regulation of membrane potential | 2 | 6.67 | KCNMA1, KCNH1 | 19.237 | 0.095 | 1.000 |

Note. KEGG, Kyoto Encyclopedia of Genes and Genomes; MF, molecular function; BP, biological process; CC, cellular component; FDR, false discovery rate. All gene names are presented in Official Gene Symbol.



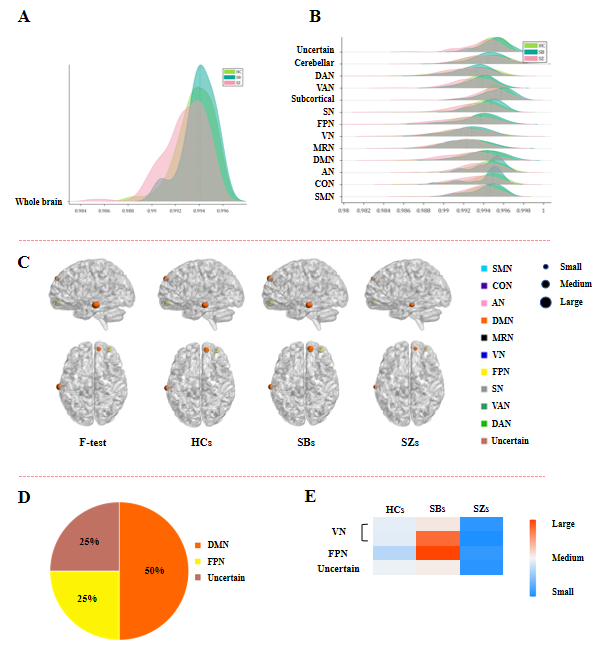
### Figure S1. The paradigm of n-back task.



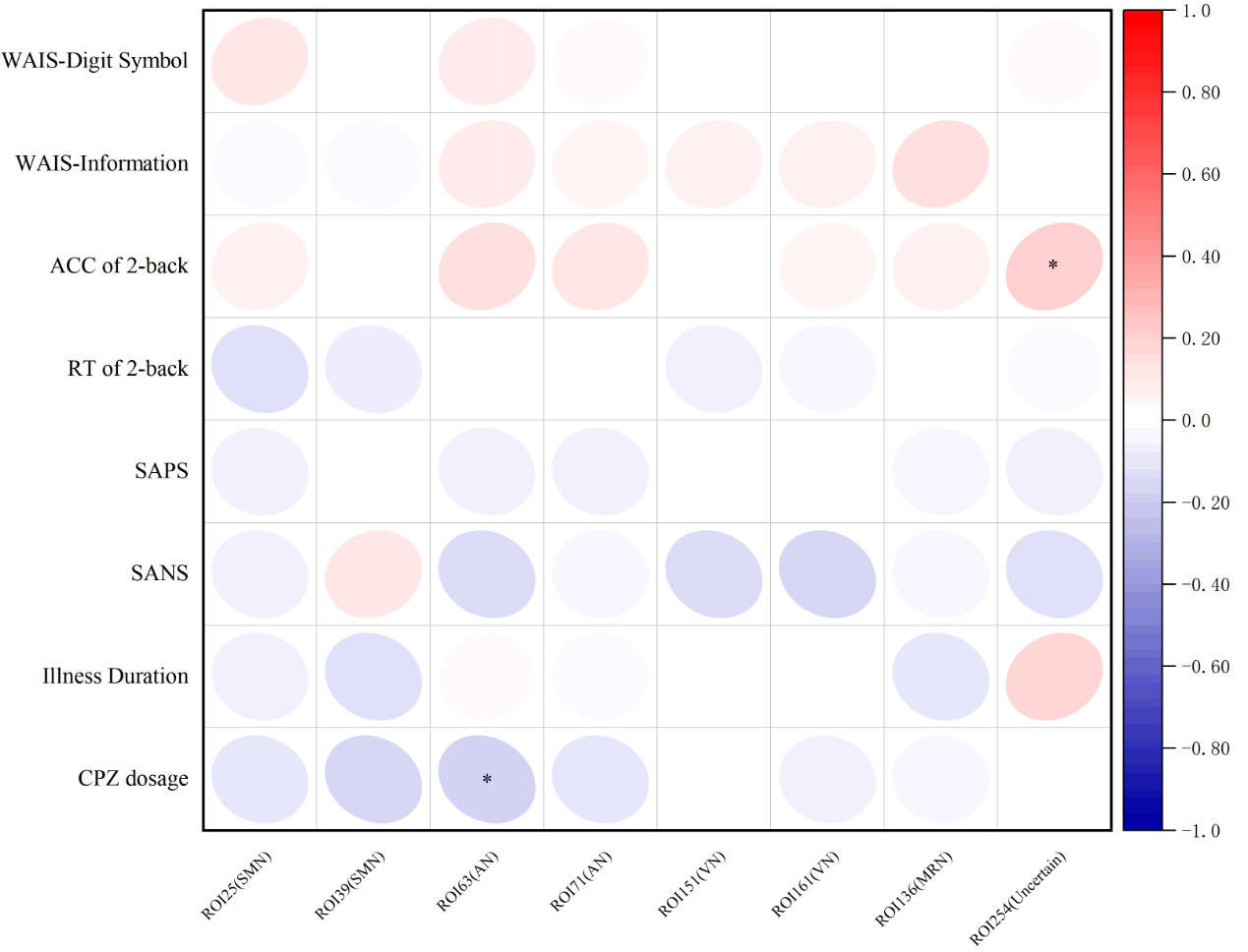
**Figure S2. Conceptual schematic of average controllability and modal controllability.** (A)Functional connectomes were constructed based on the BOLD signal under WM task, and then average and modal controllability were calculated; (B)Controllability represents the ease of switching between different dynamic brain states. Average controllability measures a regional capability to support nearby state transitions. Modal controllability measures a regional capability to support distant state transitions. This figure is inspired by the work of Sun, 2023(10) and panel B is conducted on biorender.com.



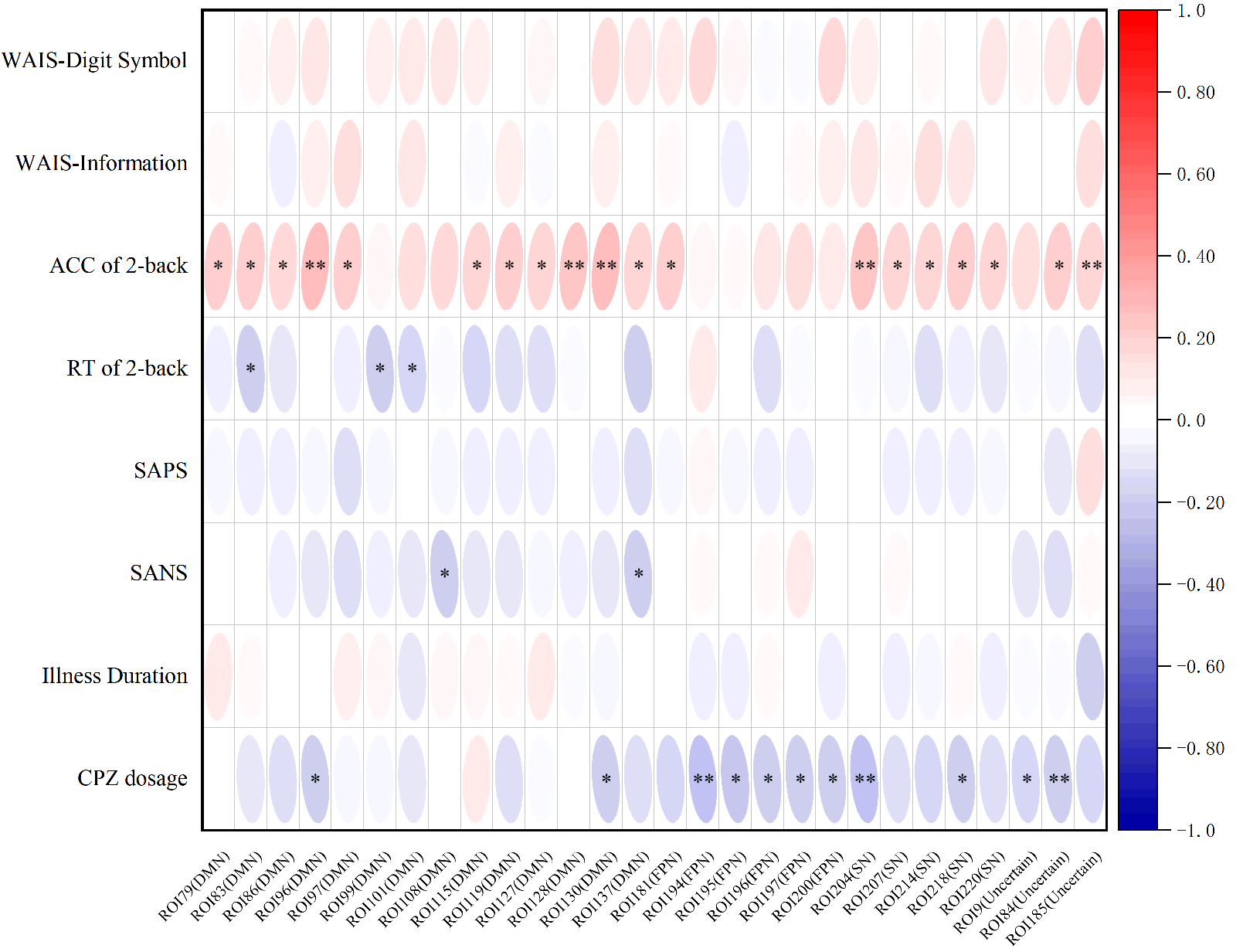
**Figure S3.** **The distribution of areas that showed omnibus differences of average controllability across all groups under ‘0-back’ load.** (A) the distribution of whole-brain average controllability; (B) the distribution of each large-scale brain network average controllability; (C) brain regions showed significantly different average controllability across all groups; (D) the proportion of detected nodes in each large-scale network; (E) the average controllability of each node across all groups. Note. SMN, Sensory/somatomotor Network; CON, Cingulo-opercular Network; AN, Auditory Network; DMN, Default Mode Network; MRN, Memory Retrieval Network; VN, Visual Network; FPN, Fronto-parietal Network; SN, Salience Network; VAN, Ventral Attention Network; DAN, Dorsal Attention Network; HC, healthy control; SB, unaffected siblings; SZ, patients with schizophrenia.



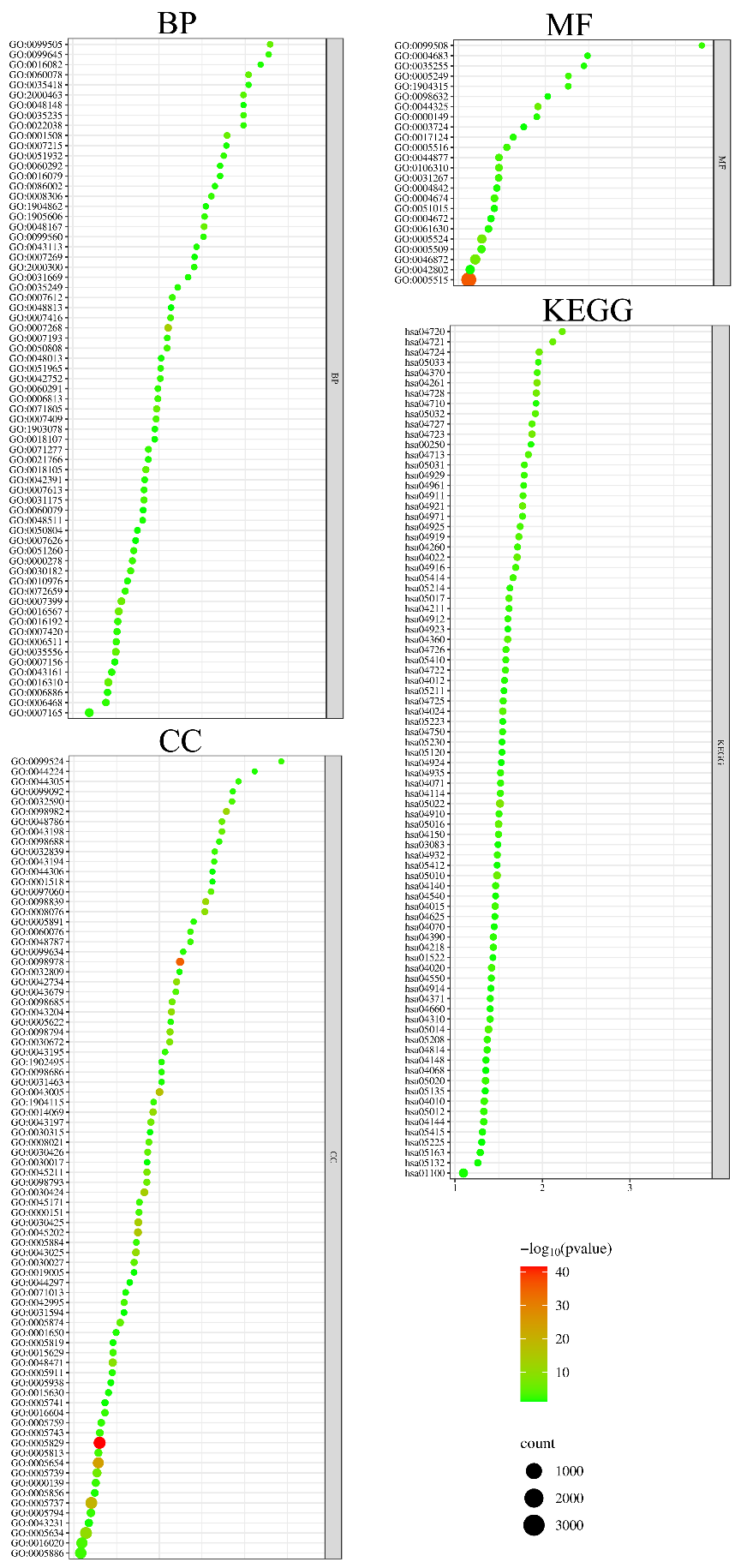
### Figure S4. The distribution of areas that showed omnibus differences of modal controllability across all groups under ‘0-back’ load. (A) the distribution of whole-brain modal controllability; (B) the distribution of each large-scale brain network modal controllability; (C) brain regions showed significantly different modal controllability across all groups; (D) the proportion of detected nodes in each large-scale network; (E) the modal controllability of each node across all groups. Note. SMN, Sensory/somatomotor Network; CON, Cingulo-opercular Task Control Network; AN, Auditory Network; DMN, Default Mode Network; MRN, Memory Retrieval Network; VN, Visual Network; FPN, Fronto-parietal Task Control Network; SN, Salience Network; VAN, Ventral Attention Network; DAN, Dorsal Attention Network; HC, healthy control; SB, unaffected siblings; SZ, patients with schizophrenia.



### Figure S5. Results of correlation analysis in average controllability among SZs under ‘2-back’ load. Note. WAIS, Wechsler Adult Intelligence Scale; ACC, Accuracy; RT, Response time; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; CPZ, chlorpromazine; ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); SMN, Sensory/somatomotor Network; AN, Auditory Network; VN, Visual Network; MRN, Memory Retrieval Network; ROI, regions of interest; Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9). \*, p<0.05, \*\*, p<0.01.



### Figure S6. Results of correlation analysis in modal controllability among SZs under ‘2-back’ load. Note. WAIS, Wechsler Adult Intelligence Scale; ACC, Accuracy; RT, Response time; SAPS, Scale for Assessment of Positive Symptoms; SANS, Scale for Assessment of Negative Symptoms; CPZ, chlorpromazine; ‘ROI No.’ refers to the index number of the node in the Power Atlas(8); DMN, Default Mode Network; FPN, Fronto-parietal Task Control Network; SN, Salience Network; ROI, regions of interest; Antipsychotic dosage refers to dose equivalents for chlorpromazine calculated using the classical mean dose method(9). \*, p<0.05, \*\*, p<0.01.



### Figure S7. Results of genetic enrichment analysis based of results in controllability during ‘2-back’ load. Note. MF, molecular function; CC, cellular component; BP, biological process; KEGG, Kyoto Encyclopedia of Genes and Genomes. FDR-p<0.05.

### References

1. Li Q, Yao L, You W, Liu J, Deng S, Li B, et al. (2023): Controllability of Functional Brain Networks and Its Clinical Significance in First-Episode Schizophrenia. *Schizophr Bull*. 49:659-668.

2. Scheid BH, Ashourvan A, Stiso J, Davis KA, Mikhail F, Pasqualetti F, et al. (2021): Time-evolving controllability of effective connectivity networks during seizure progression. *Proceedings of the National Academy of Sciences of the United States of America*. 118.

3. Gu S, Pasqualetti F, Cieslak M, Telesford QK, Yu AB, Kahn AE, et al. (2015): Controllability of structural brain networks. *Nat Commun*. 6:8414.

4. Deng S, Li J, Thomas Yeo BT, Gu S (2022): Control theory illustrates the energy efficiency in the dynamic reconfiguration of functional connectivity. *Communications biology*. 5:295.

5. Li A, Wang L, Schweitzer F (2018): *The optimal trajectory to control complex networks*.

6. Dickman DK, Davis GW (2009): The schizophrenia susceptibility gene dysbindin controls synaptic homeostasis. *Science (New York, NY)*. 326:1127-1130.

7. Ben-Shachar D, Laifenfeld D (2004): Mitochondria, synaptic plasticity, and schizophrenia. *Int Rev Neurobiol*. 59:273-296.

8. Power JD, Cohen AL, Nelson SM, Wig GS, Barnes KA, Church JA, et al. (2011): Functional network organization of the human brain. *Neuron*. 72:665-678.

9. Leucht S, Samara M, Heres S, Patel MX, Furukawa T, Cipriani A, et al. (2015): Dose Equivalents for Second-Generation Antipsychotic Drugs: The Classical Mean Dose Method. *Schizophr Bull*. 41:1397-1402.

10. Sun H, Jiang R, Dai W, Dufford AJ, Noble S, Spann MN, et al. (2023): Network controllability of structural connectomes in the neonatal brain. *Nature Communications*. 14:5820.