**Supplementary material**

Disrupted thalamo-cortical connectivity as an endophenotype of the schizophrenia: Diffusion tractography study in the unaffected relatives

1. **Head motion**

Although the head motion was corrected in the preprocessing stage, we carried out an additional investigation on the head motion. The absolute values of the frame wise translation and rotation were estimated and summed for every subject, resulting in the frame-wise displacement (FD) value. The FD was compared between groups using student’s t test. This test revealed significant difference in the FD values, as shown on the Table 1.

To take this head motion effect out from the statistical comparison of the FA, we added extra covariate of the FD values along with age and sex to the analysis of covariance (ANCOVA). The ANCOVA result still showed significant effect of group on the left thalamo-orbitofrontal FA, *F* (1, 64) = 7.23, *P* = 0.009, but not in the right thalamo-orbitofrontal FA, *F* (1, 64) = 1.83, *P* = 0.18, which is the same as the ANCOVA without the motion covariate. It confirms that the significant group effect on the FA exists without the effect of head motions.

1. **Individual region of interest (ROI) size**

To take the effect of individual thalamus and orbitofrontal ROI size out from the statistical comparison, we carried out ANCOVA to see the group effect on the FA with the sex, age and ROI size as the covariate. ROI size has been estimated as the sum of the thalamus ROI and the orbitofrontal ROI. The ANCOVA result still showed significant effect of group on the left thalamo-orbitofrontal FA, *F* (1, 64) = 6.87, *P* = 0.01, but not in the right thalamo-orbitofrontal FA, *F* (1, 64) = 1.82, *P* = 0.18, which is the same as the ANCOVA without the ROI size covariate. It shows the significant group effect on the FA is independent from the size of the seed and target ROI.

1. **Intracranial volume**

To take the effect of individual intracranial volume out from the statistical comparison, we carried out ANCOVA to see the group effect on the FA with the sex, age and intracranial volume. And it did not change the result in the left thalamo-OFC tract, F (1, 64) = 7.22, P = .00917.

**Table 1. Head motion information for each group and the statistical comparison.**

|  |  |  |  |
| --- | --- | --- | --- |
| GHR FD | HCs FD | *T* | *P* |
| 0.26 ± 0.17 | 1.15 ± 0.40 | -12.2 | < 0.001 |

GHR, genetic high risk; HCs, healthy controls