**Supplementary Table 1:** Motor assessment scorings in FEP patients and healthy controls (One-way Anova)

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|  |  **Patients**  | **Controls** | **Differences** |  |  |  |  |
| **Variables (x ± SD)** |  |  | **F-value**  | **p-value** | **Post hoc** |  |  |  |
| UKU Total score | 1.92 ± 2.09 | 0.09 ± 0.42 | 17.15 | <.001 | **P>C** |  |  |  |
|  UKU Dystonia | 0.13 ± 0.44 | 0.00 ± 0.00 | 1.81 | .183 |  |  |  |  |
|  UKU Rigidity | 0.48 ± 0.71 | 0.04 ± 0.21 | 8.17 | .006 | **P>C** |  |  |  |
|  UKU Hypokinesia | 0.65 ± 0.76 | 0.00 ± 0.00 | 16.59 | <.001 | **P>C** |  |  |  |
|  UKU Dyskinesia | 0.06 ± 0.32 | 0.00 ± 0.00 | 0.87 | .354 |  |  |  |  |
|  UKU Tremor | 0.27 ± 0.49 | 0.09 ± 0.29 | 2.73 | .103 |  |  |  |  |
|  UKU Akathisia | 0.38 ± 0.67 | 0.00 ± 0.00 | 7.10 | .010 | **P>C** |  |  |  |
| BFCRS total | 2.27 ± 3.97 | 0.13 ± 0.63 | 6.57 | .013 | **P>C P>C** |  |  |  |
| NES total | 13.79 ± 6.23 | 5.61 ± 4.51 | 31.60 | <.001 | **P>C** |  |  |  |
|  NES integration | 2.56 ± 1.80 | 1.39 ± 1.37 | 7.61 | .007 | **P>C** |  |  |  |
|  NES coordination  | 2.04 ± 2.28 | 0.35 ± 0.89 | 11.79 | .001 | **P>C** |  |  |  |
|  NES sequencing | 2.88 ± 2.17 | 1.04 ± 1.22 | 14.16 | <.001 | **P>C** |  |  |  |
|  NES other | 6.31 ± 3.54 | 2.83± 2.59 | 17.73 | <.001 | **P>C** |  |  |  |
|  |  |  |  |  |  |  |

SD: standard deviation. CASH: Comprehensive Assessment Symptom History. Dx: diagnosis. CPZ\_day: daily mean chlorpromazine equivalent dose.

CPZ\_Total exposure: Total chlorpromazine equivalent dose; n.s.= non-significant

a= Schizophrenia spectrum disorder included schizophrenia, schizophreniform and schizoaffective disorders

P= Patients. S= Siblings. C= Controls. UKU: \*\*. BFCRS: Bush-Francis Catatonia Rating Scale. NES: Neurological Evaluation Scale

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| **Supplementary Table 2.** Descriptive data and significant differences in MRI neuroimaging measures of FEP patients and healthy controls (repeated measures MANOVA) |
|  | **Fractional anisotropy (FA)1** | **Mean Diffusivity (MD)** 2 |  **Relaxometry (R2\*)** 3 |
| **Patient** | **Control** | **Patient** | **Control** | **Patient** | **Control** |
| **Left Caudate** | 0.17 ± 0.01 | 0.29 ± 0.27 | 0.96 ± 0.07 | 0.90 ± 0.18  | 26.24 ±3.83 | 24.99 ± 2.45 |
| **Right Caudate** | 0.18 ± 0.02 | 0.29 ± 0.25 | 0.87 ± 0.05 | 0.86 ± 0.17 | 16.76 ± 1.61 | 16.22 ± 1.35 |
| **Left Putamen** | 0.22 ± 0.02 | 0.30 ± 0.17 | 0.75 ± 0.01 | 0.73 ± 0.12 | 25.15 ± 4.61 | 23.97 ± 2.36 |
| **Right Putamen** | 0.21 ± 0.01 | 0.30 ± 0.18 | 0.75 ± 0.01 | 0.73 ± 0.12 | 32.46 ± 6.66 | 31.05 ± 3.68 |
| **Left Globus Pallidus** | 0.30 ± 0.04 | 0.35 ± 0.14 | 0.75 ± 0.03 | 0.74 ± 0.12 | 41.75 ± 5.97 | 41.69 ± 3.84 |
| **Right Globus Pallidus** | 0.34 ± 0.03 | 0.39 ± 0.12 | 0.74 ± 0.02 | 0.73 ± 0.1 | 55.45 ± 6.34 | 55.26 ± 6.48 |
| **Left Accumbens** | 0.20 ± 0.03 | 0.30 ± 0.21 | 0.82 ± 0.04 | 0.79 ± 0.14 | 17.50 ± 4.73 | 17.15 ± 2.84 |
| **Right Accumbens** | 0.20 ± 0.03 | 0.30 ± 0.20 | 0.78 ± 0.02 | 0.77 ± 0.12 | 36.93 ± 6.29 | 35.30 ± 3.99 |

1: FEP patients showed significantly lower in all FA measures than healthy controls (p≤0.05).

2: No significant differences between groups on MD measures were found

3: There were no significant differences between FEP patients and healthy controls in R2\* measures