

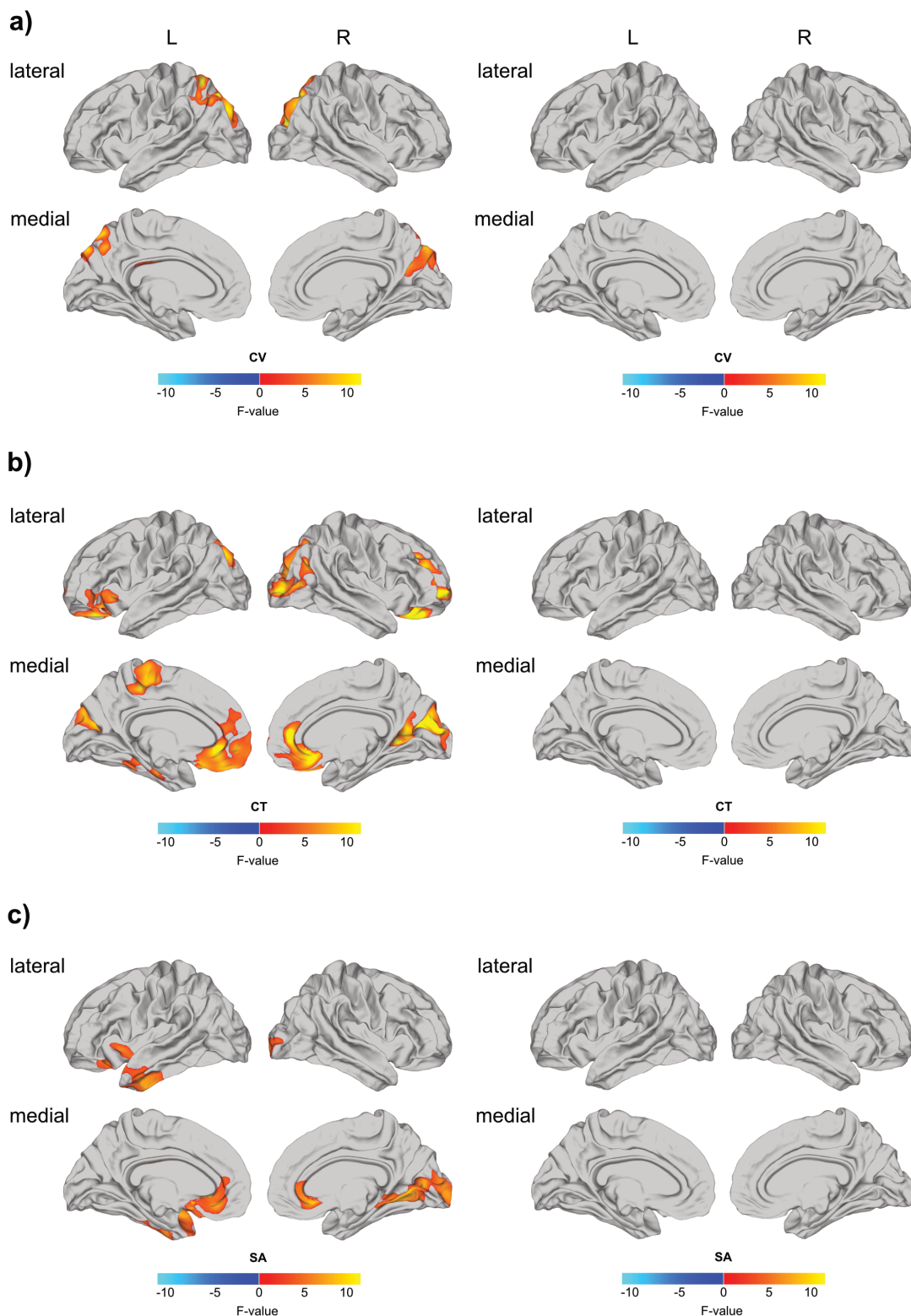
Supplementary Materials

Title: Brain Morphometry in 22q11.2 Deletion Syndrome: An exploration of differences in cortical thickness, surface area, and their contribution to cortical volume.

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S1 – Nested model comparison of Age effects



Nested model comparisons for (a) cortical volume (CV), (b) cortical thickness (CT), and (c) surface area (SA). The right panel shows the comparison of the linear vs. quadratic model, and the left panel shows the quadratic model vs. cubic model, including all age effects and age-by-group interactions. *F*-values (blue to red) indicate voxels where the more complex model provided a better fit than the more reduced model (*F*-statistic, thresholded). Model comparisons are indicated by random-field theory (RFT)-based, cluster-corrected ($p < 0.05$) difference maps in goodness of fit (based on *F*-statistics).

S2 – Cortical Thickness clusters of significant differences in 22q11.2DS compared to controls

| Contrast | Cluster | Region Labels | Hemisphere | BA | Vertices | Talairach | | | t_{max} | $p_{cluster}$ |
|----------------|---------|--|------------|---------------------|----------|-----------|-----|-----|-----------|----------------------|
| | | | | | | x | y | z | | |
| CT | | | | | | | | | | |
| Case > Control | | | | | | | | | | |
| | 1 | Caudal middle frontal gyrus, lateral orbital frontal cortex, medial orbitofrontal cortex, pars orbitalis, pars triangularis, precentral gyrus, rostral anterior cingulate cortex, rostral middle frontal gyrus, superior frontal gyrus | R | 8-11, 24, 32, 46-47 | 14612 | 10 | 25 | -16 | 4.40 | 1.1×10^{-5} |
| | 2 | Lateral orbital frontal cortex, medial orbitofrontal cortex, rostral anterior cingulate gyrus, superior frontal gyrus | L | 8-11, 24, 32, 43-47 | 8442 | -7 | 33 | -6 | 4.46 | 1.1×10^{-5} |
| | 3 | Postcentral gyrus, precentral gyrus, supramarginal gyrus | R | 1-4, 40 | 6063 | 42 | -12 | 29 | 4.43 | 1.8×10^{-5} |
| | 4 | Cuneus cortex, lateral occipital cortex, lingual gyrus & pericalcarine cortex | R | 17-19 | 4676 | 6 | -72 | 6 | 4.34 | 2.0×10^{-5} |
| | 5 | Rostral middle frontal gyrus, superior frontal gyrus | L | 4, 6, 8-9 | 3959 | -22 | 39 | 20 | 3.72 | 2.4×10^{-5} |
| | 6 | Cuneus cortex, lateral occipital cortex, lingual gyrus & pericalcarine cortex | L | 17 - 19 | 4433 | -5 | -81 | 3 | 4.52 | 3.5×10^{-5} |
| | 7 | Isthmus-cingulate cortex, posterior-cingulate cortex & precuneus cortex | R | 4, 6, 32-33, 44, 52 | 4149 | 7 | -19 | 37 | 3.68 | 5.1×10^{-5} |
| | 8 | Inferior temporal gyrus, middle temporal gyrus, temporal pole | L | 20-21, 32- | 3303 | -53 | -8 | -23 | 4.82 | 1.9×10^{-4} |
| | 9 | Insula, postcentral gyrus, supramarginal gyrus | R | 40 | 3866 | 36 | -14 | 7 | 4.23 | 1.0×10^{-3} |
| | 10 | Postcentral gyrus, supramarginal gyrus | L | 10, 46 | 2714 | -56 | -38 | 36 | 4.06 | 3.8×10^{-3} |
| | 11 | Rostral middle frontal gyrus | L | 46 | 2311 | -35 | 35 | 12 | 3.83 | 4.4×10^{-3} |
| Case < Control | | | | | | | | | | |
| | 12 | Caudal anterior-cingulate cortex | L | 24 | 338 | -1 | 21 | 16 | -5.00 | 1.0×10^{-5} |
| | 13 | Caudal anterior-cingulate cortex, posterior-cingulate cortex | R | 33 | 872 | 3 | 9 | 24 | -3.62 | 1.0×10^{-5} |
| | 14 | Uncus | R | 28 | 84 | 25 | -9 | -25 | -3.14 | 1.6×10^{-5} |

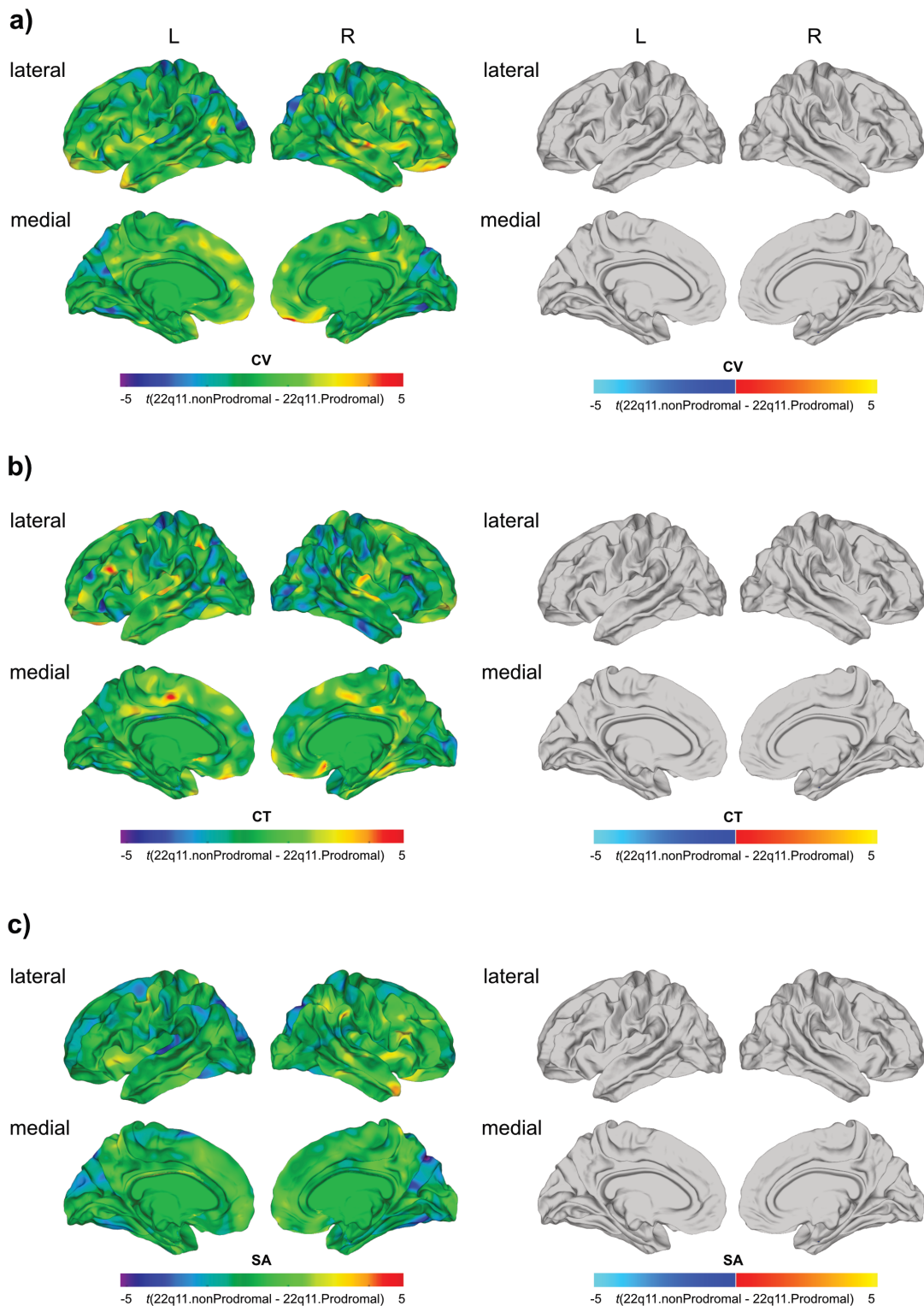
Hemisphere: L : Left, R : Right; BA: approximate Brodmann area at t_{max} ; vertices: number of vertices within the cluster; t_{max} : maximum t-statistic within the cluster; Pcluster: cluster-corrected p-value.

S3 – Cortical Thickness and Surface Area clusters of significant differences in 22q11.2DS compared to controls

| Contrast | Cluster | Region Labels | Hemisphere | BA | Vertices | Talairach | | | t_{max} | $p_{cluster}$ |
|----------------|---------|--|------------|--|----------|-----------|-----|----|-----------|----------------------|
| | | | | | | x | y | z | | |
| SA | | | | | | | | | | |
| Case < Control | | | | | | | | | | |
| | 1 | Banks superior temporal sulcus, caudal anterior-cingulate cortex, caudal middle frontal gyrus, cuneus cortex, entorhinal cortex, frontal pole, fusiform gyrus, inferior parietal cortex, inferior temporal gyrus, isthmus-cingulate cortex, lateral occipital cortex, lateral orbital frontal cortex, lingual gyrus, medial orbital frontal cortex, middle temporal gyrus, paracentrale lobule, parahippocampal gyrus, pars opercularis, pars triangularis, pericalcarine cortex, postcentral gyrus, precuneus cortex, rostral anterior cingulate gyrus, rostral middle frontal gyrus, superior frontal gyrus, superior parietal cortex, superior temporal gyrus, temporal pole, transverse temporal cotex. | L | 1-7, 9-11, 17, 19-24, 32-33, 37-38, 40, 46 | 81708 | -15 | -65 | 15 | -7.12 | 4.9×10^{-6} |
| | 2 | Banks superior temporal sulcus, caudal anterior-cingulate cortex, caudal middle frontal gyrus, cuneus cortex, entorhinal cortex, frontal pole, fusiform gyrus, inferior parietal cortex, inferior temporal gyrus, isthmus-cingulate cortex, lateral occipital cortex, lateral orbital frontal cortex, lingual gyrus, medial orbital frontal cortex, middle temporal gyrus, paracentrale lobule, parahippocampal gyrus, pars triangularis, pericalcarine cortex, postcentral gyrus, posterior-cingulate cortex, precentral gyrus, precuneus cortex, rostral anterior cingulate gyrus, rostral middle frontal gyrus, superior frontal gyrus, superior parietal cortex, superior temporal gyrus, supramarginal gyrus, temporal pole, transverse temporal cotex. | R | 1-3, 17, 19-24, 28, 37-38, 40, 45-46 | 82590 | 14 | -77 | 15 | -7.30 | 4.9×10^{-6} |
| | 3 | Posterior-cingulate cortex | L | 24 | 47 | -2 | -7 | 27 | -3.27 | 2.8×10^{-2} |
| | 4 | Posterior-cingulate cortex | R | 24 | 40 | 3 | 7 | 25 | -3.64 | 3.2×10^{-2} |

Hemisphere: L: Left, R: Right; BA: approximate Brodmann area at t_{max} ; vertices: number of vertices within the cluster; tmax; maximum t-statistic within the cluster; Pcluster: cluster-corrected p-value.

S4 – Subgroup analysis of prodromal symptoms of psychosis



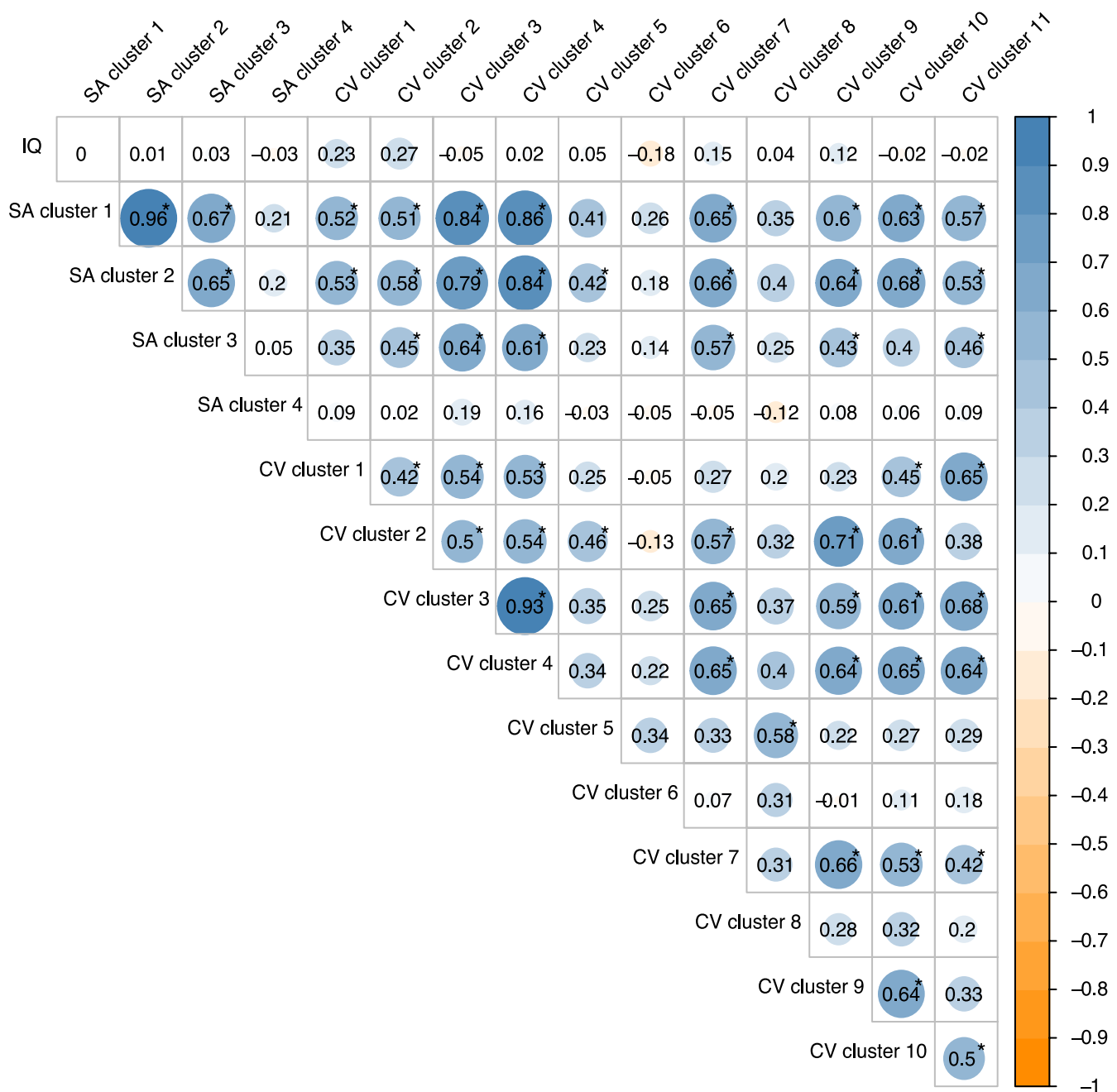
Significant differences in (a) cortical volume (CV), (b) cortical thickness (CT), and (c) surface area (SA) in individuals with 22q11.2DS and no prodromal symptoms of psychosis (22q11.nonProdromal), compared to individuals with 22q11.2DS and prodromal symptoms of psychosis (22q11. Prodromal). The left panel shows the un-thresholded t -maps, where increases in 22q11.nonProdromal relative to 22q11.Psychosis are indicated in yellow to red, and decreases in blue to purple. The right panel shows random-field-theory (RFT)-based cluster-corrected ($p < 0.05$, two-tailed) difference maps. Following correction for multiple comparisons, there were no significant group differences between 22q11.nonProdromal and 22q11. Prodromal in any of the examined cortical descriptors.

S5 – Cortical volume, cortical thickness and surface areas clusters with significant group-by-age linear interactions

| Contrast | Cluster | Region Labels | Hemisphere | BA | Vertices | Talairach | | | t_{max} | $p_{cluster}$ |
|----------|---------|---|------------|-----------|----------|-----------|-----|----|-----------|----------------------|
| | | | | | | x | y | z | | |
| CV | | | | | | | | | | |
| | 1 | Cuneus cortex, pericalcarine cortex, precuneus cortex, superior parietal cortex | R | 7, 18, 31 | 4819 | 22 | -61 | 26 | 4.48 | 4.7×10^{-4} |
| | 2 | Superior frontal gyrus | R | 8-10 | 2081 | 9 | 38 | 35 | 3.32 | 5.0×10^{-3} |
| | 3 | Cuneus cortex, pericalcarine cortex, precuneus cortex, superior parietal cortex | L | 7, 31 | 3917 | -17 | -73 | 38 | 3.56 | 5.2×10^{-3} |
| | 4 | Superior Frontal cortex | L | 6, 8-10 | 1786 | -11 | 60 | 13 | 3.33 | 4.0×10^{-2} |
| | 5 | Medial orbitofrontal cortex | L | 30 | 109 | -5 | 8 | -7 | -4.02 | 1.3×10^{-2} |
| CT | | | | | | | | | | |
| | 1 | Lingual gyrus, pericalcarine cortex | L | 17-18 | 3347 | -20 | -73 | 7 | 4.18 | 1.8×10^{-3} |
| | 2 | Cuneus cortex, pericalcarine cortex | R | 17-18 | 2477 | 23 | -67 | 6 | 3.78 | 7.5×10^{-3} |
| | 3 | Rostral middle frontal gyrus, superior frontal gyrus | L | 8-10 | 2082 | -25 | 15 | 38 | 3.35 | 1.1×10^{-2} |
| | 4 | Medial orbitofrontal cortex | L | 30 | 87 | -5 | 9 | -7 | -4.14 | 6.4×10^{-3} |
| SA | | | | | | | | | | |
| | 1 | Medial orbitofrontal cortex | L | 30 | 280 | -6 | 8 | -8 | -3.96 | 3.7×10^{-3} |
| | 2 | Precuneus, posterior cingulate cortex | L | 23, 31 | 1311 | -7 | -36 | 39 | -2.81 | 99×10^{-3} |
| | 3 | Precuneus, posterior cingulate cortex | R | 23, 31 | 3194 | 11 | -39 | 32 | -3.45 | 1.1×10^{-2} |

Hemisphere: L : Left, R : Right; BA: approximate Brodmann area at t_{max} ; vertices: number of vertices within the cluster; t_{max} : maximum t-statistic within the cluster; $p_{cluster}$: cluster-corrected p-value.

S6 – Group-by-IQ associations



Correlations between IQ and clusters with significant group difference in cortical volume (CV) and surface area (SA) between individuals with 22q11.DS and typically developing controls. Positive correlations are indicated in blue, negative correlations are indicated in orange. Significant correlations ($p < 0.05$, Bonferroni corrected) are highlighted with *.

S7 – Cortical Volume clusters of significant differences in 22q11.2DS compared to controls

| Contrast | Cluster | Region Labels | Hemisphere | BA | Vertices | Talairach | | | t_{max} | $p_{cluster}$ |
|----------------|---------|---|------------|------------------|----------|-----------|-----|-----|-----------|----------------------|
| | | | | | | x | y | z | | |
| CV | | | | | | | | | | |
| Case > Control | | | | | | | | | | |
| | 1 | Precentral gyrus, superior frontal gyrus | R | 4, 6 | 3418 | 20 | -5 | 53 | 4.36 | 2.2×10^{-3} |
| Case < Control | | | | | | | | | | |
| | 2 | Caudal anterior-cingulate cortex, cuneus cortex, fusiform gyrus, | L | 4-5, 7, 9, | 37968 | -22 | -43 | -4 | -7.23 | 8.2×10^{-6} |
| | 3 | Cuneus cortex, fusiform gyrus, inferior parietal cortex, inferior temporal gyrus, isthmus-cingulate cortex, lateral occipital | R | 17-20, 30-31, 37 | 18695 | 24 | -58 | 21 | -5.50 | 8.2×10^{-6} |
| | 4 | Caudal anterior-cingulate cortex, isthmus-cingulate cortex, posterior-cingulate cortex, rostral anterior cingulate cortex, | R | 8-9, 23-24, 32 | 6649 | 6 | 6 | 29 | -5.09 | 8.2×10^{-6} |
| | 5 | Entorhinal cortex, fusiform gyrus, inferior temporal gyrus | L | 20, 37 | 1922 | -36 | -30 | -17 | -4.87 | 9.4×10^{-6} |
| | 6 | Uncus | R | 28 | 118 | 25 | -9 | -25 | -3.13 | 1.2×10^{-5} |
| | 7 | Uncus | L | 28 | 495 | -30 | -1 | -24 | -3.32 | 4.2×10^{-4} |
| | 8 | Rostral middle frontal gyrus | R | 9, 46 | 3034 | 3 | 37 | 18 | -4.00 | 4.2×10^{-4} |
| | 9 | Superior temporal gyrus, transverse temporal cortex | R | 22, 42, 38 | 3482 | 47 | 10 | -22 | -3.40 | 2.1×10^{-3} |
| | 10 | Banks superior temporal sulcus, inferior parietal cortex, middle temporal gyrus | R | 39-40 | 3309 | 57 | -53 | 8 | -4.12 | 5.2×10^{-3} |
| | 11 | Paracental lobule, superior frontal gyrus | R | 1-4, 24 | 2379 | 15 | -14 | 40 | -3.14 | 2.3×10^{-2} |

Hemisphere: L: Left, R: Right; BA: approximate Brodmann area at tmax; vertices: number of vertices within the cluster; tmax; maximum t-statistic within the cluster; Pcluster: cluster-corrected p-value. A2:L32