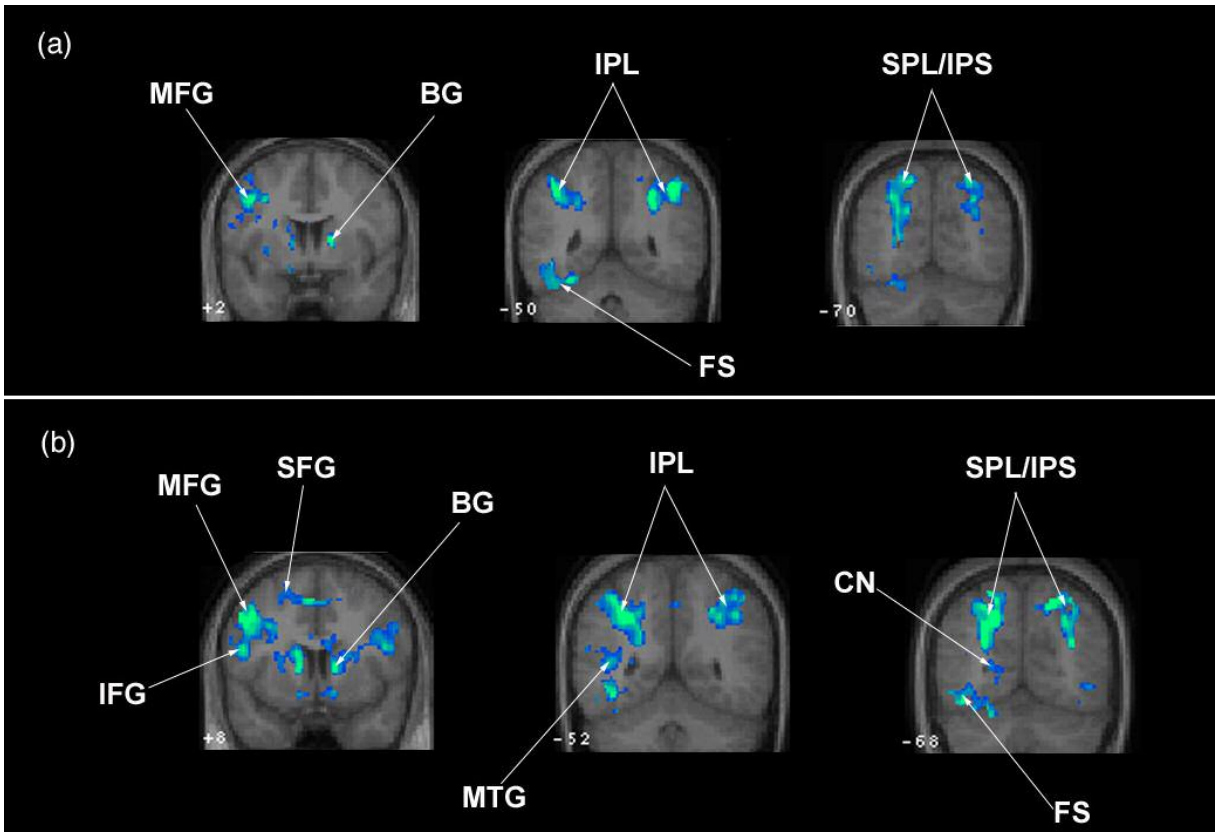
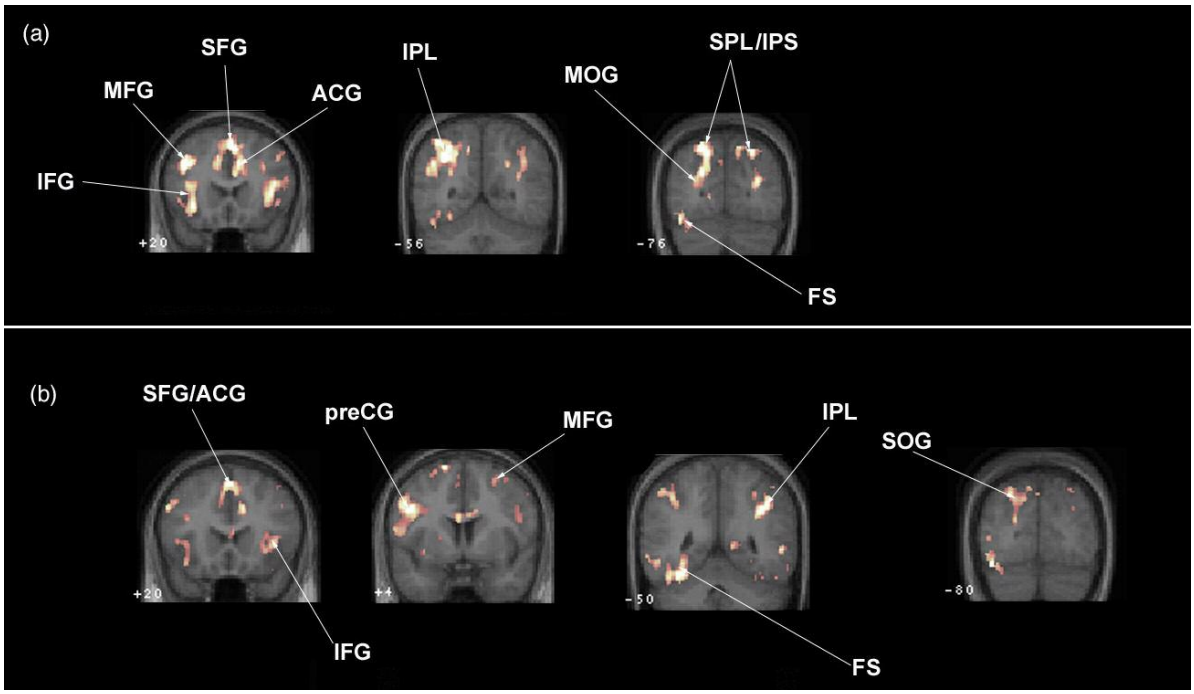
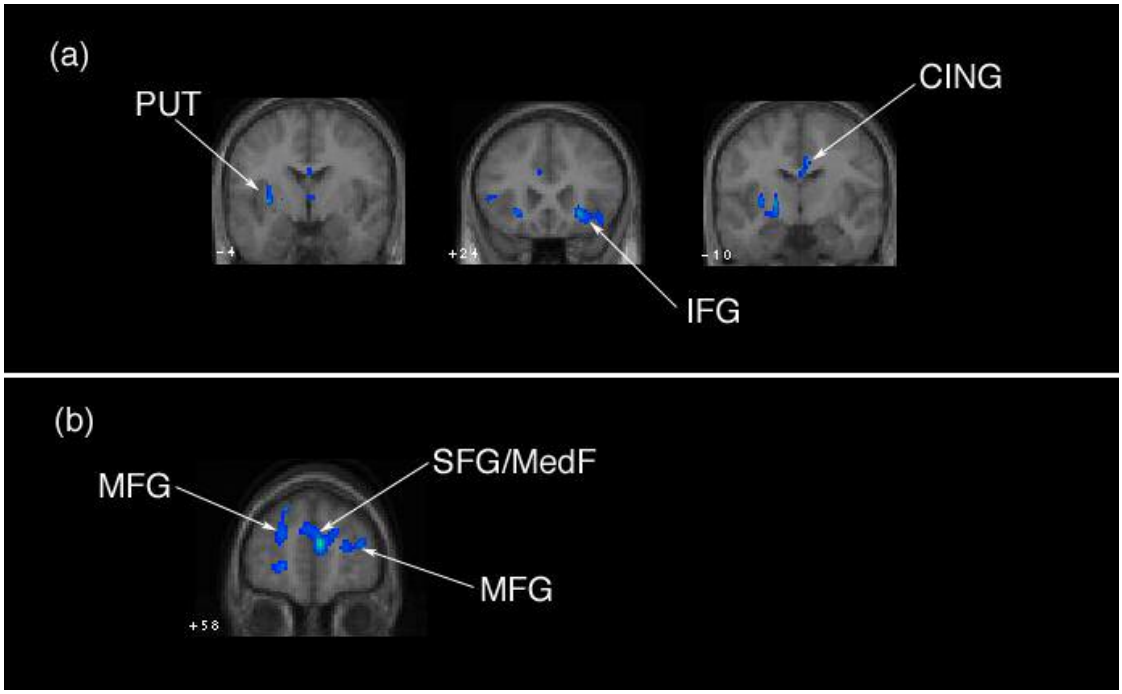
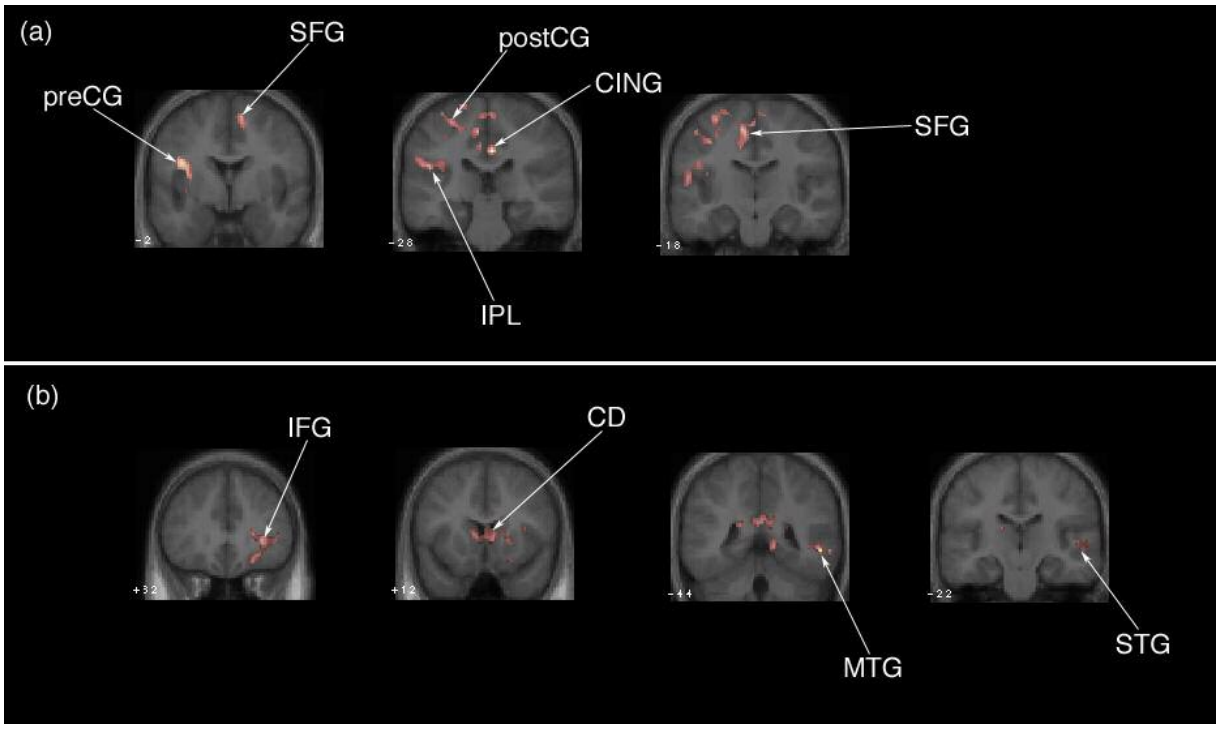
Supplementary Figure 1: Within-group results for age-matched controls showing regions of significant activation during the 2-operand math task (a) including inferior parietal lobe (IPL), left fusiform (FS), right basal ganglia (BG), superior parietal lobule (SPL), intraparietal sulcus (IPS) and left middle frontal gyrus (MFG). During the 3-operand math task (b) controls showed activation in the superior parietal lobule (SPL), inferior parietal lobe (IPL), intraparietal sulcus (IPS), middle (MFG), superior (SFG) and inferior (IFG) frontal gyri, left fusiform (FS), cuneus (CN), posterior middle temporal gyrus (MTG) and basal ganglia (BG).



Supplementary Figure 2: Within-group results for individuals with TS showing regions of significant activation during the 2-operand math task (a) including inferior parietal lobe (IPL), superior parietal lobe (SPL), intraparietal sulcus (IPS), middle (MFG) and inferior (IFG) frontal gyri extending into pre- and postcentral gyri, superior frontal gyrus (SFG) extending into anterior cingulate (ACG), left middle occipital gyrus (MOG) extending into left fusiform (FS). During the 3-operand math task (b) the TS group showed activation in the inferior parietal lobe (IPL), left fusiform (FS), left precentral gyrus (preCG) extending into middle (MFG) and inferior (IFG) frontal gyri, superior frontal gyrus (SFG) extending into anterior cingulate (ACG) and left superior occipital gyrus (SOG).



Supplementary Figure 3: Control within-group results for *post hoc* comparison of 2-operand and 3-operand tasks showing (a) greater activation during the 2-operand task in the left putamen (PUT), right inferior frontal gyrus (IFG) and cingulate (CING) and (b) greater activation during the 3-operand task in the medial frontal (MedF), bilateral superior frontal (SFG) and bilateral middle frontal (MFG) gyri.



Supplementary Figure 4: TS within-group results for *post hoc* comparison of 2-operand and 3-operand tasks showing (a) greater activation during the 2-operand task in left pre- (preCG) and post- central (postCG) gyri, cingulate (CING), bilateral superior frontal gyri (SFG) and left inferior parietal lobe (IPL). There were no significant areas of activation in the 3-operand minus 2-operand contrast for the TS group at the *a priori* threshold of $p < .05$. However, when the threshold was lowered to 0.1, (b) activation occurred in the right middle (MTG) and superior (STG) temporal gyri, bilateral caudate (CD) and right inferior frontal gyrus (IFG).