SUPPLEMENTARY INFORMATION

Table S1. **Mean Regional Volumes by Diagnostic Group.** Whole brain and hippocampal volumes were computed using a protocol published previously by our group [1]. Manually delineated dorsal caudate volumes were segmented according to a previous protocol [2] except that rather than ending segmentations at the anterior cingulate, caudate was included as long as it was visible along the superiolateral border of the lateral ventricle in the coronal view.

	NC (n=9)	MUT-Norm (n=9)	MUT-aMCI (n=12)	MUT-Dem (n=3)		
Regional Volumes (mm^3)	Mean (sd)	Mean (sd)	Mean (sd)	Mean (sd)	$F_{3,29}$	p
Whole Brain	$1.58x10^6$ $(0.06x10^6)^{a}$	$1.53x10^6$ $(0.08x10^6)$	$1.56x10^6$ $(0.04x10^6)^{b}$	$1.41x10^6$ $(0.03x10^6)^{ab}$	6.12	.002
Hippocampus	$8.44x10^3$ $(0.76x10^3)^{a}$	$8.52x10^3$ $(0.97x10^3)^{b}$	$8.44x10^3$ $(0.55x10^3)^{c}$	$6.87x10^3$ $(0.71x10^3)^{abc}$	4.09	.02
Caudate	$10.25x10^3$ $(1.15x10^3)$	$9.41x10^3$ $(1.50x10^3)$	$10.43x10^3$ $(0.97x10^3)$	$9.89x10^3$ $(1.20x10^3)$	1.35	.28

^{abc} groups denoted by different letters differ by $p < .05$.

[1] Apostolova LG, Hwang KS, Medina LD, et al. Cortical and hippocampal atrophy in patients with autosomal dominant familial Alzheimer's disease. *Dement Geriatr Cogn Disord*. 2011;32:118-25.

[2] Mawlawi O, Martinez D, Slifstein M, et al. Imaging Human Mesolimbic Dopamine Transmission With Positron Emission Tomography[colon] I. Accuracy and Precision of D2 Receptor Parameter Measurements in Ventral Striatum. *J Cereb Blood Flow Metab*. 2001;21:1034-57.

Figure S1. Associations between ROI brain volumes and relative age in non-demented mutation carriers (MUT-Norm, MUT-aMCI). Scatterplots and trend lines show the association between relative age (in years) and ROI volumes (% relative to the MDT) of the (a) ventricles, (b) temporal lobes, and (c) caudate in non-demented mutation carriers (MUT-Norm, MUT-aMCI) with and without memory complaints.

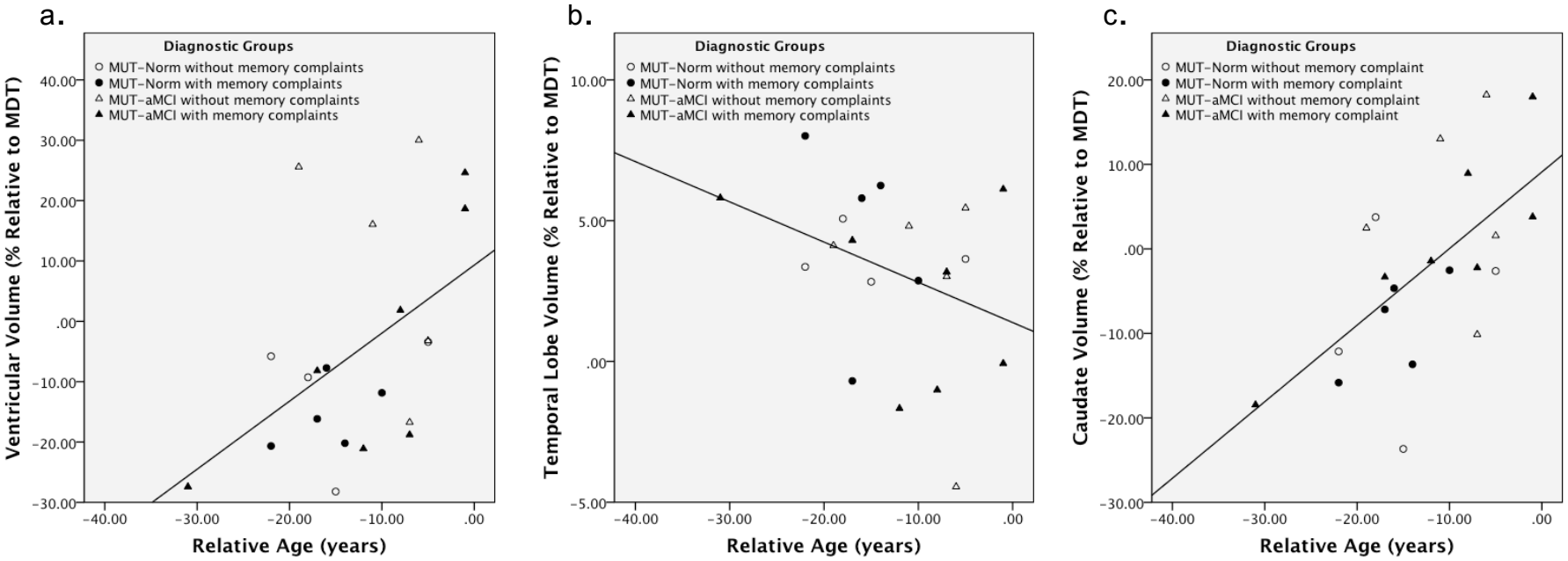
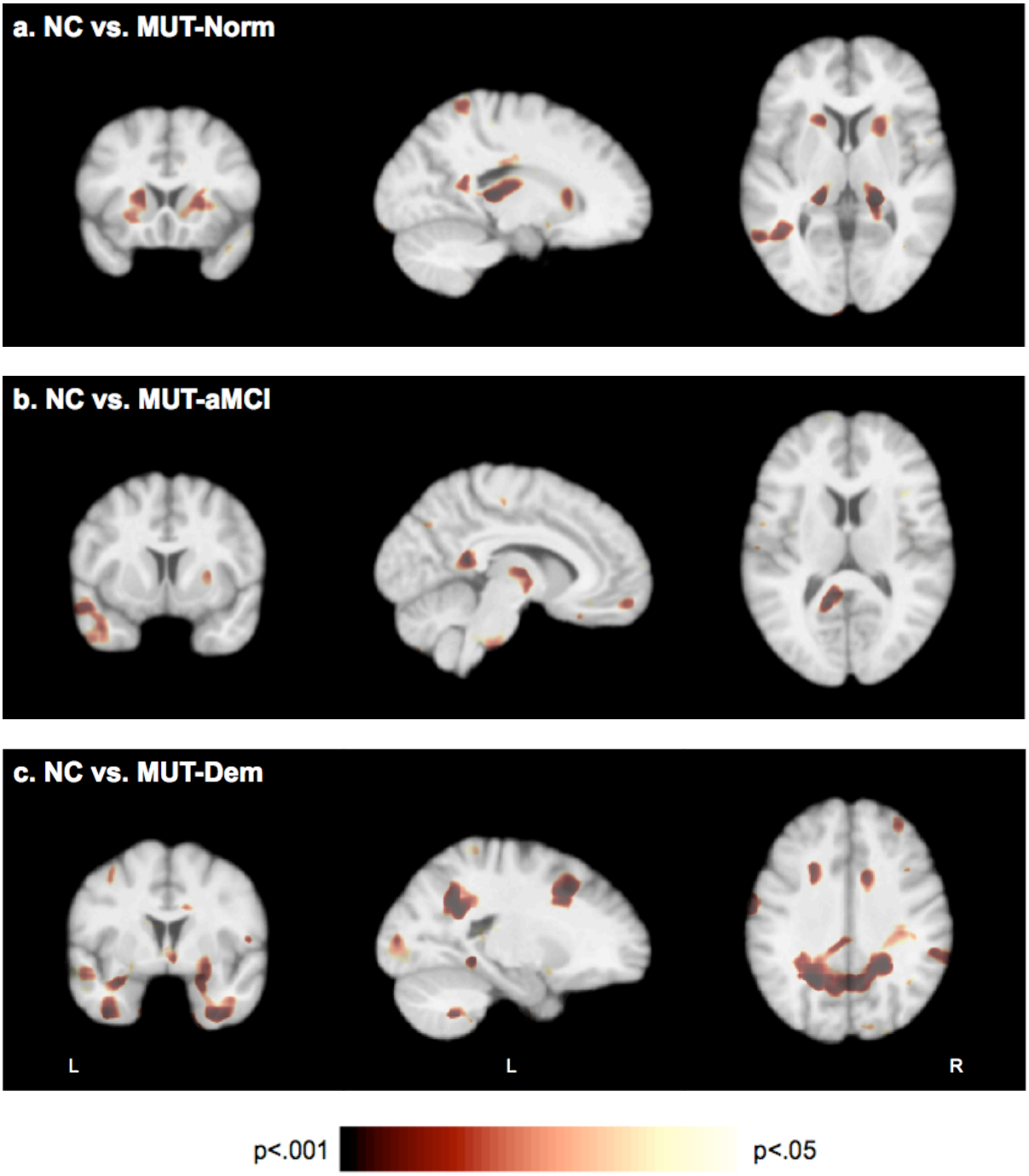
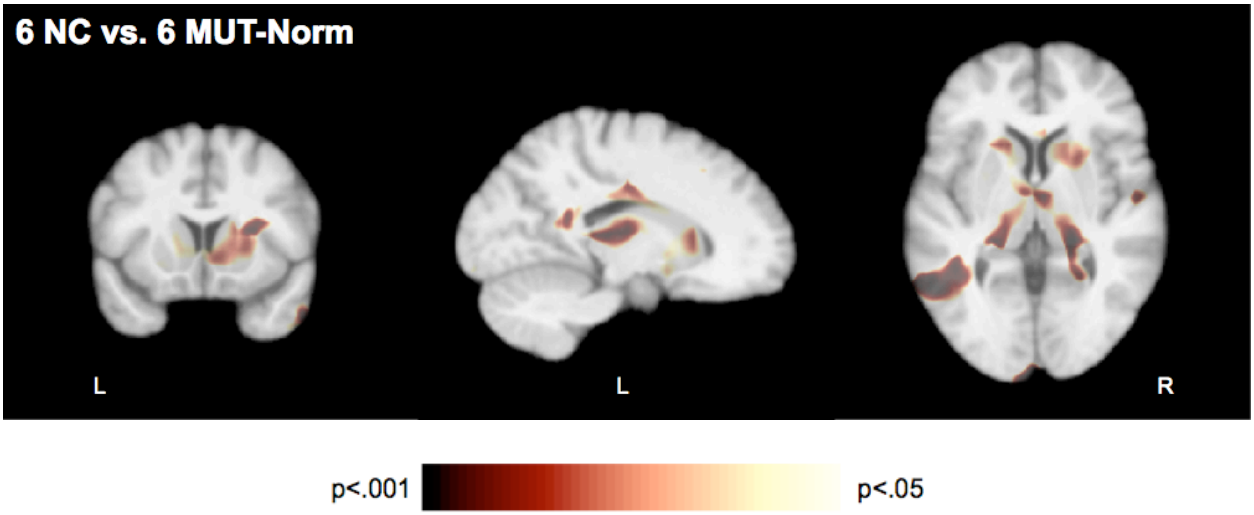


Figure S2. Age-adjusted statistical p-maps of group differences in brain volume between the NC group and MUT-Norm, MUT-aMCI and MUT-Dem groups.



After controlling for age, the MUT-Norm group demonstrated smaller volume than the NC group in the basal ganglia and thalamus (a). The MUT-aMCI group exhibited smaller volume than the NC group in the thalamus, splenium, and left temporal lobe (b). The MUT-Dem group had smaller volume than the NC group in temporal, parietal and frontal regions (c).

Figure S3. Statistical p-maps of group differences between 6 MUT-Norm and 6 age-matched NC control subjects.



A subset of 6 MUT-Norm subjects (*M* age=32.67 years, *SD*=4.37) and 6 age-matched NC subjects (*M* age=33.33 years, *SD*=4.37) were compared to yield the p-map above, which shows clusters of voxels in the caudate and thalamus where MUT-Norm subjects have smaller volume than NC subjects.