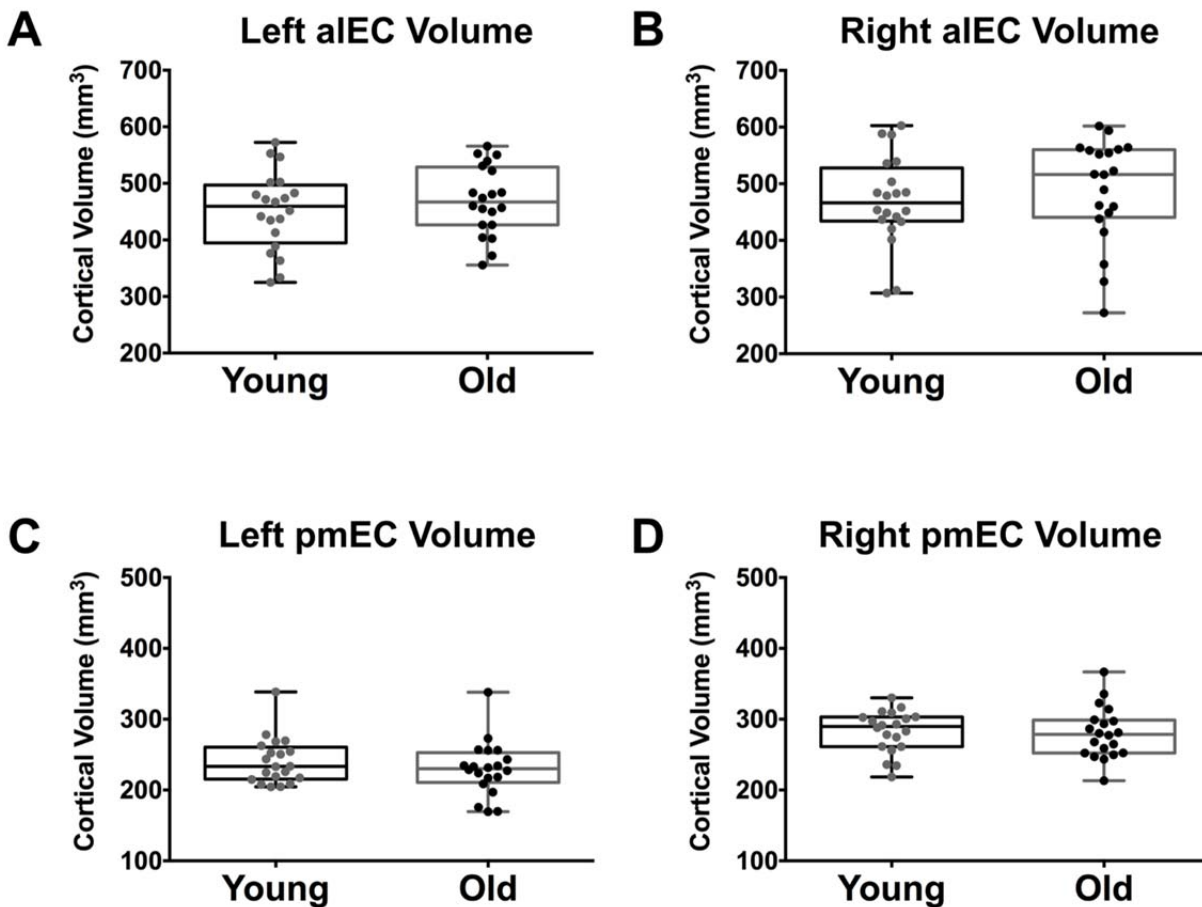


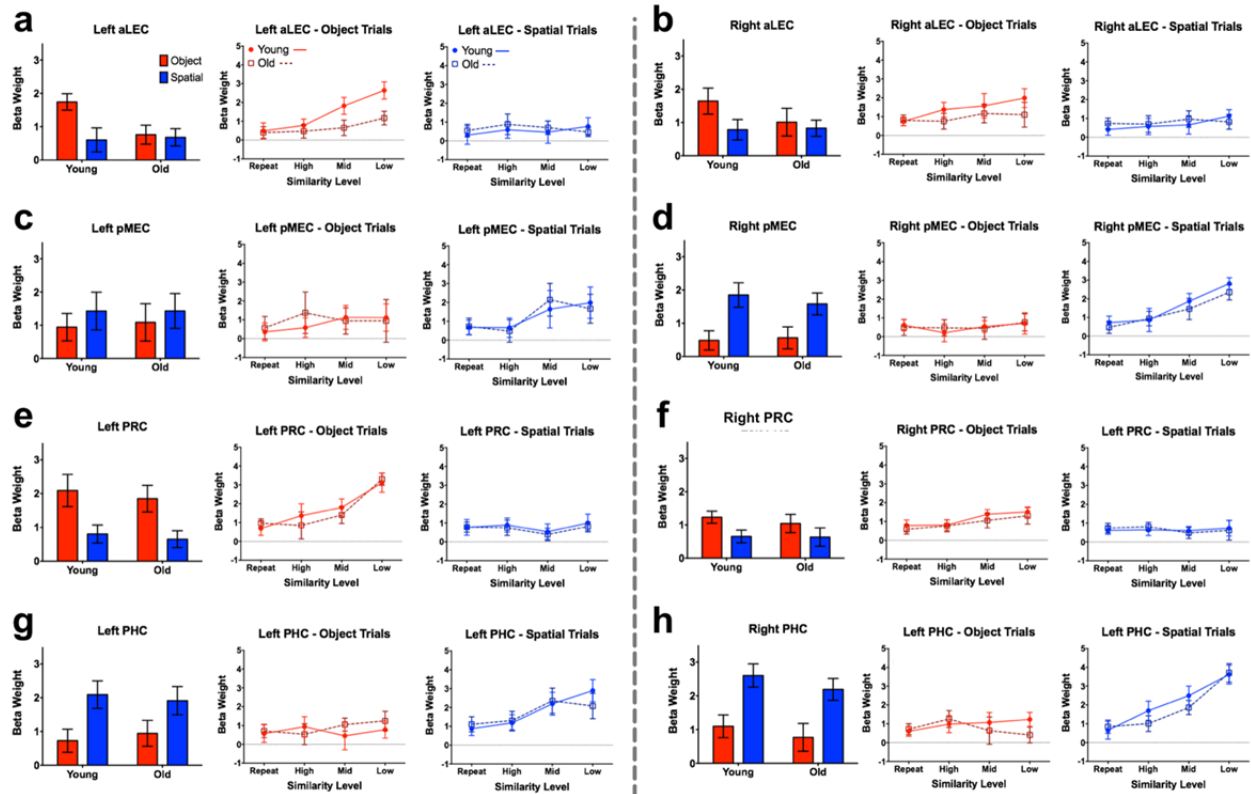
Functional imbalance of anterolateral entorhinal cortex and hippocampal dentate/CA3 underlies age-related object pattern separation deficits

Reagh, Z.M., Noche, J.A., Tustison, N.J., Delisle, D., Murray, E.A., Yassa, M.A.

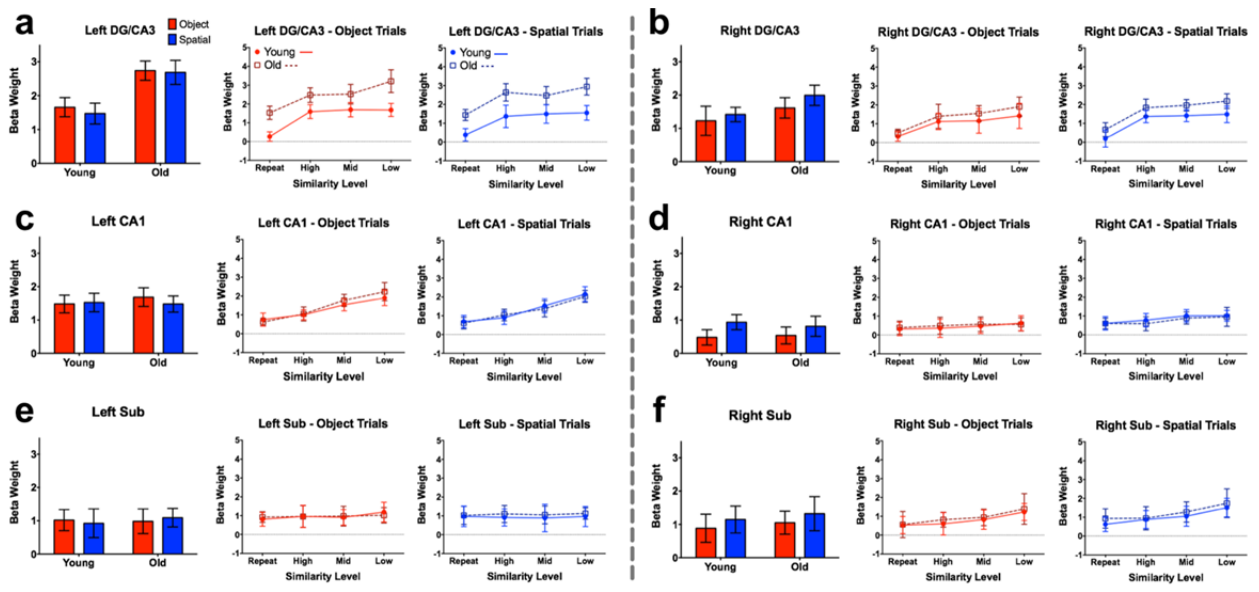
Supplemental Information



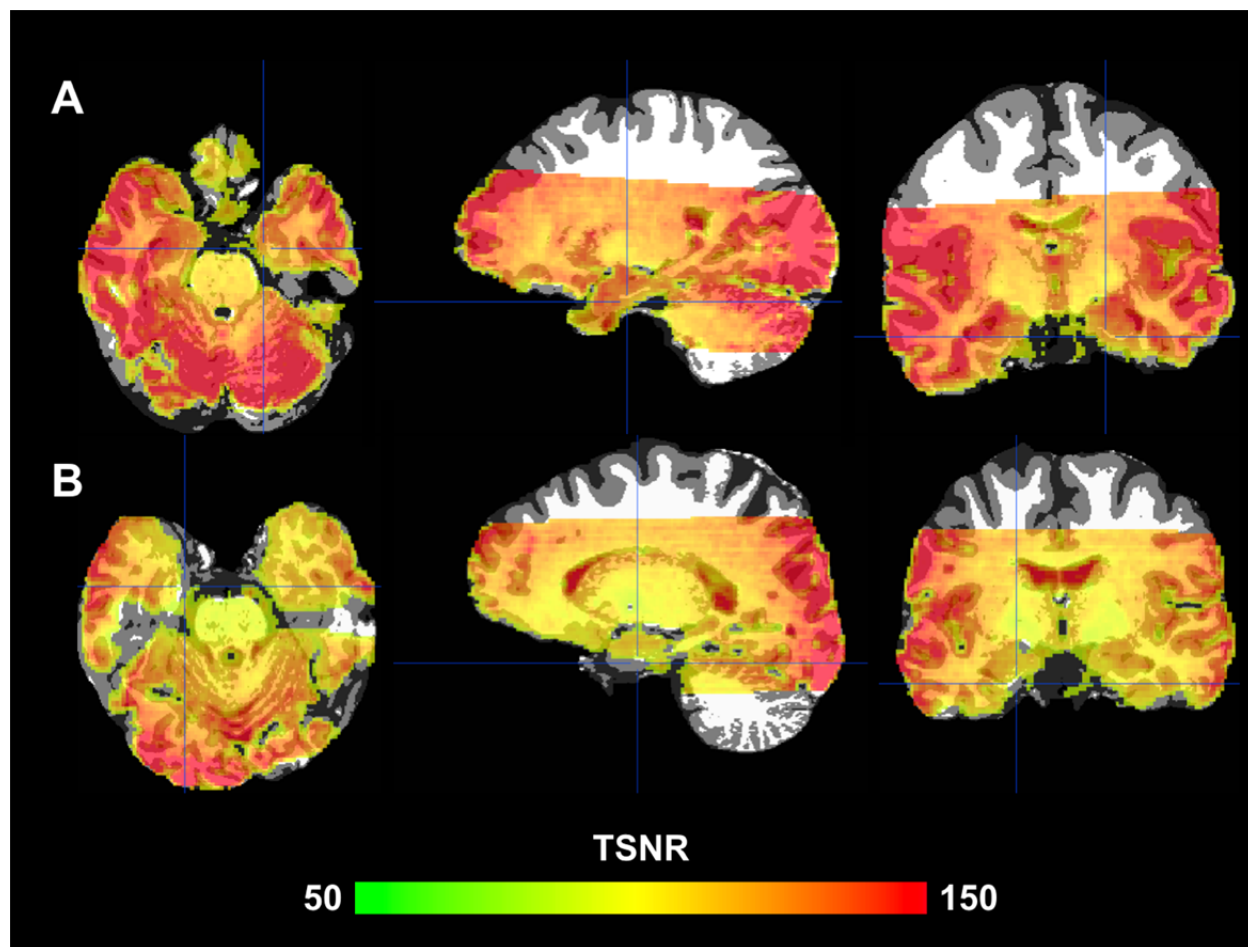
Supplemental Figure 1, related to Figure 3: Cortical volume measurements across young and old participants. Multi-atlas label fusion was used as a data-driven approach to labeling individual subjects' brains with our ROIs (see Methods for details), and estimates of volume for each ROI (in mm³) were extracted. No group differences were observed in A) left aIEC, B) right aIEC, C) left pmEC, or D) right pmEC.



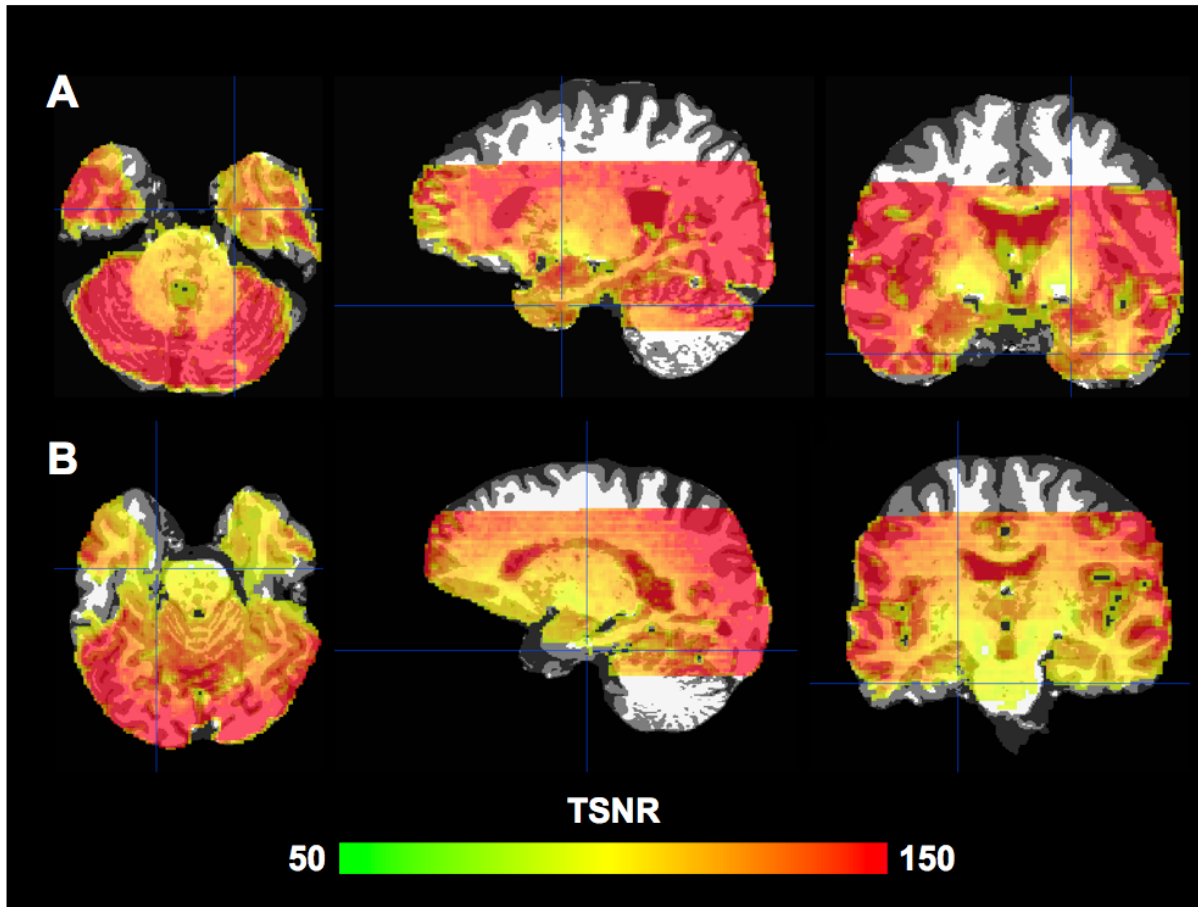
Supplemental Figure 2, related to Figure 3: All cortical ROIs (bilateral aLEC, pMEC, PRC, and PHC) as engaged by object and spatial discrimination in the task.



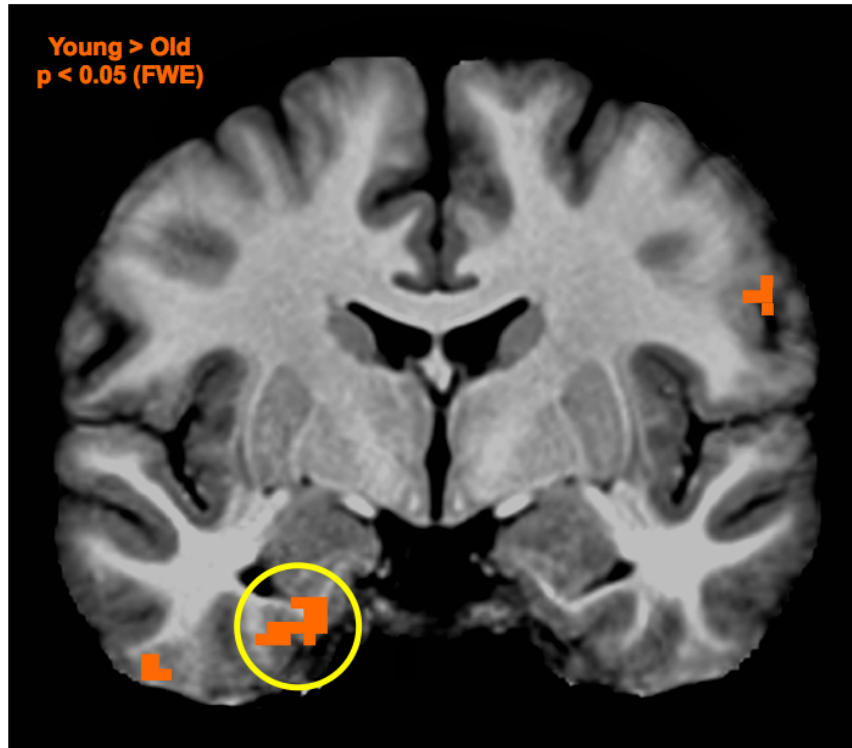
Supplemental Figure 3, related to Figure 4: All hippocampal ROIs (bilateral DG/CA3, CA1, and subiculum) as engaged by object and spatial discrimination in the task.



Supplemental Figure 4, related to Imaging Methods: Examples of TSNR maps obtained from two representative young subjects. Subjects with A) relatively good, and B) relatively poor TSNR in the MTL are shown. Note the “missing” voxels with TSNR < 50 in the EC, focused by the crosshairs.



Supplemental Figure 5, related to Imaging Methods: Examples of TSNR maps obtained from two representative older subjects. Subjects with A) relatively good, and B) relatively poor TSNR in the MTL are shown. Note the “missing” voxels with TSNR < 50 in the EC, focused by the crosshairs.



Supplementary Figure 6, related to Fig. 3: Contrast (t-test) of voxels showing greater activity in young adults compared to older adults during object discrimination (collapsed across similarity). Data were corrected to control familywise error (FWE) at a level of $p < 0.05$. A significant cluster of voxels was observed spanning left aLEC and PRC.

Region	Age		Test Domain		Interaction	
	F(1,38)	p	F(1,38)	p	F(1,38)	p
L aLEC	1.801	0.186	6.683	0.014	5.071	0.031
R aLEC	0.725	0.399	2.264	0.141	0.959	0.334
L pMEC	0.015	0.902	0.905	0.348	0.026	0.872
R pMEC	0.075	0.786	15.22	<0.001	0.317	0.577
L PRC	0.265	0.609	14.29	<0.001	0.018	0.894
R PRC	0.123	0.663	4.624	0.038	0.135	0.715
L PHC	0.002	0.966	15.79	<0.001	0.462	0.501
R PHC	0.744	0.394	30.55	<0.001	0.024	0.877
L DG/CA3	10.89	0.002	0.205	0.653	0.066	0.798
R DG/CA3	1.979	0.168	0.846	0.366	0.095	0.76
L CA1	0.061	0.806	0.177	0.677	0.418	0.522
R CA1	0.014	0.906	2.575	0.117	0.157	0.694
L Subiculum	0.031	0.862	<0.001	0.985	0.093	0.762
R Subiculum	0.155	0.696	0.412	0.525	<0.001	0.991

Supplemental Table 1, related to Fig. 3 and 4: Age and Domain Effects, Collapsed Across Similarity. Regional effects, comparing test domains and collapsed across lure similarity. F-statistics and p-values are presented for two-way (Age x Test Domain) mixed ANOVAs across ROIs. Significant effects are bolded.

Region	Age		Object Similarity		Interaction	
	F(1,38)	p	F(3,114)	p	F(3,114)	p
L aLEC	4.613	0.038	7.192	<0.001	1.805	0.15
R aLEC	1.005	0.322	1.429	0.238	0.489	0.691
L pMEC	0.069	0.795	0.28	0.839	0.195	0.899
R pMEC	0.005	0.942	0.286	0.836	0.08	0.971
L PRC	0.051	0.822	15.68	<0.001	0.558	0.644
R PRC	0.447	0.508	3.011	0.033	0.092	0.965
L PHC	0.162	0.689	0.279	0.84	0.532	0.661
R PHC	0.224	0.639	0.523	0.668	0.91	0.439
L DG/CA3	10.02	0.003	6.22	<0.001	0.382	0.767
R DG/CA3	0.66	0.422	2.585	0.057	0.04	0.989
L CA1	0.132	0.718	8.86	<0.001	0.247	0.863
R CA1	0.039	0.844	0.153	0.928	0.025	0.995
L Subiculum	<0.001	0.999	0.1	0.96	0.038	0.999
R Subiculum	0.07	0.792	0.845	0.472	0.013	0.998

Supplemental Table 2, related to Fig. 3 and 4: Age and Similarity Effects – Object Trials. Regional effects during object trials, considering similarity levels of items at test. F-statistics and p-values are presented for two-way (Age x Similarity) mixed ANOVAs across ROIs. Significant effects are bolded.

Region	Age		Spatial Similarity		Interaction	
	F(1,38)	p	F(3,114)	p	F(3,114)	p
L aLEC	0.075	0.786	0.228	0.876	0.279	0.84
R aLEC	0.111	0.741	0.495	0.687	0.327	0.806
L pMEC	<0.001	0.984	2.519	0.062	0.161	0.922
R pMEC	0.372	0.546	12.11	<0.001	0.23	0.875
L PRC	0.121	0.73	0.644	0.588	0.033	0.992
R PRC	0.003	0.961	0.152	0.928	0.14	0.936
L PHC	0.024	0.877	4.818	0.003	0.538	0.657
R PHC	0.35	0.558	21.46	<0.001	0.727	0.538
L DG/CA3	9.01	0.004	4.345	0.006	0.111	0.954
R DG/CA3	2.871	0.098	6.658	<0.001	0.046	0.987
L CA1	0.026	0.872	8.502	<0.001	0.099	0.96
R CA1	0.072	0.79	0.84	0.475	0.036	0.991
L Subiculum	0.079	0.78	0.011	0.998	0.001	0.999
R Subiculum	0.12	0.731	1.745	0.162	0.033	0.992

Supplemental Table 3, related to Fig. 3 and 4: Age and Similarity Effects – Spatial Trials. Regional effects during spatial trials, considering similarity levels of items at test. F-statistics and p-values are presented for two-way (Age x Similarity) mixed ANOVAs across ROIs. Significant effects are bolded.