Supporting Information

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Fig. S1. Shown is percentage correct for the 40 sessions from 25 patients (n = 40) split into low and high performers. Lure 1 is the most similar and lure 3 is the least similar photograph to the target photograph, and the foil image is a novel photograph of an unstudied face.



Fig. S2. (A) High-resolution MRI showing a left medial hippocampal (LMH) electrode location. (B) The 3D gray matter of the medial temporal lobe was created by manual segmentation of the gray matter on the high-resolution MRI. (C) An example patient's 2D flat map was created by unfolding the 3D gray matter and projecting electrode locations (shown in red). Regions shown are CA2, CA3, and dentate gyrus (CA23DG), anterior CA fields and dentate gyrus (CADG), CA1, subiculum, entorhinal cortex (ERC), parahippocampal cortex, perirhinal cortex (PRC), and fusiform cortex.



Fig. S3. Increase in average firing rate ratio (poststimulus compared with baseline) across all sessions (n = 40) during recognition of the target, lures, and foil images in regions hippocampus (A), parahippocampal gyrus (combined entorhinal and parahippocampal cortex) (B), and amygdala (C). Error bars show the SEM.

DNAS



Fig. S4. Normalized average number of spikes for each trial during encoding and retrieval. Shown is the average spike counts for all units within the MTL regions (*A*) as well as within individual MTL areas including the CA3DG (*B*), subiculum (*C*), entorhinal cortex (*D*), parahippocampal cortex (*E*), and amygdala (*F*). Error bars reflect SEM.



Fig. S5. Spearman correlation coefficient values between behavioral discrimination indices and target-lure 1 firing rate changes for specific learned target items within each individual subject. Rho values across subjects were significantly above zero within the (*A*) hippocampus (average $\rho = 0.32$; *P* < 0.05) but not within the (*B*) parahippocampal gyrus (average $\rho = 0.05$; *P* > 0.05).



Fig. S6. Two example subjects (A and B) scatterplots of behavioral discrimination indices and hippocampal target-lure 1 firing rate changes for specific learned target items.

Table S1.	Patient	electrode	localizations
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#1 RAH CA3DG #12 RAH Subiculum LPG LPHC REC REC RPG RPHC LEC LEC RA Amygdala LA Amygdala LA Amygdala LA Amygdala LA Amygdala LA Amygdala LA Amygdala LA Amygdala LA LA H Subiculum LA Amygdala LA Amygdala LEC LEC RC Not in gray matter LPG LPHC1 LEC EC LA Amygdala #14 RAH CA3DG RA Amygdala LA Amygdala CA RA Amygdala RA Amygdala RA RA Amygdala RA Amygdala LA RA Amygdala RA Amygdala LA LA Amygdala LA Amygdala LA LA Amygdala LA Amygdala LA RA Am	Patient	Placement	Localization	Patient	Placement	Localization
LAH Subiculum LAH CA3DG LPG LPHC REC REC RPG RPHC LEC LEC RA Amygdala LA Amygdala #2 RAH RAH #13 RMH Subiculum LA Amygdala LA Amygdala #2 RAH RAH #13 RMH Subiculum LA Amygdala LA Amygdala RPG RPHC LA Amygdala RPG RPHC LA Amygdala RA Amygdala #14 RAH CA3DG LA Amygdala #14 RAH CA3DG RPG RPHC LA Amygdala RA Amygdala #14 RAH CA3DG LA Amygdala E14 RAH CA3DG LA Amygdala E14 RAH CA3DG LA Amygdala LA Amygdala RA Amygdala RA Amygdala RA Amygdala LA Amygdala RA Amygdala RA Amygdala RA Amygdala LA Amygdala HA Amygdala LA Amygdala RA Amygdala LA Amygdala HA Amygdala LA Amygdala HA Amygdala LA Amygdala LA Amygdala LA Amygdala HA Amygdala LA Amygdala LA Amygdala LA Amygdala HA Amygdala LA Amygdala HA Amygdala LA Amygdala HA Amygdala LA Amygdala LEC LEC REC RA Amygdala LEC REC RA Amygdala LEC LEC LEC LA Amygdala LEC LEC LEC LA Amygdala LEC LEC REC RA Amygdala LEC LEC LEC LA Amygdala LEC LEC LEC LA Amygdala LEC REC RA Amygdala LEC LEC LEC LEC LEC RA Amygdala RA Amygdala LEC LEC LEC LA Amygdala RC RPHC #17 LMH Subiculum RA Amygdala RA Amygdala LEC LEC LEC LA Amygdala REC REC REC RA Amygdala RA Amygdala REC REC RA Amygdala REC REC RA Amygdala REC REC RA Amygdala RA Amygdala LEC LEC #11 KAH CA3DG LA Amygdala REC LEC RA Amygdala REC REC RA Amygdala REC REC RA Amygdala REC REC RA Amygdala REC REC REC REC LEC H19, #25 RAH CA3DG RPH CA1 REC REC LEC REC REC LEC LEC LEC LEC RA Amygdala REC REC REC REC REC LEC LEC LEC RA Amygdala REC REC REC REC REC LEC LEC RA Amygdala REC REC REC REC LEC REC REC REG RPHC LAH CA3DG RA Amygdala REC REC REC REC REC LEC LEC REC REC REC REC LEC REC REC REC REC REC REG RPHC REC REC REC REG RPHC REC REC REC REC REC REC REC REC REG RPHC RE	#1	RAH	CA3DG	#12	RAH	Subiculum
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LAHLAHLAHCA1RECRECRAAmygdalaLECLECLAAmygdalaRPGRPHC#16RAHSubiculumLPGLPHCLAHSubiculumRAAmygdalaLECLEC#5RAHCA3DGRPGRPHCLAHCA3DGLPGLPHCRECRECRECRECRECRECLAAmygdalaLECLALAMygdalaLECLAHCA3DGLPGLPHCRECRECRECRECRECRECLAAmygdalaLPGLPHCRECRECRAAmygdalaRAAmygdalaLAAmygdalaRAAmygdalaLAAmygdalaRAAmygdalaRECRECLAAmygdalaRECRECHI8LMHCA3DGRECRECHI9#25RAHCA3DGRECRECRECLECLECLECLEC#19, #25RAHCA3DGREGRPHCLAHCA3DGRECREGRPHC#20RECRECRAAmygdalaLECLECLECLEC#21RAHCA3DGREGRPHC#22RMHCA3DGRAAmygdalaLECLECSubiculumLEGLPHCLECSubiculumLPGLPHCLECLECL	#4	RAH	RAH	#15	RAH	CA3DG
REC REC RA Amygdala LEC LA Amygdala RPG RPHC #16 RAH Subiculum LPG LPHC LAH Subiculum RA Amygdala LEC REC #5 RAH CA3DG LPG LPHC REC REC RA Amygdala LEC LA Amygdala LEC REC REC RA Amygdala LEC LAH CA3DG LPG LPHC REC REC RA Amygdala LEC LPG LPHC #17 LMH Subiculum LPG LPHC REC REC REC RA Amygdala LEC LEC LEC LA Amygdala LEC LEC LEC LA Amygdala REC Fusiform gyrus REC REC REC LEC LEC LA Amygdala LEC LEC LEC LPG LPHC #20		LAH	LAH		LAH	CA1
LEC LEC LA Amygdala RPG RPHC #16 RAH Subiculum RA Amygdala REC REC LA Amygdala LEC LEC #5 RAH CA3DG RPG RPHC LAH CA3DG LPG LPHC REC REC RA Amygdala LEC LEC LEC LA Amygdala LEC LEC LEC LEC LEC RA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala RA Amygdala RPG RPHC #17 LMH Subiculum LPG LPHC REC REC LA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala RA Amygdala #7 RAH CA3DG #18 LMH CA3DG RPH CA1 REC Fusiform gruss REC REC LEC LEC LEC LEC LEC #19, #25 RAH CA3DG RPG RPHC HAH CA3DG RPG RPHC LAH CA3DG RPG RPHC LC LEC REC LEC LEC #22 RMH CA3DG RPG RPHC LEC LEC LA Amygdala H21 RAH CA3DG RPG RPHC LEC LEC LA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala REC REC RA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala REC REC RA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala LEC LEC RPG RPHC LEC Subiculum LPG LPHC HPG LPHC LEC LEC #22 RMH CA3DG RA Amygdala REC REC RA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala REC REC LA Amygdala REC REC LA Amygdala REC REC LA Amygdala REC REC LA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala REC REC LA Amygdala REC REC LA Amygdala LEC LEC LEC LEC H23 RAH CA3DG RA Amygdala REC REC LA Amygdala LEC LEC LA Amygdala REC REC LA Amygdala REC REC LA Amygdala LEC LEC LEC LEC LEC LEC LEC LEC LEC LA Amygdala REC REC LA Amygdala REC REC REC REC LEC LEC Subiculum RPG RPHC		REC	REC		RA	Amygdala
RPGRPHC#16RAHSubiculumLPGLPHCLAHSubiculumRAAmygdalaRECRECLAAmygdalaLECLEC#5RAHCA3DGLPGLPHCRECRECRECRAAmygdalaLECLECLAHCA3DGLPGLPHCRECRECRAAmygdalaLECLAAmygdalaRPGRPHC#17LMHSubiculumLPGLPHCRECRAAmygdalaLECLECLAAmygdalaRAAmygdala#7RAHCA3DGLAAmygdala#7RAHCA3DG#18LMHCA3DGRECRECHI8LMHCA3DGRECRECHICLAHCA3DGRECRECHICLAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECRECRECRECRAAmygdalaHECLECLAAmygdalaRECRECRAAmygdalaRECRECRAAmygdalaRECRECRAAmygdalaLECLECLPGLPHCLPGLPHCLPGLPHCLECSubiculumLPGLPHCLECLECRAAmygdalaRECRECRPGRPHCHIARARAAmygdala <td></td> <td>LEC</td> <td>LEC</td> <td></td> <td>LA</td> <td>Amygdala</td>		LEC	LEC		LA	Amygdala
IPHC LAH Subiculum RA Amygdala REC REC IA Amygdala LEC LEC #5 RAH CA3DG RPG RPHC LAH CA3DG LPG LPHC REC REC REC RA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala LPG LPHC REC REC RA Amygdala LEC LEC LPG LPHC REC REC RA Amygdala LEC LEC LPG LPHC REC REC RA CA3DG #18 LMH CA3DG REC REC HEC LEC LEC LAH CA3DG #18 LMH CA3DG REG REC HEC LEC LEC LAH CA3DG #16 CA3DG REC REG REC REC REC REC RPG RPHC		RPG	RPHC	#16	RAH	Subiculum
IAAnnygdalaRECRECIAAmygdalaLECLEC#5RAHCA3DGRPGRPHCRECRECRAAmygdalaLECLECLAAmygdalaRECRECRAAmygdalaRPGRPHC#17LMHSubiculumLPGLPHCRECRECRAAmygdalaLECLECLAAmygdalaRAAmygdala#7RAHCA3DG#18LMHCA3DG#18LMHCA3DGRPHCA1RECFusiform gyrusRECRECLECLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGRECRECRECRECLECLECLPGLPHCRAAmygdala#21RAAmygdalaH21RAHCA3DGRAAmygdalaRECREGRPHCLECLAAmygdalaLAAmygdalaLAAmygdalaLAAmygdalaRAAmygdalaLECLECHPGLPHCLECLECRAAmygdalaRAAmygdalaRAAmygdalaRAAmygdalaRAAmygdalaRAAmygdalaLECLECLAAmygdalaRPGRPHCLPGLPHCLA </td <td></td> <td>LPG</td> <td>LPHC</td> <td></td> <td></td> <td>Subiculum</td>		LPG	LPHC			Subiculum
#5 RAH CA3DG RPG RPHC #5 RAH CA3DG LPG LPHC REC REC RA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala LPG LPHC REC REC RA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala RA Amygdala #7 RAH CA3DG #18 LMH CA3DG #7 RAH CA3DG #18 LMH CA3DG #7 RAH CA3DG #18 LMH CA3DG REC REC HEC LEC LEC LEC LA Amygdala LEC LEC LEC LEC LPG LPHC #20 REC REC REC RA Amygdala HEC LEC LEC LEC LA Amygdala <td< td=""><td></td><td>KA LA</td><td>Amygdala</td><td></td><td>LEC</td><td>LEC</td></td<>		KA LA	Amygdala		LEC	LEC
 IAH CADG IAH CADG IAH CADG IPG IPG IPC REC REC REC RA Amygdala IEC IEC IEC IA Amygdala RPG RPHC #17 IAH Subiculum IPG IPHC REC REC REC RA Amygdala IEC IEC IEC IEC IEC IA Amygdala RA Amygdala RA Amygdala RA Amygdala RA Amygdala RA Amygdala RA Amygdala REC REC IEC IEC IEC IEC IEC IAH CA3DG #18 IAH CA3DG RPH CA1 REC Fusiform gyrus REC REC IEC IEC IEC IEC IEC IEC IEC #19, #25 RAH CA3DG RPG RPHC IAH CA3DG IPG IPHC #20 REC REC IEC IEC #21 RAH CA3DG IPG IPHC #20 REC REC IAA Amygdala #21 RAH CA3DG IAH CA3DG IAH CA3DG IAH CA3DG REC REC IAA Amygdala #21 RAH CA3DG IAH CA3DG REC REC IAA Amygdala #21 RAH CA3DG IAH CA3DG REC REC IAA Amygdala #21 RAH CA3DG IAH CA3DG REC REC IAA Amygdala REC REC IAA Amygdala REC REC IAA Amygdala IAH CA3DG IAA Amygdala IAH CA3DG IAA Amygdala REC REC REC IEC IEC IAA Amygdala IAA Amygdala REC REC IAA Amygdala REC REC	#5	RAH			RPG	RPHC
REC REC LEC LA Amygdala LEC LEC LA Amygdala RPG RPHC #17 LMH Subiculum LPG LPHC REC REC RA Amygdala LEC LEC LA Amygdala RA Amygdala LAH CA3DG LA Amygdala LAH CA3DG #18 LMH CA3DG RPH CA1 REC Fusiform gyrus REC REC LEC LEC LEC LEC LEC #19, #25 RAH CA3DG RPG RPHC LAH CA3DG LA Amygdala #21 RAH CA3DG LA Amygdala #21 RAH CA3DG LA Amygdala #21 RAH CA3DG RPG RPHC LAH CA3DG LAH CA3DG REC REC RA Amygdala #21 RAH CA3DG LAH CA3DG LAH CA3DG LAH CA3DG REC REC RA Amygdala #21 RAH CA3DG LAH CA3DG LAH CA3DG LAH CA3DG LAH CA3DG LAH CA3DG REC REC RPG RPHC LEC Subiculum LPG LPHC LEC Subiculum LPG LPHC LEC LEC REC RPG RPHC LEC Subiculum LPG LPHC LEC LEC REC RPG RPHC LEC Subiculum LPG LPHC LEC REC RPG RPHC LEC Subiculum LPG LPHC LEC LEC REC RPG RPHC LEC Subiculum LPG LPHC LEC Subiculum LPG LPHC LEC Subiculum LPG LPHC LEC Subiculum LPG LPHC LEC REC RPG RPHC LEC REC RPG RPHC LEC Subiculum LPG LPHC LEC Subiculum LPG LPHC LEC REC RA Amygdala REC REC REC REC LEC REC LA Amygdala REC REC LA Amygdala LEC LEC LEC LA Amygdala LEC LEC LEC LA Amygdala LEC Subiculum RPG RPHC LAH CA3DG RA Amygdala LEC Subiculum RPG RPHC LAH CA3DG RA Amygdala LEC LEC REC LA Amygdala LEC Subiculum RPG RPHC LAH CA3DG RA Amygdala LEC Subiculum	π.,	IAH	CA3DG		L PG	I PHC
LEC LEC LA Amygdala RPG RPHC #17 LMH Subiculum LPG LPHC REC REC RA Amygdala LEC LEC LA Amygdala RA Amygdala #7 RAH CA3DG LA Amygdala LAH CA3DG #18 LMH CA3DG RPH CA1 REC Fusiform gyrus REC REC LEC LEC LEC LEC LEC #19, #25 RAH CA3DG RPG RPHC LAH CA3DG RPG RPHC LAH CA3DG RA Amygdala #21 RAH CA3DG LA Amygdala #21 RAH CA3DG RA Amygdala #21 RAH CA3DG RFG RPHC LEC REC REC LA Amygdala #21 RAH CA3DG RPG RPHC LEC Subiculum LPG LPHC H20 REC REC RA Amygdala REC REC RPG RPHC LEC LEC LEC RPG RPHC LEC LEC REC RPG RPHC LEC Subiculum LPG LPHC LEC LEC REC RA Amygdala REC REC LA AMYGDALA RAA CA3DG RA AMYGDALA REC REC LA AMYGDALA REC REC REC REC LEC REC REC REC LA AMYGDALA REC REC REC		REC	REC		RA	Amvodala
RPGRPHC#17LMHSubiculumLPGLPHCRECRECRAAmygdalaLECLECLAAmygdalaRAAmygdala#7RAHCA3DG#18LMHCA3DGRPHCA1RECFusiform gyrusRECRECLECLECLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECLAAmygdalaLECLECLAAmygdalaRECRECRAAmygdalaLECLECLAAmygdala#21RAHCA3DG#8RAHCA3DGRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaRECREC#9RAHRAHLECLECLAAmygdalaRECRECHPGRPHCLAHCA3DGRPGRPHC#23RAHCA3DGRAAmygdalaRECLECLAAmygdalaLECLECLAAmygdalaRECRECLAAmygdalaRECRECRECRECRAAmygdalaRECRECRAAm		LEC	LEC		LA	Amygdala
LPGLPHCRECRECRAAmygdalaLECLECLAAmygdalaRAAmygdala#7RAHCA3DG#18LMHCA3DGRAHCA3DG#18LMHCA3DGRPHCA1RECFusiform gyrusRECRECLECLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaRECRECRAAmygdala#21RAHCA3DG#8RAHCA3DGRECRECLAAmygdala#22RMHCA3DGLAHCA3DGRECRECRECRPGRPHCLECLPHCLPHCLECLEC#22RMHCA3DGRAAmygdalaRECRECH9RAHRAHLECLECLAAmygdalaRECRECH9RAHRAHLECLECLAAmygdalaRECRECLPGLPHCLAHCA3DGRPGRPHC#23RAHCA3DGRPGRPHC#23RAHCA3DGRAAmygdalaRECRECRECLAAmygdalaRECRECLALECLECLAAmygdalaREC		RPG	RPHC	#17	LMH	Subiculum
RAAmygdalaLECLECLAAmygdalaRAAmygdala#7RAHCA3DG#18LMHCA3DGLAHCA3DG#18LMHCA3DGRPHCA1RECFusiform gyrusRECRECLECLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECRAAmygdalaLECLECLAAmygdala421RAHCA3DG#8RAHCA3DGLAHCA3DGLAHCA3DGRECRECRECRAAmygdala#21RAHCA3DGLAHCA3DGRECRECRECRAAmygdalaHECLECSubiculumLPGLPHCLPGLPHCLPGLPGLPHCLECSubiculumLPGLPHCLECRECRAAmygdalaRECREC#9RAHRAHLECLECLAAmygdalaRECRECLAAmygdalaRECRECLPGLPHCLAHCA3DGRPGRPHC#23RAHCA3DGRPGRPHC#23RAHCA3DGRPGRPHC#23RAHCA3DGRPGLPHC#23RAHCA3DGRPGLPHC#23RAHCA3DGRAAmygdalaRECREC		LPG	LPHC		REC	REC
LAAmygdalaRAAmygdala#7RAHCA3DGLAAmygdalaLAHCA3DG#18LMHCA3DGRPHCA1RECFusiform gyrusRECRECLECLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECRAAmygdalaLECLECLAAmygdala#21RAHCA3DG#8RAHCA3DGLECLECLAAmygdala#21RAHCA3DG#8RAHCA3DGRECRECRPGRPHCLECLPHCLPGLAHCA3DGRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DG#9RAHRAHLECLECLAAmygdalaRECRECHPGRPHC#23RAHCA3DGLECLECLAAmygdalaLECLECLAAmygdalaRPGRPHC#23RAHCA3DGRPGRPHC#23RAHCA3DGRPGLPHC#23RAHCA3DGLAAmygdalaRECRECLAAmygdalaRECRECLAAmygdalaRECRECLAAmygdalaLECSubiculumRAAmygdala <td></td> <td>RA</td> <td>Amygdala</td> <td></td> <td>LEC</td> <td>LEC</td>		RA	Amygdala		LEC	LEC
#7RAHCA3DGLAAmygdalaLAHCA3DG#18LMHCA3DGRPHCA1RECFusiform gyrusRECRECLECLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECRAAmygdalaLECLECLAAmygdala4ECLECLAAmygdala#21RAHCA3DG#8RAHCA3DGRECRECRPGRPHCLAHCA3DGLAHCA3DGRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLECSubiculumLPGLPHCLPGLPHCLAAmygdalaRECREC#9RAHRAHLECLECLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAHCA3DGRAAmygdalaRECRECLPGLPHCLAHCA3DGRAAmygdalaRECRECLAAmygdalaRECRECLAAmygdalaRECRECLAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumR		LA	Amygdala		RA	Amygdala
LAHCA3DG#18LMHCA3DGRPHCA1RECFusiform gyrusRECRECLECLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECRAAmygdalaLECLECLAHCA3DGRAHCA3DG#8RAHCA3DGLAHCA3DGLAHCA3DGRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLECLPHCLECLEC#22RMHCA3DGRAAmygdalaLECLPHCLECLEC#22RMHCA3DGRAAmygdalaRECREC#9RAHRAHLECLECLAHLAHCA3DGRECHPGLPHCLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaRAAmygdalaRECRECLPGLPHCLAHCA3DGRAAmygdalaRECRECLPGLPHCLAHCA3DGRAAmygdalaRECRECLAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumRPGRPHCRPGRPHCLEC<	#7	RAH	CA3DG		LA	Amygdala
RPHCA1RECFusitorm gyrusRECRECLECLECLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECRAAmygdalaLECLECLECLAAmygdala#21RAHCA3DG#8RAHCA3DGLAHCA3DGLAHCA3DGRECRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLMHCA3DGRAAmygdalaRECREC#9RAHRAHLECLECLAHLAHCA3DGRECREC#9RAHRAHLECLECLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLPGLPHCLAHCA3DGRAAmygdalaRECRECLAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumRPGRPHCRECLECLECLPGLPGLECLECLECLPGLPGLECLECLECHAHCA3DGRAAmygdalaRECRECRAAmygdalaRECRECRAAmygdalaREC<		LAH	CA3DG	#18	LMH	CA3DG
RECRECLECLECLECLECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECRAAmygdalaLECLECLECLAAmygdala#21RAHCA3DG#8RAHCA3DGLAHCA3DGLAHCA3DGRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLMHCA3DGRAAmygdalaRECREC#9RAHRAHLECLECLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLAAmygdalaRECRECH9RAHRAHCA3DGLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLAHCA3DGRAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumRPGRPHCRECLECLECLPGLPGLECLECLECHACA3DGRPGRPHCLECLPGLPGLECLECLECHANot in gray matter		RPH	CA1		REC	Fusiform gyrus
LECLEC#19, #25RAHCA3DGRPGRPHCLAHCA3DGLPGLPHC#20RECRECRAAmygdalaLECLECLAAmygdala#21RAHCA3DG#8RAHCA3DGLAHCA3DGLAHCA3DGLAHCA3DGLAHCA3DGRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLMHCA3DGLAAmygdalaRECREC#9RAHRAHLECLECLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLPGLPHCLAHCA3DGRAAmygdalaRAAmygdalaRECRECLAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumRPGRPHCRECLECLECLPGLPGLECLECRECREGRPGRPGRPHCLECLPGLPGLECLECLECLAHNot in gray matter		REC	REC	#40 #25	LEC	LEC
IndInficLAHCASDGLPGLPHC#20RECRECRAAmygdalaLECLECLAAmygdala#21RAHCA3DG#8RAHCA3DGLAHCA3DGLAHCA3DGRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLMHCA3DGLAAmygdalaRECREC#9RAHRAHLECLECLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLAAmygdalaRECRECLAHLAHCA3DGLPGLPHCLAHCA3DGLPGLPHCLAHCA3DGLPGLPHCLAHCA3DGRAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumRPGRPHCRECRECLPGLPGLPGLECLECH24RAHCA3DGRPGRPHCLECLPGLPGLECLECH24RAHCA3DGRAHSubiculumRPGRPHCRECRECLPGLPGLECLECLAHNot in gray matter		LEC		#19, #25	RAH	CA3DG
RAAmygdalaLECLECLAAmygdala#20IACILECLAAmygdala#21RAHCA3DG#8RAHCA3DGLAHCA3DGLAHCA3DGRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLMHCA3DGRAAmygdalaRECREC#9RAHRAHLECLECLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLAAmygdalaRECRECLAHLAHRAAmygdalaLECLPGLPHCLAHCA3DGRAHCA3DGLPGLPHCLAHCA3DGRAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumRPGRPHCRECRECLPGLPGLPGLECLECLEC#24RAHCA3DGRPGRPHCLECLAHNot in gray matter				#20		
LA Amygdala #21 RAH CA3DG #8 RAH CA3DG LAH CA3DG LAH CA3DG REC REC RPG RPHC LEC Subiculum LPG LPHC LPG LPHC LEC LEC #22 RMH CA3DG RA Amygdala LMH CA3DG LA Amygdala REC REC #9 RAH RAH LEC LEC LAH LAH RA Amygdala LEC LEC LEC LEC LEC LAH CA3DG RA Amygdala REC REC LAH CA3DG LA Amygdala REC REC LAH CA3DG LA Amygdala REC REC LAH CA3DG LEC LEC LEC LEC LAC RA Amygdala REC REC LAH CA3DG RA Amygdala REC REC LAH CA3DG RA Amygdala REC REC LA Amygdala REC REC LA Amygdala REC REC LA Amygdala REC REC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		RA	Amvadala	#20	LEC	LEC
 #8 RAH CA3DG LAH CA3DG LAH CA3DG LAH CA3DG LAH CA3DG LAH CA3DG REC REC REC REC RA Amygdala LMH CA3DG LA Amygdala LMH CA3DG LA Amygdala LMH CA3DG LA Amygdala LMH CA3DG LA Amygdala REC REC REC REC LA Amygdala REC REC LAH LAH LAH CA3DG LA Amygdala REC LEC LAH LAH CA3DG RA Amygdala REC REC REC REC REC REC REC LEC LPG LPG LPG LPG LPG LPG LPG RAH Subiculum RPG RPHC RPG RPHC LAH CA3DG RPG RPHC RPG RPHC LEC LPG LPG<td></td><td>IA</td><td>Amygdala</td><td>#21</td><td>RAH</td><td>CA3DG</td>		IA	Amygdala	#21	RAH	CA3DG
LAHCA3DGRECRECRPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLMHCA3DGLAAmygdalaRECRECLAAmygdalaRECLECLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLFGLPHCLAHCA3DGRAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumRPGRPHCRECRECLPGLPGLPGLECLEC#24RAHCA3DGRPGRPHCLAHNot in gray matter	#8	RAH	CA3DG		LAH	CA3DG
RPGRPHCLECSubiculumLPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLMHCA3DGLAAmygdalaRECRECLAAmygdalaRECLECLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLPGLPHCLAHCA3DGRAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumRPGRPHCRECRECLPGLPGLPGLECLEC#24RAHCA3DGRPGRPHCLAHNot in gray matter		LAH	CA3DG		REC	REC
LPGLPHCLPGLPHCLECLEC#22RMHCA3DGRAAmygdalaLMHCA3DGLAAmygdalaRECREC#9RAHRAHLECLECLAHLAHRAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLECLAAmygdalaLECLPHCLAHCA3DGLPGLPHCLAHCA3DGRAAmygdalaRECRECLAAmygdalaLECSubiculum#10RAHSubiculumRPGRPHCRECRECLPGLPGLPGLECLEC#24RAHCA3DGRPGRPHCLAHNot in gray matter		RPG	RPHC		LEC	Subiculum
LEC LEC #22 RMH CA3DG RA Amygdala LMH CA3DG LA Amygdala REC REC #9 RAH RAH LEC LEC LAH LAH RA Amygdala LEC LEC LA Amygdala LEC LEC LAH CA3DG LPG LPHC #23 RAH CA3DG LPG LPHC LAH CA3DG RA Amygdala REC REC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		LPG	LPHC		LPG	LPHC
RA Amygdala LMH CA3DG LA Amygdala REC REC #9 RAH RAH LEC LEC LAH LAH RA Amygdala LEC LEC LA Amygdala LEC LEC LA Amygdala RPG RPHC #23 RAH CA3DG LPG LPHC LAH CA3DG RA Amygdala REC REC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		LEC	LEC	#22	RMH	CA3DG
LA Amygdala REC REC #9 RAH RAH LEC LEC LAH LAH RA Amygdala LEC LEC LA Amygdala RPG RPHC #23 RAH CA3DG LPG LPHC LAH CA3DG RA Amygdala REC REC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		RA	Amygdala		LMH	CA3DG
#9 RAH RAH LEC LEC LAH LAH RA Amygdala LEC LA Amygdala LEC LA Amygdala RPG RPHC #23 RAH CA3DG LPG LPHC LAH CA3DG RA Amygdala REC REC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LPG LEC LEC #24 RAH CA3DG RFG RPHC LAH Not in gray matter		LA	Amygdala		REC	REC
LAH LAH RA Amygdala LEC LEC LA Amygdala RPG RPHC #23 RAH CA3DG LPG LPHC LAH CA3DG RA Amygdala REC REC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter	#9	RAH	RAH		LEC	LEC
LEC LA Amygdala RPG RPHC #23 RAH CA3DG LPG LPHC LAH CA3DG RA Amygdala REC REC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		LAH	LAH		RA	Amygdala
RPG RPHC #23 RAH CA3DG LPG LPHC LAH CA3DG RA Amygdala REC REC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		LEC	LEC	#22		Amygdala
Indicating Indicating Indicating RA Amygdala REC REC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		KPG		#23	KAH	
ICA Amygdala LEC NEC LA Amygdala LEC Subiculum #10 RAH Subiculum RPG RPHC REC REC LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		RV RV	Amvadala			REC
#10 RAH Subiculum RPG RPHC REC REC LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		IΔ	Amvadala		I FC	Subiculum
REC REC LPG LPG LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter	#10	RAH	Subiculum		RPG	RPHC
LEC LEC #24 RAH CA3DG RPG RPHC LAH Not in gray matter		REC	REC		LPG	LPG
RPG RPHC LAH Not in gray matter		LEC	LEC	#24	RAH	CA3DG
- /		RPG	RPHC		LAH	Not in gray matter

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Table S1. Cor	۱t
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Patient	Placement	Localization	Patient	Placement	Localization
	LPG	LPHC		REC	REC
	RA	Amygdala		LEC	LEC
	LA	Amygdala		RPG	RPHC
#11	RAH	CA3DG		LPG	LPHC
	LAH	CA3DG		LA	Amygdala
	REC	REC			
	LEC	Subiculum			
	RPG	RPHC			
	LPG	LPHC			
	RA	Amygdala			
	LA	Amygdala			

Region placements shown are right and left anterior, medial, or posterior hippocampus (RAH, LAH, RMH, LMH, RPH, LPH), right and left parahippocampal cortex (RPHC and LPHC), right and left entorhinal cortex (REC and LEC), and right and left amygdala (RA and LA). Electrodes from 22 of 25 subjects were further localized to the encompassing hippocampal subregions CA3 and dentate gyrus (CA3DG), CA1, or subiculum.

Table S2.	Demographics and	clinical characteristics	of low and high i	performers

	Age	Sex	WAIS VIQ	WAIS digit span	WMS verbal memory	CVLT verbal memory	Rey–Osterrieth visual nemory	Trails B executive
LP (mean)	31.75	7 (5)	90.1	27.17	18.17*	14.33*	9	29.2
SEM	3.23		4.27	9.05	4.16	5.96	7.67	10.08
HP (mean)	34.62	6 (5)	98.09	44.17	59.82*	53.82*	29.3	20.18
SEM	3.23		5.24	9.97	7.89	6.88	7.71	8.32

Shown are the average (bolded) and SE (SEM) of the ages and neuropsychological test scores in both groups. Under sex, is shown the number of male and female (in parentheses) participants within each group. Verbal IQ (VIQ) and digit span (attention) scores (percentiles shown) were calculated by using the Wechsler Adult Intelligence Scale (WAIS). Long-term verbal memory percentiles were calculated by using the Wechsler Memory Scale (WMS) and California Verbal Learning Test (CVLT) and executive function by means of the Trail Making Test. The asterisks (*) indicate significant differences between low performers (LP) and high performers (HP).

Table S3. No	umber of	recorded	l units
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Region	Multi-units	Single-units	Total units
Hippocampus	105	180	285
CA3DG	(62)	(117)	(179)
CA1	(9)	(7)	(16)
Subiculum	(34)	(56)	(90)
Entorhinal cortex	111	141	252
Parahippocampal cortex	88	138	226
Amygdala	176	237	413
Total	480	696	1,176

A total of 1,176 units were recorded from, with 285 in the hippocampus (179 in CA3 and dentate gyrus, 16 in CA1, and 90 in the subiculum), 252 in the entorhinal cortex, 226 in the parahippocampal cortex, and 413 in the amygdala. All performers (n = 40 sessions).

Table S4.	Number of units in hippocampal CA3DG and
subiculum	regions, entorhinal cortex, parahippocampal cortex,
and amygo	dala recorded from low performers

Region	Multi-units	Single-units	Total units
Hippocampus	47	82	129
CA3DG	(28)	(55)	(83)
CA1	(3)	(1)	(4)
Subiculum	(7)	(16)	(23)
Entorhinal cortex	50	83	133
Parahippocampal cortex	43	66	109
Amygdala	79	136	215
Total	204	343	586

Low performers (n = 20).

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Table S5.Number of units in hippocampal CA3DG andsubiculum regions, entorhinal cortex, parahippocampal cortex,and amygdala recorded from high performers

Region	Multi-units	Single-units	Total units
Hippocampus	58	98	156
CA3DG	(32)	(55)	(87)
CA1	(4)	(3)	(7)
Subiculum	(20)	(26)	(46)
Entorhinal cortex	61	58	119
Parahippocampal cortex	45	72	117
Amygdala	97	101	198
Total	251	298	590

High performers (n = 20).