Supporting Information

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SI Methods

Remember/Know. During a single session, participants first heard 25 words and made a shallow decision about each word (how many syllables the word contained). In the second stage, 50 new words were read out, and the subject made a deep decision about each word (rating the word as "pleasant" or "unpleasant" on a 6-point scale). This step was followed by another 25 words that required a shallow decision. Words were read out at a subject-paced rate of about 1 every 10 seconds. A recognition test was given immediately afterward in which subjects were read the 100 target words intermixed with 50 novel foils. Participants were asked to decide if the word was explicitly remembered (R), merely felt familiar (K), or was new. For the first 20 words and for several items spread throughout the test list, participants were required to explain why they made a particular response. None of the participants included seemed to have any difficulties understanding the instructions.

Structural Equation Modeling. Maximum likelihood estimation was used to obtain parameter values that best reproduced the observed covariance matrix. For all models, 2 residual terms were estimated for the observed variables; to facilitate model identification, 1 term was held constant across the 2 recall tests, and the other was held constant across the 2 recognition tests. For the 2-factor models, 6 factor loadings were estimated also (all 4 variables loaded on 1 factor and 2 variables loaded additionally on a second factor) for a total of 8 free parameters. For the single-factor model, 4 factor loadings (1 for each observed variable) were estimated for a total of 6 free parameters. Latent variable scores for recollection and familiarity factor scores were computed using the procedure described in Joreskog et al. [(2000) *LISREL 8: New Statistical Features* (Scientific Software International, Lincolnwood, IL)].

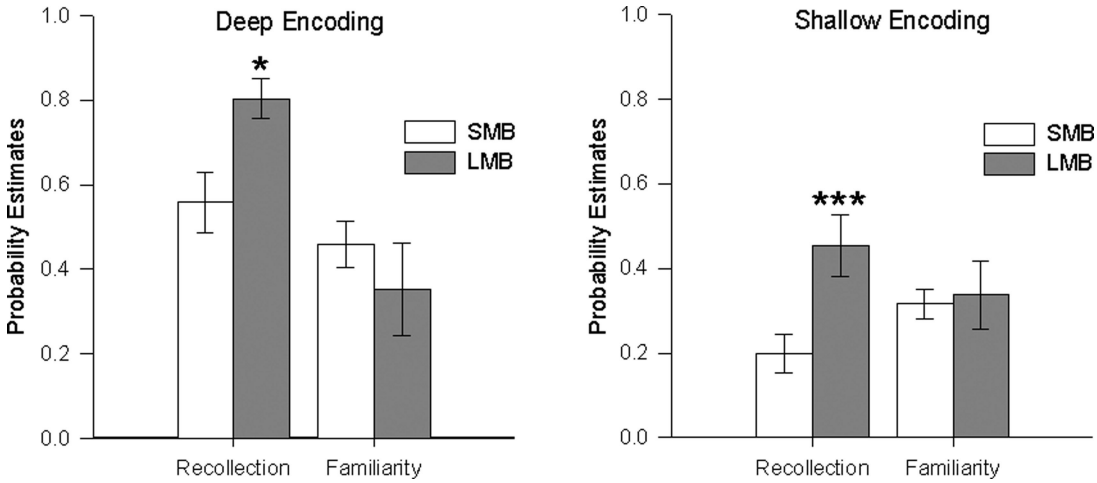

Fig. S1. Probability estimates of recollection and familiarity for ''deep encoding'' and ''shallow encoding'' components of the Remember/Know task. SMB, small mammillary body group; LMB, large mammillary body group; *, $P < 0.05$; ***, $P < 0.005$.

Table S1. Volumetric measurements: mean value per hemisphere (cm^3) ± standard errors; p-values for independent t-tests performed on the raw and intracranial-volume normalized (ICV) volumes

Area	Small Mammillary Body Group ($n = 9$)	Large Mammillary Body Group ($n = 9$)	P-value (raw)	P-value (ICV)
Mammillary bodies	0.015 ± 0.01	0.058 ± 0.008	<.001	<.001
Fornix	0.33 ± 0.10	0.39 ± 0.06	0.13	0.073
Hippocampus	2.47 ± 0.25	2.59 ± 0.31	0.37	0.38
Amygdala	1.69 ± 0.33	1.57 ± 0.10	0.32	0.48
Thalamus	4.66 ± 0.59	4.51 ± 0.66	0.62	0.82
Septum/diagonal band	0.36 ± 0.11	0.40 ± 0.10	0.40	0.39
Temporal pole	3.28 ± 0.67	3.04 ± 0.73	0.48	0.56
Perirhinal cortex	3.35 ± 0.48	3.72 ± 0.69	0.20	0.21
Entorhinal cortex	1.08 ± 0.23	0.88 ± 0.20	0.065	0.11
Parahippocampal cortex	1.53 ± 0.34	1.44 ± 0.31	0.57	0.68
Parahippocampal gyrus	3.63 ± 0.67	3.52 ± 0.80	0.77	0.96
Temporal lobe	78.19 ± 9.85	80.10 ± 6.85	0.640	0.495
Dorsolateral prefrontal cortex	21.33 ± 11.50	24.03 ± 7.08	0.558	0.624
Dorsomedial prefrontal cortex	25.74 ± 7.78	24.07 ± 6.78	0.63	0.70
Orbitolateral prefrontal cortex	5.86 ± 3.47	7.86 ± 3.80	0.26	0.25
Orbitomedial prefrontal cortex	7.32 ± 3.64	9.80 ± 3.52	0.16	0.14
Hemisphere	513.0 ± 22.07	515.4 ± 29.63	0.85	0.48
Lateral ventricle	22.28 ± 15.91	13.94 ± 5.43	0.16	0.17
Intracranial volume	1257.9 ± 108.35	1231.0 ± 87.48	0.57	N/A

Table S2. Correlations between patient characteristics and estimates of recollection and familiarity

Patient Characteristic	R/K ″R″ $n = 26$	R/K ″F″ $n = 26$	ROC ″R″ $n = 26$	ROC ″F″ $n = 26$	SEM ″R″ $n = 36$	SEM ″F″ $n = 36$
Time since surgery[a]	$r = -0.271$	$r = 0.049$	$r = -0.059$	$r = 0.061$	$r = -0.302$	$r = 0.072$
	$P = 0.181$	$P = 0.813$	$P = 0.774$	$P = 0.767$	$P = 0.073$	$P = 0.675$
Age[a]	$r = -0.161$	$r = -0.085$	$r = -0.139$	$r = -0.256$	$r = -0.343$	$r = -0.270$
	$P = 0.433$	$P = 0.681$	$P = 0.497$	$P = 0.206$	$P = 0.041$	$P = 0.111$
MB volume[b]	$r = 0.621$	$r = -0.070$	$r = 0.472$	$r = 0.347$	$r = 0.552$	$r = -0.143$
	$P = 0.001$	$P = 0.732$	$P = 0.015$	$P = 0.082$	$P < 0.001$	$P = 0.405$
MB volume (controlled for time since surgery and age)[c]	$r = 0.609$	$r = -0.112$	$r = 0.456$	$r = 0.300$	$r = 0.487$	$r = -0.236$
	$P = 0.002$	$P = 0.604$	$P = 0.025$	$P = 0.155$	$P = 0.003$	$P = 0.180$

[a]Pearson correlation coefficients and significance levels for correlations between derived estimates of recollection (″R″) and familiarity (″F″) [from Remember/Know (R/K), receiver operated characteristics (ROC) and structural equation modeling (SEM)] and time between surgery and first test (time since surgery) and age. These data show weak trends between time since surgery and recollection (for R/K and SEM) and between age and familiarity (SEM). There is a significant correlation between age and SEM-derived ″R.″

[b]Pearson correlation coefficients and significance levels for correlations between derived estimates of ″R″ and familiarity ″F″ and intracranial volume normalized mammillary body volumes (MB volume) that do not control for time since surgery and age.

[c]Correlation coefficients and significance levels for partial correlations between estimates of ″R″ and ″F″ and normalized MB volume that control for time since surgery and age.