Supplemental information online for

Sleep contributes to the strengthening of some memories over others, depending on hippocampal activity at learning.

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Coordinates of interest.

The directed forgetting paradigm is a multi-compound task involving a large range of cognitive processes during encoding and recognition. Consequently, locations of interest were defined on the basis of specific cognitive processes supposed to intervene during the encoding and retrieval phases respectively. The following a priori locations of interest were used for small volume corrections, based on published coordinates (or contralateral coordinates) in the literature for cognitive processes similar to that involved in our encoding and recognition tasks and/or on studies assessing the effect of sleep and sleep deprivation on memory.

Effect of the "Remember" or "Forget" instruction on encoding-related brain activity.

- Remember instruction

Left inferior prefrontal cortex [-48 26 9] and [-44 18 -7] (Reber et al., 2002) ; Anterior cingulate cortex [-6 21 33] (Reber et al., 2002) ; Medial superior frontal gyrus [-9 9 59] (Reber et al., 2002); Posterior hippocampus [-30 -33 -9] (Kuhl et al., 2010); Middle temporal gyrus [-26 35 16] (Wylie et al., 2008); Insula [30 7 16] (Wylie et al., 2008).

- Forget instruction

Superior medial frontal gyrus [-6 67 12] (Wylie et al., 2008); Middle frontal gyrus [-34 27 60] (Wylie et al., 2008); Middle cingulate gyrus [18 -33 40] (Wylie et al., 2008); Middle, superior temporal gyrus [58 -65 24] (Wylie et al., 2008); Middle temporal gyrus [66 -17 -

8] (Wylie et al., 2008); Parahippocampal gyrus [-14 -5 -20] and [18 -25 -20] (Wylie et al., 2008).

Encoding data : TBR-hits vs TBR-misses

Hippocampus [26 -16 -22] (Gais et al., 2007).

Recognition data: TBR-hits > TBR-misses

Superior frontal gyrus [-10 58 32] (Cansino et al., 2002); Middle frontal gyrus [36 50 8] (Spaniol et al., 2009); Inferior frontal gyrus [-44 42 0] (Spaniol et al., 2009); Anterior cingulated gyrus [-6 36 30] (Spaniol et al., 2009); Superior parietal lobule [-34 -60 44] (Spaniol et al., 2009); Amygdale [16 1 -21] (Cansino et al., 2002); Lingual gyrus [4 -74 -6] (Cansino et al., 2002); Precuneus [-6 -78 42] (Lundstrom et al., 2005); Cerebellum [-21 -60 -20] (Cansino et al., 2002) et [-22 -56 -26] (Gais et al., 2007); Supramarginal gyrus [48 -54 22] (Darsaud et al., 2011).

Recognition data: TBF-hits > TBF-misses

Medial frontal gyrus [-9 42 24] (Henson et al., 1999) ; Anterior cingulate gyrus [-3 21 39] (Henson et al., 2005) ; Cuneus/precuneus [15 -58 17] (Daselaar et al., 2006) ; Thalamus [-9 -12 6] (Montaldi et al., 2006).

Recognition data: common network for recognition of TBR-hits and TBF-hits (compared to Correct Rejections)

Inferior frontal gyrus [-32 20 -6] and [32 22 -14] (Spaniol et al., 2009); Caudate nucleus [10 10 -4] (Spaniol et al., 2009); Parahippocampal gyrus [-12 -36 4] (Spaniol et al., 2009); Hippocampus [26 -16 -22] (Gais et al., 2007) and [36 -20 -20] (Sterpenich et al., 2007).

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Supplementary Table 1: Brain areas associated, in both groups, to the encoding of TBR and TBF items, regardless of their status at retrieval.

		MNI coordinates (mm)				
Side	**Anatomical region**	**x**	**y**	**z**	**Z score**	**p value**
TBR > TBF						
Left	Putamen	-16	10	6	5.21	0.005*
Left	Thalamus	-4	-18	10	4.74	0.035*
Left	Precentral gyrus	-48	6	14	4.80	0.027*
Left	Middle frontal gyrus (BA 46)	-48	32	14	3.96	0.003**
Left	Inferior frontal gyrus (BA 44)	-48	16	12	3.84	0.004**
Left	Inferior frontal gyrus (BA 45)	-52	18	16	3.75	0.006**
Left	Superior frontal gyrus (BA 6)	-10	12	66	3.59	0.010**
Left	Posterior hippocampus	-26	-34	-8	3.4	0.017**
Left	Anterior cingulate cortex (BA 32)	-6	28	32	3.35	0.020**
Left	Inferior frontal gyrus (BA 47)	-54	18	-6	3.11	0.037**
TBF > TBR						
	No suprathreshold clusters					

Coordinates x, y, z (mm) are given in standard stereotactic MNI space. All regions listed are statistically at p FWE corrected <0.05 (*) and $p^{svc(10mm)}$ <0.05 (**) based on *a priori* coordinates from the literature (see Supplemental Information).

Supplementary Table 2: Brain areas that exhibited greater activity for the recognition of TBR items, compared to forgotten items (TBR-hits > TBR-misses).

	MNI coordinates				
Anatomical region	**x**	**y**	**z**	**Z score**	**p value**
RS > TSD (exclusive masking at p<0.05)					
Precentral gyrus	-44	6	44	4.89	0.013*
Putamen	14	6	-12	4.65	0.034*
Inferior frontal gyrus (BA 47)	-44	42	0	4.08	0.001**
Anterior cingulate gyrus	-12	36	26	4.02	0.002**
Superior parietal lobule (BA 7)	-28	-58	50	3.94	0.002**
Precuneus (BA 7)	-6	-72	42	3.56	0.008**
Lingual gyrus (BA 18)	-4	-86	-10	3.39	0.013**
Superior frontal gyrus (BA 10)	-26	60	6	2.39	0.017**
Cerebellum	-16	-52	-26	3.25	0.019**
Middle frontal gyrus (BA 10)	-34	56	4	2.98	0.038**
Amygdala	-20	-4	-20	2.92	0.044**
Superior frontal gyrus (BA 8)	-8	52	42	2.88	0.048**
TSD > RS (exclusive masking at p<0.05)					
No suprathreshold clusters					

Coordinates x, y, z (mm) are given in standard stereotactic MNI space. *: p FWE corrected <0.05; **: p<0.05 after correction for multiple comparisons on small volumes of interest reported in the literature (see Supplemental Information).

Supplementary Table 3: Brain activations associated to the recognition of TBF items, compared to forgotten items (TBF-hits > TBF-misses).

		MNI coordinates (mm)				
Side	**Anatomical region**	**x**	**y**	**z**	**Z score**	**p value**
RS > TSD						
Left	Superior temporal gyrus (pole)	-42	22	-18	4.69	0.030*
Left	Medial frontal gyrus (BA 9)	-12	34	32	3.62	0.007**
Left	Anterior cingulate gyrus (BA 32)	-4	26	36	2.94	0.043**
Left	Thalamus	-10	-12	16	2.92	0.046**
TSD > RS						
	No suprathreshold clusters.					

Coordinates x, y, z (mm) are given in standard stereotactic MNI space. All regions listed are statistically significant at the p FWE corrected <0.05 (*) and p svc(10mm) <0.05 (**) based on a priori coordinates from the literature (see Supplemental Information).

Supplementary Table 4: Common brain network activated during the recognition of TBR and TBF items ('TBR-hits - Correct Rejections' contrast masked by the 'TBF-hits - Correct Rejections' contrast (inclusive masking at p<0.001)) in RS and TSD groups.

			MNI coordinates (mm)				
	Side	**Anatomical region**	**x**	**y**	**z**	**Z score**	**p value**
RS group							
	Left	Putamen	-14	4	-12	5.85	<0.001*
	Left	Parahippocampal gyrus (BA 30)	-12	-38	-4	5.1	<0.001**
	Left	Anterior cingulate cortex (BA 24)	-4	32	20	5.63	0.001*
	Right	Anterior cingulate cortex (BA 24)	6	28	20	5.51	0.001*
	Left	Insula	-34	20	-2	5.55	0.001*
	Left	Inferior frontal gyrus (BA 47)	-34	22	-16	5.47	0.001*
	Right	Lenticular nucleus	10	4	-4	5.38	0.002*
	Right	Caudate nucleus	12	14	0	5.36	0.002*
	Right	Vermis	2	-60	-32	5.2	0.004*
	Left	Precuneus (BA 7)	-4	-74	44	5.13	0.005*
	Left	Lingual gyrus (BA 19)	-12	-38	-4	5.1	0.006*
	Right	Brainstem	10	-22	-14	5.03	0.008*
	Left	Calcarine region	-10	-94	-12	4.91	0.013*
	Right	Insula	40	16	-14	4.87	0.016*
	Right	Anterior cingulate cortex (BA 32)	14	44	2	4.75	0.025*
TSD group							
		No suprathreshold clusters					

Coordinates x, y, z (mm) are given in standard stereotactic MNI space. All regions listed are statistically significant at pFWE corrected <0.05 (*) and psvc(10mm) <0.05 (**) based on a priori coordinates from the literature (see Supplemental Information).