Figure S1. Distribution of voltage across electrodes for peaks and troughs, Related to Figure 3.

Prototypical voltage distributions across electrodes used to identify peaks/troughs in the averaged ERP (left column) and averaged voltage distributions for actual peaks and troughs as identified in the raw EEG (right column).
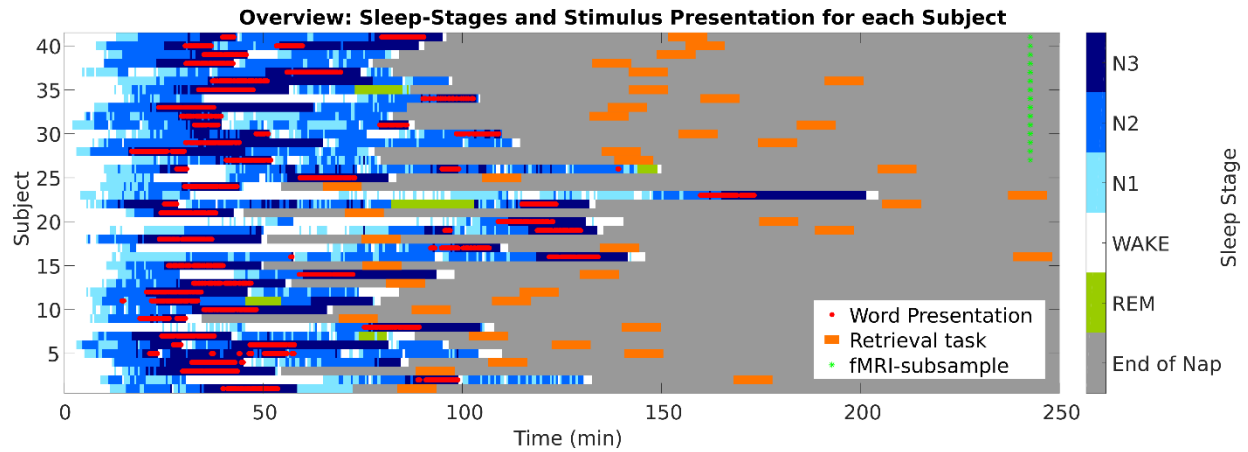
Figure S2. Overview of sleep stages and stimulus presentation, Related to Figure 1.

The time course of sleep stages, the time of stimulus presentation during sleep (red dots), and the time of post-sleep retrieval testing (orange bars) are illustrated for each subject. Time is indicated relative to the start of the afternoon nap. Only presentations of word pairs that survived stimulus exclusion criteria are displayed. Participants who underwent fMRI at testing are highlighted (green asterisk).

Stage	Mean (min)	SD (min)
Awake	23.22	20.15
N1	14.17	11.48
N2	29.29	16.80
N3	25.48	9.93
REM	1.32	4.11
Time in bed	93.48	33.06
Sleep onset latency	10.22	6.06
Total sleep time	70.26	26.04

Table S1. Mean time spent in each sleep stage (minutes) across all N = 41 participants, Related to Figure 1.

	N Troughs					
N Peaks	0	1	2	3	4	0-4
0	45.35%	51.67%	48.25%	52.08%	50.00%	49.46%
1	53.16%	53.56%	42.34%	33.33%		50.33%
2	59.48%	58.33%	54.29%			58.31%
3	60.38%	64.52%	50.00%			61.63%
4	57.14%					57.14%
0-4	54.20%	54.66%	46.37%	46.97%	50.00%	52.35%

Table S2. Memory performance (% correct decisions) for word pairs in which the second word was played into 0, 1, 2, 3 or 4 peaks and/or troughs (single-trial analysis across all participants), Related to Figure 4.

	N Troughs					
N Peaks	0	1	2	3	4	0-4
0	86	180	143	48	8	465
1	190	267	137	18		612
2	116	144	35			295
3	53	31	2			86
4	7					7
0-4	452	622	317	66	8	1465

Table S3. Number of word pairs in which the second word was played into 0, 1, 2, 3 or 4 peaks and/or troughs (single-trial analysis across all participants), Related to Figure 4.

N Peaks	N Troughs					0-4
	0	1	2	3	4	
0	45.35%	51.67%	48.25%	52.08%	50.00%	52.95%
1	53.16%	53.56%	42.34%	33.33%		51.40%
2	59.48%	58.33%	54.29%			53.70%
3	60.38%	64.52%	50.00%			55.36%
4	57.14%					0.00%
0-4	52.08%	50.63%	55.99%	54.55%	50.00%	52.35%

Table S4. Memory performance (% correct decisions) for word pairs in which the first word was played into 0, 1, 2, 3 or 4 peaks and/or troughs (single-trial analysis across all participants), Related to Figure 4.

N Peaks	N Troughs					0-4
	0	1	2	3	4	
0	118	218	149	36	4	525
1	185	273	132	19		609
2	113	129	28			270
3	36	20				56
4	5					5
0-4	457	640	309	55	4	1465

Table S5. Number of word pairs in which the first word was played into 0, 1, 2, 3 or 4 peaks and/or troughs (single-trial analysis across all participants), Related to Figure 4.

	Prototypical Voltage Distribution		Actual Voltage Distribution	
	Peak	Trough	Peak	Trough
Prototypical Voltage Distribution				
Peak		-0.981	0.948	-0.950
Trough	-0.981		-0.877	0.888
Actual Voltage Distribution				
Peak	0.948	-0.877		-0.996
Trough	-0.950	0.888	-0.996	

Table S6. Spearman correlation between prototypical voltage distributions (extracted from the analysis of slow-waves in the average event-related) and actual voltage distributions (obtained from discrete slow-waves in the raw EEG) of slow-wave peaks and troughs. All p < .001; Related to Figure 3.