

Supplemental Material

Cued memory reactivation during slow-wave sleep promotes explicit knowledge of a motor sequence

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		SRTT Improvement	
		Cued-sequence-improvement	Cued-sequence-specific-improvement
Cued-sequence-recall	Correlation	0.12	0.1
	Significance	p=0.67	p=0.72
Explicit-cueing-effect	Correlation	0.03*	0.005*
	Significance	p=0.92	p=0.99

Table 1: Pearson correlations between two explicit knowledge measures and improvement in SRTT performance for sequence trials alone, and SRTT improvement in sequence specific skill (random – sequence). *Spearman’s Rho correlation rather than Pearson’s, on account of the Explicit-cueing-effect not being normally distributed.

		SRTT Cueing Effects	
		Procedural-cueing-effect	Sequence-specific-cueing-effect
Cued-sequence-recall	Correlation	0.03	-0.24
	Significance	p=0.91	p=0.4
Explicit-cueing-effect	Correlation	0.09	-0.2
	Significance	p=0.75	p=0.47

Table 2: Pearson correlations to examine the relationship between explicit measures and SRTT cueing advantage measures (cued minus un-cued improvement), for sequence trials alone and sequence-specific-skill (random – sequence). *Spearman’s Rho correlation rather than Pearson’s’.

		Experimental-group		Control-group	
		Cued	Un-cued	Cued	Un-cued
SRTT Test Blocks					
Learning (Beginning)	Sequence	3.8 ± 0.7	3.9 ± 0.8	4.9 ± 0.8	5.5 ± 0.8
	Random				
Learning (Pre-sleep Test)	Sequence	7.4 ± 1.2	8.6 ± 1.2	7.3 ± 1.3	8.4 ± 1.5
	Random	10.8 ± 1.7	10.2 ± 1.6	9.7 ± 1.6	8.5 ± 1.3
	Difference	3.4 ± 1.2	1.5 ± 1.2	2.4 ± 1.0	0.1 ± 1.7
Retest	Sequence	7.1 ± 1.0	8.6 ± 1.4	7.6 ± 1.5	8.2 ± 1.4
	Random	8.4 ± 1.1	9.4 ± 1.2	9.3 ± 1.3	9.0 ± 1.4
	Difference	1.3 ± 1.0	0.8 ± 1.4	1.7 ± 1.3	0.8 ± 1.1
Improvement	Sequence	0.3 ± 1.3	0.0 ± 0.8	-0.3 ± 1.1	0.2 ± 1.0
	Random	2.4 ± 1.2	0.7 ± 1.3	0.4 ± 1.2	-0.6 ± 0.8
	Difference	-2.1 ± 0.9	-0.7 ± 0.8	-0.7 ± 1.7	0.8 ± 1.3

Table 3: Error rates as a percentage of trials across the experiment. With regard to Improvement scores in the final 3 rows, negative figures represent an increase in the number of errors made. Mean ± SEM.

		Frontal	Central	Parietal
CUE PERIOD				
Slow spindles	Correlation	-0.05	0.43	0.29
	Significance	p=0.86	p=0.17	p=0.44
Slow oscillation power	Correlation	0.11	-0.22	0.08
	Significance	p=0.8	p=0.51	p=0.83
NO-CUE PERIOD				
Slow spindles	Correlation	0.08	-0.14	-0.24
	Significance	p=0.79	p=0.66	p=0.53
Slow oscillation power	Correlation	0.32	0.04	0.05
	Significance	p=0.3	p=0.9	p=0.9

Table 4: All correlations performed between the procedural-cueing-effect (un-cued minus cued sequence RT improvement) and EEG features of slow spindle laterality and slow oscillation power.

		Frontal	Central	Parietal
Slow Oscillation Power				
CUE period	Correlation	0.11	-0.22	0.08
	Significance	p=0.7	p=0.51	p=0.83
NO-CUE period	Correlation	0.32	0.04	0.05
	Significance	p=0.3	p=0.9	p=0.9
Slow Spindles				
CUE period	Correlation	-0.05	0.43	0.29
	Significance	p=0.86	p=0.16	p=0.44
NO-CUE period	Correlation	0.08	0.14	-0.24
	Significance	p=0.79	p=0.66	p=0.53

Table 5: Correlations between the procedural-cueing-effect (un-cued minus cued sequence RT improvement) and slow oscillation power and slow spindles.

		Frontal	Central	Parietal
Slow Spindles				
CUE period	Correlation	0.03	0.2	-0.53
	Significance	p=0.9	p=0.55	p=0.18
NO-CUE period	Correlation	-0.32	0.01	-0.33
	Significance	p=0.35	p=0.99	p=0.42
Fast Spindles				
CUE period	Correlation	0.04	0.15	-0.43
	Significance	p=0.9	p=0.67	p=0.29
NO-CUE period	Correlation	0.1	0.13	-0.43
	Significance	p=0.74	p=0.7	p=0.3

Table 6: Correlations between the explicit-cueing-effect (un-cued minus cued sequence recall) and lateralisation of fast and slow spindles

Movie 1: Movie of the serial reaction time task

http://personalpages.manchester.ac.uk/staff/plewis/SRTT_video_small.mp4