

**SUPPLEMENTARY TABLES**

**Supplementary Table 1. Interaction between cognitive reserve proxies and slow wave sleep on cognition, adjusted for age and sex, in AHI+ (*n* = 95) and AHI- (*n* = 32).**

Interaction term	AHI+ ( <i>n</i> = 95)							
	Executive function				Episodic memory			
	Standardized $\beta$ coefficient (95% CI)	<i>p</i> value	R <sup>2</sup>	F-test	Standardized $\beta$ coefficient (95% CI)	<i>p</i> value	R <sup>2</sup>	F-test
SWS*Education	-0.09 (-0.27 0.1)	0.35	0.23	5.41	-0.08 (-0.26 0.1)	0.40	0.22	4.92
SWS*CAQ-Total	-0.17 (-0.36 0.02)	0.09	0.18	4.03	-0.16 (-0.35 0.02)	0.08	0.24	5.50
SWS*CAQ-Early	-0.13 (-0.34 0.08)	0.23	0.17	3.65	-0.16 (-0.36 0.05)	0.13	0.22	5.10
SWS*CAQ-Mid-life	-0.18 (-0.38 0.02)	0.08	0.15	3.21	-0.15 (-0.34 0.04)	0.11	0.23	5.20
SWS*CAQ-Late	-0.16 (-0.37 0.04)	0.12	0.20	4.47	-0.15 (-0.35 0.05)	0.13	0.23	5.44
SWS*LEQ-Total	-0.04 (-0.25 0.18)	0.72	0.16	3.33	-0.1 (-0.31 0.1)	0.31	0.23	5.27
SWS*LEQ-Young	0.02 (-0.2 0.24)	0.87	0.16	3.28	-0.03 (-0.24 0.18)	0.75	0.21	4.72
SWS*LEQ-Mid-life	-0.1 (-0.27 0.08)	0.27	0.15	3.09	-0.12 (-0.28 0.04)	0.14	0.23	5.22
SWS*LEQ-Late	0 (-0.2 0.2)	1.00	0.13	2.72	-0.07 (-0.25 0.12)	0.50	0.23	5.25

  

Interaction term	AHI- ( <i>n</i> = 32)							
	Executive function				Episodic memory			
	Standardized $\beta$ coefficient (95% CI)	<i>p</i> value	R <sup>2</sup>	F-test	Standardized $\beta$ coefficient (95% CI)	<i>p</i> value	R <sup>2</sup>	F-test
SWS*Education	-0.01 (-0.45 0.43)	0.97	0.21	1.40	-0.15 (-0.61 0.31)	0.52	0.22	1.50
SWS*CAQ-Total	-0.4 (-0.87 0.06)	0.09	0.27	1.89	-0.24 (-0.74 0.26)	0.33	0.26	1.79
SWS*CAQ-Early	-0.45 (-0.97 0.07)	0.09	0.25	1.77	-0.37 (-0.92 0.18)	0.18	0.26	1.78
SWS*CAQ-Mid-life	<b>-0.48 (-0.9 -0.06)</b>	<b>0.03</b>	<b>0.24</b>	<b>1.67</b>	-0.28 (-0.71 0.16)	0.20	0.26	1.84
SWS*CAQ-Late	-0.05 (-0.43 0.34)	0.81	0.25	1.69	0.03 (-0.38 0.44)	0.88	0.27	1.88
SWS*LEQ-Total	0.06 (-0.26 0.37)	0.72	0.55	6.25	-0.1 (-0.48 0.29)	0.61	0.37	3.06
SWS*LEQ-Young	-0.19 (-0.59 0.21)	0.35	0.36	2.91	-0.21 (-0.62 0.2)	0.31	0.39	3.39
SWS*LEQ-Mid-life	0.01 (-0.31 0.32)	0.96	0.41	3.67	-0.29 (-0.65 0.08)	0.12	0.29	2.08
SWS*LEQ-Late	-0.03 (-0.43 0.36)	0.86	0.34	2.68	0.11 (-0.28 0.5)	0.56	0.42	3.84

Results in bold were considered significant at *p* ≤ 0.05. Abbreviations: LEQ: Lifetime of Experiences Questionnaire; CAQ: Cognitive Activities Questionnaire; SWS: slow wave sleep; CR: cognitive reserve; CI: confidence interval; AHI: Apnea Hypopnea Index. Dichotomization between AHI+ and AHI- was based on the AHI clinical cutoff value of ≥15.

**Supplementary Table 2. Interaction between cognitive reserve proxies and slow wave sleep on cognition, adjusted for age and sex, excluding participants with CPAP treatment ( $n = 3$ ).**

Interaction term	Executive function				Episodic memory			
	Standardized $\beta$	$p$ value	$R^2$	F-test	Standardized $\beta$	$p$ value	$R^2$	F-test
	coefficient (95% CI)				coefficient (95% CI)			
SWS*Education	-0.06 (-0.22 0.1)	0.42	0.21	6.66	-0.07 (-0.24 0.09)	0.38	0.20	6.27
SWS*CAQ-Total	<b>-0.21 (-0.37 -0.04)</b>	<b>0.01</b>	<b>0.19</b>	<b>6.00</b>	<b>-0.22 (-0.38 -0.05)</b>	<b>0.01</b>	<b>0.24</b>	<b>7.76</b>
SWS*CAQ-Early	-0.16 (-0.34 0.02)	0.08	0.17	5.04	<b>-0.23 (-0.41 -0.04)</b>	<b>0.02</b>	<b>0.22</b>	<b>7.07</b>
SWS*CAQ-Mid-life	<b>-0.24 (-0.4 -0.07)</b>	<b>0.005</b>	<b>0.16</b>	<b>4.80</b>	<b>-0.21 (-0.37 -0.04)</b>	<b>0.01</b>	<b>0.23</b>	<b>7.44</b>
SWS*CAQ-Late	-0.13 (-0.3 0.03)	0.12	0.20	6.37	-0.15 (-0.32 0.02)	0.08	0.22	7.06
SWS*LEQ-Total	-0.01 (-0.19 0.16)	0.90	0.20	6.12	-0.11 (-0.29 0.06)	0.21	0.24	7.75
SWS*LEQ-Young	0.02 (-0.15 0.2)	0.79	0.17	5.19	-0.01 (-0.19 0.16)	0.88	0.22	6.91
SWS*LEQ-Mid-life	-0.1 (-0.24 0.04)	0.17	0.17	5.16	<b>-0.16 (-0.3 -0.01)</b>	<b>0.03</b>	<b>0.22</b>	<b>7.07</b>
SWS*LEQ-Late	0 (-0.18 0.17)	0.96	0.14	4.27	-0.07 (-0.23 0.1)	0.44	0.24	7.79

Results in bold were considered significant at  $p \leq 0.05$ . Abbreviations: LEQ: Lifetime of Experiences Questionnaire; CAQ: Cognitive Activities Questionnaire; SWS: slow wave sleep; CR: cognitive reserve; CI: confidence interval; CPAP: continuous positive airway pressure. The analysis was conducted in 132 participants.

**Supplementary Table 3. Interaction between cognitive reserve proxies and slow wave sleep on cognition, adjusted for age and sex, in participants with ( $n = 88$ ) and without ( $n = 47$ ) an adaptation night.**

Interaction term	Participants with an adaptation night ( $n = 88$ )							
	Executive function				Episodic memory			
	Standardized $\beta$	$p$ value	$R^2$	F-test	Standardized $\beta$	$p$ value	$R^2$	F-test
SWS*Education	-0.08 (-0.27 0.12)	0.43	0.26	5.81	-0.07 (-0.26 0.13)	0.50	0.22	4.57
SWS*CAQ-Total	-0.15 (-0.36 0.05)	0.14	0.19	3.86	<b>-0.22 (-0.41 -0.03)</b>	<b>0.02</b>	<b>0.26</b>	<b>5.88</b>
SWS*CAQ-Early	-0.08 (-0.32 0.16)	0.53	0.17	3.30	<b>-0.25 (-0.47 -0.03)</b>	<b>0.03</b>	<b>0.26</b>	<b>5.70</b>
SWS*CAQ-Mid-life	-0.16 (-0.37 0.05)	0.13	0.15	2.96	-0.19 (-0.38 0)	0.06	0.25	5.43
SWS*CAQ-Late	-0.12 (-0.33 0.08)	0.24	0.24	5.22	-0.18 (-0.38 0.02)	0.07	0.25	5.50
SWS*LEQ-Total	-0.01 (-0.22 0.2)	0.91	0.25	5.39	-0.14 (-0.34 0.06)	0.17	0.26	5.71
SWS*LEQ-Young	0.02 (-0.18 0.22)	0.84	0.21	4.49	-0.07 (-0.26 0.13)	0.51	0.23	4.83
SWS*LEQ-Mid-life	-0.1 (-0.26 0.07)	0.24	0.22	4.52	-0.13 (-0.29 0.03)	0.10	0.25	5.37
SWS*LEQ-Late	0 (-0.23 0.23)	0.98	0.17	3.39	-0.11 (-0.32 0.1)	0.31	0.27	6.17
Interaction term	Participants without adaptation night ( $n = 47$ )							
	Executive function				Episodic memory			
	Standardized $\beta$	$p$ value	$R^2$	F-test	Standardized $\beta$	$p$ value	$R^2$	F-test
SWS*Education	-0.21 (-0.58 0.16)	0.26	0.17	1.74	0.01 (-0.4 0.42)	0.94	0.23	2.45
SWS*CAQ-Total	<b>-0.47 (-0.81 -0.12)</b>	<b>0.01</b>	<b>0.28</b>	<b>3.23</b>	-0.2 (-0.61 0.21)	0.33	0.24	2.57
SWS*CAQ-Early	<b>-0.34 (-0.66 -0.03)</b>	<b>0.03</b>	<b>0.23</b>	<b>2.47</b>	-0.17 (-0.54 0.2)	0.35	0.19	1.98
SWS*CAQ-Mid-life	<b>-0.54 (-0.87 -0.21)</b>	<b>0.002</b>	<b>0.30</b>	<b>3.59</b>	-0.3 (-0.69 0.09)	0.12	0.25	2.70
SWS*CAQ-Late	-0.14 (-0.45 0.17)	0.35	0.16	1.58	-0.04 (-0.38 0.29)	0.80	0.24	2.62
SWS*LEQ-Total	-0.07 (-0.47 0.34)	0.75	0.15	1.46	0.07 (-0.36 0.49)	0.76	0.25	2.81
SWS*LEQ-Young	0.06 (-0.36 0.49)	0.76	0.12	1.11	0.28 (-0.15 0.71)	0.20	0.31	3.70
SWS*LEQ-Mid-life	-0.19 (-0.49 0.1)	0.20	0.18	1.74	-0.17 (-0.5 0.16)	0.30	0.21	2.14
SWS*LEQ-Late	0.13 (-0.21 0.46)	0.44	0.16	1.58	0.06 (-0.3 0.43)	0.73	0.22	2.33

Results in bold were considered significant at  $p \leq 0.05$ . Abbreviations: LEQ: Lifetime of Experiences Questionnaire; CAQ: Cognitive Activities Questionnaire; SWS: slow wave sleep; CR: cognitive reserve; CI: confidence interval; CPAP: continuous positive airway pressure.

**Supplementary Table 4. Interaction between cognitive reserve proxies and slow wave sleep on cognition, adjusted for age, in women (n = 83) and men (n = 52).**

Interaction term	Women (n = 83)							
	Executive function				Episodic memory			
	Standardized $\beta$ coefficient (95% CI)	p value	R <sup>2</sup>	F-test	Standardized $\beta$ coefficient (95% CI)	p value	R <sup>2</sup>	F-test
SWS*Education	-0.17 (-0.42 0.07)	0.15	0.23	5.84	-0.19 (-0.44 0.05)	0.12	0.14	3.12
SWS*CAQ-Total	<b>-0.29 (-0.53 -0.05)</b>	<b>0.02</b>	<b>0.25</b>	<b>6.41</b>	<b>-0.28 (-0.52 -0.04)</b>	<b>0.02</b>	<b>0.19</b>	<b>4.48</b>
SWS*CAQ-Early	-0.19 (-0.43 0.05)	0.11	0.22	5.47	<b>-0.29 (-0.53 -0.05)</b>	<b>0.02</b>	<b>0.16</b>	<b>3.85</b>
SWS*CAQ-Mid-life	<b>-0.36 (-0.61 -0.11)</b>	<b>0.005</b>	<b>0.21</b>	<b>5.17</b>	<b>-0.3 (-0.54 -0.06)</b>	<b>0.02</b>	<b>0.18</b>	<b>4.17</b>
SWS*CAQ-Late	-0.21 (-0.46 0.04)	0.10	0.26	6.88	-0.15 (-0.41 0.11)	0.25	0.16	3.65
SWS*LEQ-Total	-0.12 (-0.41 0.18)	0.43	0.22	5.61	-0.21 (-0.5 0.08)	0.15	0.19	4.70
SWS*LEQ-Young	-0.07 (-0.32 0.18)	0.59	0.21	5.14	-0.13 (-0.38 0.12)	0.31	0.14	3.17
SWS*LEQ-Mid-life	-0.18 (-0.38 0.02)	0.07	0.24	6.04	<b>-0.2 (-0.4 -0.01)</b>	<b>0.04</b>	<b>0.18</b>	<b>4.35</b>
SWS*LEQ-Late	-0.14 (-0.42 0.15)	0.35	0.14	3.18	-0.16 (-0.43 0.1)	0.22	0.20	4.88

  

Interaction term	Men (n = 52)							
	Executive function				Episodic memory			
	Standardized $\beta$ coefficient (95% CI)	p value	R <sup>2</sup>	F-test	Standardized $\beta$ coefficient (95% CI)	p value	R <sup>2</sup>	F-test
SWS*Education	0.09 (-0.15 0.34)	0.44	0.24	3.72	0.07 (-0.18 0.32)	0.57	0.06	0.77
SWS*CAQ-Total	-0.12 (-0.39 0.15)	0.37	0.11	1.43	-0.2 (-0.45 0.06)	0.12	0.09	1.10
SWS*CAQ-Early	-0.18 (-0.49 0.13)	0.25	0.10	1.28	-0.17 (-0.47 0.12)	0.24	0.07	0.83
SWS*CAQ-Mid-life	-0.08 (-0.36 0.2)	0.56	0.08	1.04	-0.16 (-0.42 0.09)	0.21	0.07	0.89
SWS*CAQ-Late	-0.05 (-0.33 0.24)	0.74	0.13	1.72	-0.24 (-0.51 0.03)	0.08	0.10	1.32
SWS*LEQ-Total	0.1 (-0.13 0.32)	0.40	0.19	2.83	-0.03 (-0.25 0.2)	0.83	0.06	0.71
SWS*LEQ-Young	0.13 (-0.13 0.39)	0.32	0.13	1.79	0.12 (-0.12 0.37)	0.31	0.10	1.33
SWS*LEQ-Mid-life	0.01 (-0.21 0.23)	0.92	0.12	1.64	-0.12 (-0.33 0.09)	0.24	0.07	0.84
SWS*LEQ-Late	0.21 (-0.01 0.42)	0.07	0.30	4.95	0 (-0.24 0.23)	0.98	0.05	0.67

Results in bold were considered significant at  $p \leq 0.05$ . Abbreviations: LEQ: Lifetime of Experiences Questionnaire; CAQ: Cognitive Activities Questionnaire; SWS: slow wave sleep; CR: cognitive reserve; CI: confidence interval.

**Supplementary Table 5. Interactions between cognitive reserve proxies and slow wave sleep on cognition adjusted for age and sex, without outliers (n = 5) derived from 3 standard deviations.**

Interaction term	Executive function				Episodic memory			
	Standardized $\beta$ coefficient (95% CI)	p value	R <sup>2</sup>	F value	Standardized $\beta$ coefficient (95% CI)	p value	R <sup>2</sup>	F value
	SWS*Education	-0.03 (-0.19 0.13)	0.74	0.18	5.57	-0.07 (-0.24 0.1)	0.40	0.23
SWS*CAQ-Total	<b>-0.19 (-0.36 -0.02)</b>	<b>0.03</b>	<b>0.17</b>	<b>5.10</b>	<b>-0.18 (-0.35 -0.01)</b>	<b>0.04</b>	<b>0.25</b>	<b>8.09</b>
SWS*CAQ-Early	-0.14 (-0.33 0.05)	0.15	0.14	4.02	-0.18 (-0.36 0.01)	0.07	0.23	7.39
SWS*CAQ-Mid-life	<b>-0.23 (-0.4 -0.06)</b>	<b>0.01</b>	<b>0.15</b>	<b>4.21</b>	<b>-0.18 (-0.34 -0.01)</b>	<b>0.04</b>	<b>0.24</b>	<b>7.85</b>
SWS*CAQ-Late	-0.11 (-0.28 0.05)	0.18	0.18	5.35	-0.13 (-0.29 0.04)	0.14	0.24	8.01
SWS*LEQ-Total	0.02 (-0.16 0.2)	0.80	0.19	5.68	-0.07 (-0.25 0.11)	0.43	0.25	8.13
SWS*LEQ-Young	0.08 (-0.1 0.26)	0.36	0.18	5.33	0 (-0.19 0.18)	0.98	0.23	7.56
SWS*LEQ-Mid-life	-0.09 (-0.26 0.08)	0.30	0.15	4.23	-0.15 (-0.32 0.02)	0.08	0.24	7.72
SWS*LEQ-Late	0.02 (-0.16 0.2)	0.81	0.13	3.77	-0.01 (-0.19 0.17)	0.92	0.25	8.32

Results in bold were considered significant at  $p \leq 0.05$ . Abbreviations: LEQ: Lifetime of Experiences Questionnaire; CAQ: Cognitive Activities Questionnaire; SWS: slow wave sleep; CR: cognitive reserve; CI: confidence interval. Results in orange are not significant anymore compare to the main table.