Heterogeneity in spontaneous sleep arousals: positive or negative links with early amyloid-beta and cognition

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Online supplementary materials

Contrast1		*Contrast2*		*Frequency band*					
				Theta		*Alpha*		*Beta*	
E	*T*	*E*	*T*	*t value*	*Adj p*	*t value*	*Adj p*	*t value*	*Adj p*
-	-	-	+	-1.03	0.73	-2.02	0.18	**-10.26**	**<.0001**
-	-	+	-	1.99	0.19	0.01	1.00	**-18.92**	**<.0001**
-	-	+	+	**4.08**	**0.0003**	-0.35	0.99	**-20.91**	**<.0001**
-	+	+	-	**3.30**	**0.006**	2.02	0.18	**-11.41**	**<.0001**
-	+	+	+	**5.11**	**<.0001**	1.39	0.51	**-12.73**	**<.0001**
+	-	+	+	**2.61**	**0.005**	-0.43	0.97	**-3.29**	**0.006**

Table S1. Post-hoc comparisons of the relative power for each arousal type within each frequency band. T: arousal associated (T+) or not (T-) with sleep stage transition; E: arousal associated (E+) or not (E-) with an increase in EMG tone. Indexes correspond to hourly prevalence. Significant associations are in bold.

	Age	***Sex***	***T-E-***	***T-E+***	***T+E-***	***T+E+***
Aβ burden	F = 11.98	F = 2.11	F = 0.00	F = 15.22	F = 3.22	F = 2.02
	p = 0.0008	p = 0.15	p = 0.99	p = 0.0002	p = 0.076	p = 0.16
	$R^2_{\beta*}$=0.11			$R^2_{\beta*}$=0.14		
	T-E+ T+E- contrast: t = -2.71, p = 0.008, adjusted =0.048, estimate = -2.87					

Table S2. Output of the GLMM with Aβ burden as dependent variable, and arousal types. All F tests had 1 (main effect) and 93 (error) degrees of freedom. Significant associations are in bold and are accompanied by their corresponding Semi-partial R^2 ($R^2\beta*$).

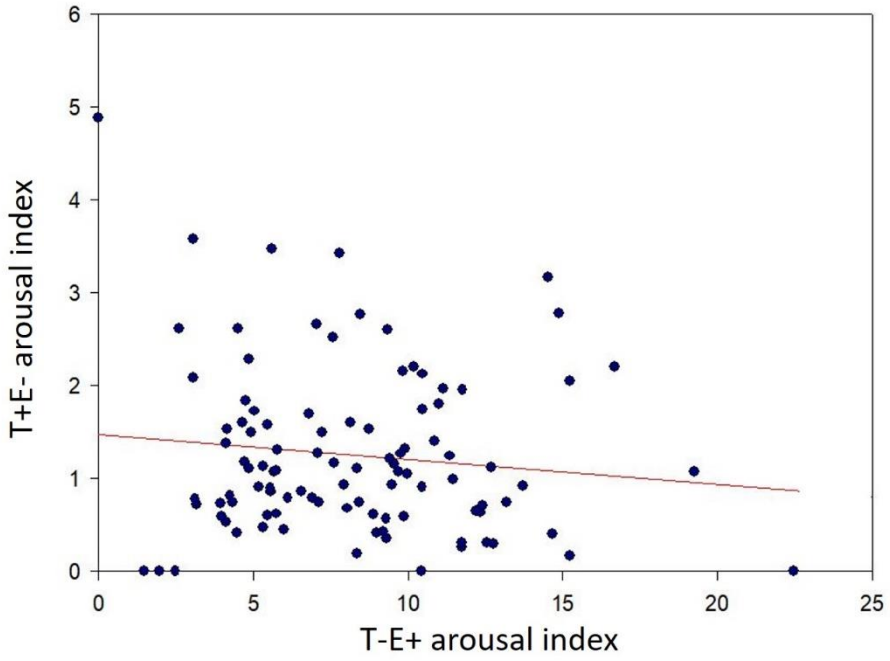

Fig. S1. Absence of significant correlation between T-E+ arousals and T+E- arousals (Pearson r=-.12 p=.24). T: arousal associated (T+) or not (T-) with sleep stage transition; E: arousal associated (E+) or not (E-) with an increase in EMG tone. Indexes correspond to hourly prevalence.

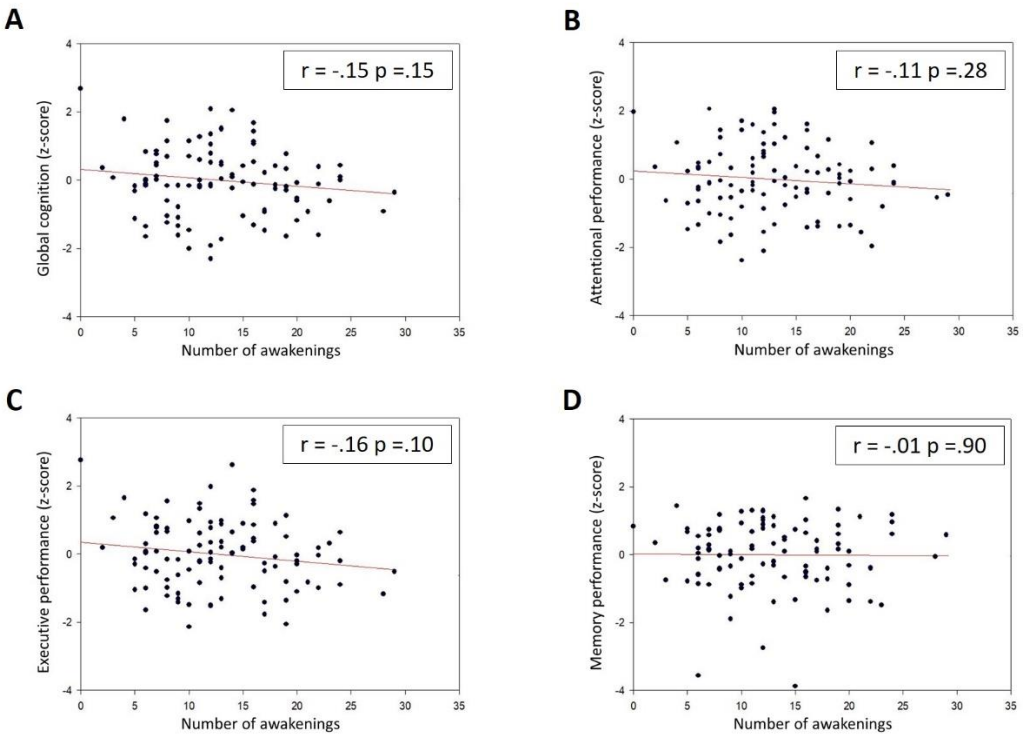

Fig. S2. Association between number of awakenings and cognition. (A) Global cognitive performance (Pearson r=-0.15, p=0.15; GLMM $F_{1,95}$=2.21, p=0.14); **(B)** attentional (Pearson r=-0.11, p=0.28; GLMM $F_{1,95}$=0.89 p=0.35); **(C)** executive (Pearson r=-0.16, p=0.10; GLMM $F_{1,95}$=3.53, p=0.06); **(D)** memory performances (Pearson r=-0.01, p=0.90; GLMM $F_{1,95}$=0.00, p=0.98). Inserts correspond to Pearson's r and associated p-values.

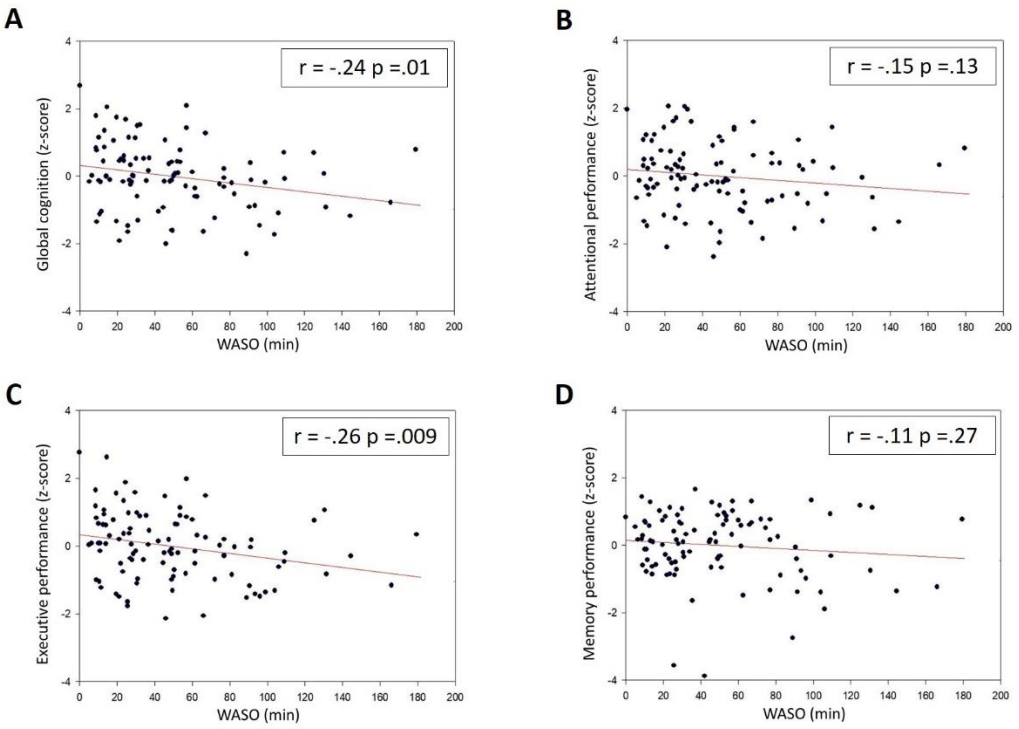

Fig. S3. Association between WASO and cognition. (A) Global cognitive performance (Pearson: r=-0.24, p=0.01; GLMM $F_{1,95}$=4.66, p=0.03); **(B)** attentional (Pearson: r=-0.15, p=0.13;GLMM: $F_{1,95}$=0.56, p=0.46); **(C)** executive (Pearson: r=-0.26, p=0.009;GLMM: $F_{1,95}$=7.58, p=0.007); **(D)** memory performances (Pearson: r=-0.11, p=0.27; GLMM: $F_{1,95}$=1.11 , p=0.30). Inserts correspond to Pearson's r and associated p-values.

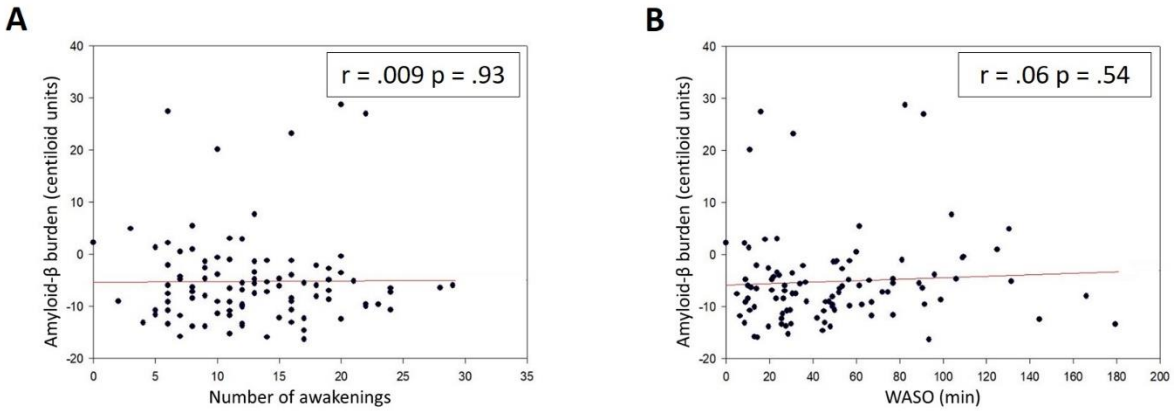

Fig. S4. Association between early cortical Aβ burden and sleep macrostructure fragmentation. (A) Association between number of awakenings and early cortical Aβ burden (Pearson: r=0.009, p=0.93; GLMM $F_{1,95}$=0.22, p=0.64); **(B)** association between WASO and early cortical Aβ burden (Pearson: r=0.06, p=0.54; GLMM $F_{1,95}$=0.05, p=0.83) (panel B). Inserts correspond to Pearson's r and associated p-values.