

**$\beta$ -amyloid pathology and hippocampal atrophy are independently associated with memory function in cognitively healthy elderly**

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### Supplementary information

	A $\beta$ negative, n (%)	A $\beta$ positive, n (%)
Cognitively unimpaired (n=325)	266 (82)	59 (18)
Subjective cognitive decline (n=204)	144 (71)	60 (29)
Mild cognitive impairment (n=276)	137 (50)	139 (50)
Dementia (n=84)	8 (10)	76 (90)

**Supplementary table 1. Proportion of A $\beta$  negative and positive subjects.** Number and proportion of A $\beta$  negative and positive subjects in the in the sample used for mixture modelling. Abbreviations: A $\beta$ , amyloid- $\beta$ .

Included variables	A $\beta$ pathology	HV	Temporal cx	Frontal cx	Adjusted R <sup>2</sup>
All variables included	<b>-0.14</b> (p=0.010)	<b>0.25</b> (p<0.001)	0.044 (p=0.72)	0.042 (p=0.71)	0.119
A $\beta$ , HV and temporal cx	<b>-0.14</b> (p=0.010)	<b>0.25</b> (p=0.001)	0.082 (p=0.22)	-	0.122
A $\beta$ , HV and frontal cx	<b>-0.14</b> (p=0.010)	<b>0.25</b> (p<0.001)	-	0.076 (p=0.22)	0.122
A $\beta$ and frontal and temporal cx	<b>-0.14</b> (p=0.015)	-	0.14 (p=0.25)	0.019 (p=0.87)	0.089
HV and frontal and temporal cx	-	<b>0.24</b> (p=0.001)	0.051 (p=0.68)	0.040 (p=0.72)	0.102
A $\beta$ and HV	<b>-0.14</b> (p=0.009)	<b>0.28</b> (p<0.001)	-	-	0.121
A $\beta$ and temporal cx	<b>-0.14</b> (p=0.014)	-	<b>0.16</b> (p=0.016)	-	0.092
A $\beta$ and frontal cx	<b>-0.14</b> (p=0.014)	-	-	<b>0.13</b> (p=0.033)	0.088
HV and temporal cx	-	<b>0.24</b> (p=0.001)	0.087 (p=0.20)	-	0.105
HV and frontal cx	-	<b>0.25</b> (p<0.001)	-	0.080 (p=0.21)	0.105
Temporal and frontal cx	-	-	0.15 (p=0.24)	0.018 (p=0.88)	0.073
A $\beta$	<b>-0.14</b> (p=0.013)	-	-	-	0.077
HV	-	<b>0.27</b> (p<0.001)	-	-	0.103
Temporal cx	-	-	<b>0.16</b> (p=0.014)	-	0.076
Frontal cx	-	-	-	<b>0.13</b> (p=0.031)	0.072

**Supplementary table 2. Multiple linear regressions.** Multivariable linear regression models, with ADAS-Cog delayed recall as dependent variable, including all or subsets of the different independent variables (A $\beta$ , HV, and temporal and frontal cortical thickness), controlling for age, sex, education, and ICV. Standardized beta coefficients with p values as well as adjusted R<sup>2</sup> values for each model are presented. Abbreviations: A $\beta$ , amyloid- $\beta$ ; HV, hippocampal volume; cx, cortex.

	All		Younger		Older	
	$\beta$	p	$\beta$	p	$\beta$	p
Age	-0.082	0.20	-0.037	0.64	0.071	0.43
Sex	0.12	0.090	<b>0.20</b>	<b>0.031</b>	0.047	0.66
Education	0.086	0.12	<b>0.22</b>	<b>0.004</b>	-0.033	0.68
Intracranial volume	<b>-0.19</b>	<b>0.014</b>	-0.16	0.098	<b>-0.24</b>	<b>0.046</b>
A $\beta$ positivity	<b>-0.14</b>	<b>0.009</b>	<b>-0.23</b>	<b>0.003</b>	-0.069	0.38
Hippocampal volume	<b>0.28</b>	<b>&lt;0.001</b>	0.16	0.066	<b>0.40</b>	<b>&lt;0.001</b>
R <sup>2</sup>	0.138		0.189		0.131	

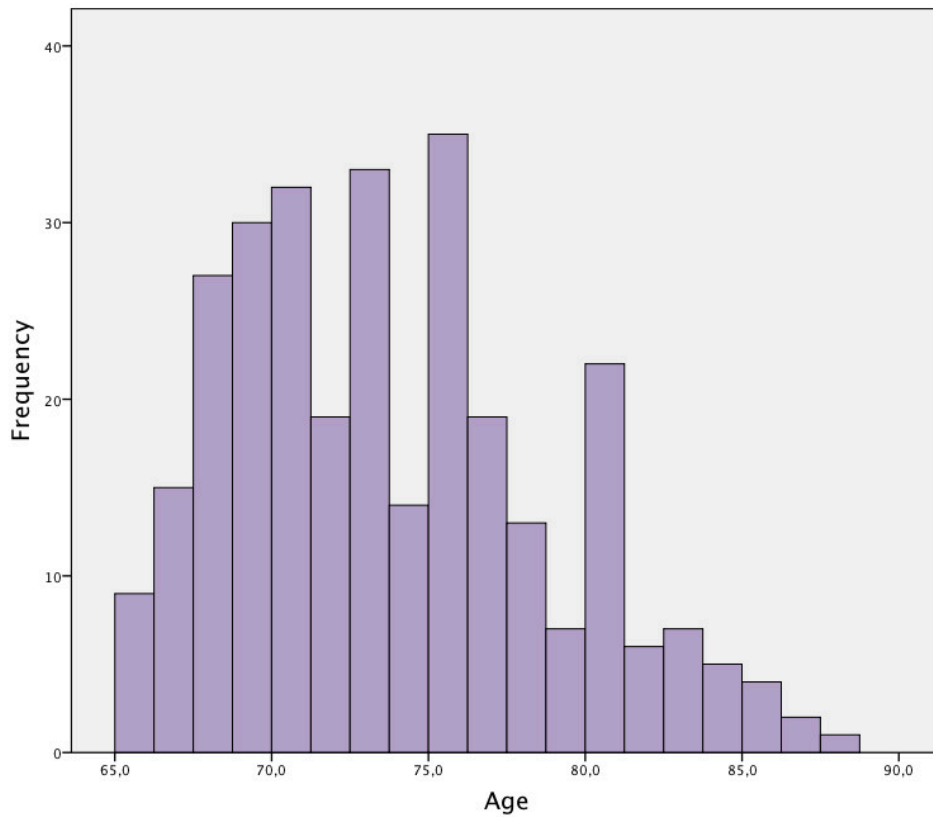
**Supplementary table 3. Age-dependent effects of amyloid pathology and hippocampal volume on memory function.** Multivariable linear regression models, with ADAS-Cog delayed recall as dependent variable. Standardized beta coefficients with p values as well as R<sup>2</sup> values for each model are presented. Results are presented for the entire group and the younger and older half, respectively. Abbreviations: A $\beta$ , amyloid- $\beta$ .

	$\beta$	p
Age	-0.052	0.50
Sex	<b>0.26</b>	<b>&lt;0.001</b>
Education	<b>0.22</b>	<b>0.004</b>
A $\beta$ positivity	-0.15	0.079
P-tau	<b>-0.17</b>	<b>0.045</b>
R <sup>2</sup>	0.184	

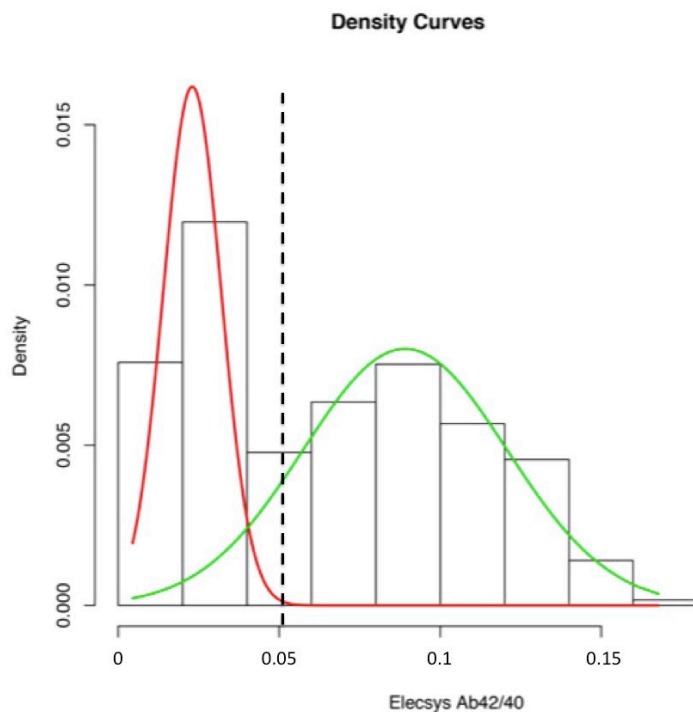
**Supplementary table 4. P-tau is associated with memory in the younger group.** Multivariable linear regression in only the younger half of the subjects (n=150), with ADAS-Cog delayed recall as dependent variable. Standardized beta coefficients with p values as well as the R<sup>2</sup> value for the whole model are presented. Abbreviations: A $\beta$ , amyloid- $\beta$ .

	$\beta$	p
Age	0.073	0.34
Sex	0.032	0.67
A $\beta$ positivity	<b>0.39</b>	<b>&lt;0.001</b>
R <sup>2</sup>	0.161	

**Supplementary table 5. A $\beta$  positivity is associated with higher p-tau in the younger group.** Multivariable linear regression in only the younger half of the subjects (n=150), with p-tau as dependent variable. Standardized beta coefficients with p values as well as the R<sup>2</sup> for the whole model are presented. Abbreviations: A $\beta$ , amyloid- $\beta$ .



**Supplementary Figure 1. Age distribution in the study sample.** Histogram displaying the age distribution in the study sample (n=300).



**Supplementary Figure 2. Distribution the Aβ42/40 ratio for defining the Aβ42/40 cutoff.** Histogram displaying the distribution of Aβ42/40 ratio in the sample used for the mixture modelling (n=889). Dashed line showing the calculated cut-off for the Aβ42/40 ratio.