

Table S1: Descriptive Statistics for Practice-Corrected and Scaled Memory and Executive Function Measures

Measure	N	Mean	SD	Range	Skewness	Kurtosis
<i>Episodic Memory</i>						
W1: Log Mem - Immediate	1023	0.12	0.96	-2.51, 3.34	0.03	-0.04
W2: Log Mem - Immediate	955	-0.23	0.96	-3.81, 2.58	-0.12	-0.10
W3: Log Mem - Immediate	838	-0.12	0.99	-3.81, 2.83	-0.22	0.12
W1: Log Mem - Delay	1022	0.12	0.94	-2.86, 3.16	-0.06	0.00
W2: Log Mem - Delay	955	-0.24	0.99	-3.01, 2.63	-0.14	-0.19
W3: Log Mem - Delay	838	-0.23	1.03	-3.01, 2.68	-0.13	-0.19
W1: Vis Repr - Immediate	1026	0.15	0.91	-3.16, 2.00	-0.42	-0.07
W2: Vis Repr - Immediate	955	0.00	0.94	-3.64, 1.92	-0.54	0.06
W3: Vis Repr - Immediate	833	-0.37	0.97	-6.17, 1.72	-0.77	1.56
W1: Vis Repr - Delay	1025	0.12	0.96	-2.81, 2.32	-0.15	-0.46
W2: Vis Repr - Delay	955	-0.07	0.95	-2.81, 2.10	-0.25	-0.30
W3: Vis Repr - Delay	833	-0.47	1.04	-2.81, 1.90	-0.11	-0.58
W1: CVLT - List Learning	1021	0.13	0.93	-2.56, 2.96	0.19	-0.23
W2: CVLT - List Learning	957	-0.06	0.99	-3.33, 3.24	0.07	-0.08
W3: CVLT - List Learning	837	-0.24	1.04	-5.02, 3.09	0.15	0.18
W1: CVLT - Short Delay	1021	0.12	0.95	-2.42, 2.68	0.17	-0.19
W2: CVLT - Short Delay	957	-0.05	1.00	-3.15, 2.54	0.06	-0.18
W3: CVLT - Short Delay	837	-0.19	1.04	-3.15, 2.56	0.02	-0.13
W1: CVLT - Long Delay	1021	0.14	0.92	-2.44, 2.40	0.17	-0.46
W2: CVLT - Long Delay	957	0.04	0.98	-3.13, 2.30	-0.04	-0.17
W3: CVLT - Long Delay	837	-0.19	1.06	-3.13, 2.40	-0.08	-0.19
<i>Executive Function</i>						
W1: Stroop	1016	0.04	0.96	-3.71, 3.45	-0.08	0.47
W2: Stroop	946	-0.54	1.04	-4.28, 6.67	-0.01	3.03
W3: Stroop	826	-1.12	1.04	-5.26, 2.98	-0.19	0.88
W1: Trail Making	1021	-0.09	0.86	-2.63, 5.11	1.18	3.70
W2: Trail Making	945	0.20	0.68	-2.20, 4.03	1.73	5.29
W3: Trail Making	834	0.42	0.67	-1.88, 3.89	1.22	3.43
W1: Category Switch	1024	0.04	0.98	-3.83, 2.82	-0.47	0.84
W2: Category Switch	954	-0.15	0.84	-3.46, 2.24	-0.62	1.00
W3: Category Switch	836	-0.24	0.84	-3.49, 1.74	-0.74	0.94
W1: LN Sequencing	1025	0.13	0.96	-2.58, 4.16	0.44	0.82
W2: LN Sequencing	956	-0.25	0.92	-3.17, 3.15	0.18	0.66
W3: LN Sequencing	838	-0.43	0.94	-3.96, 2.79	-0.06	0.75
W1: Reading Span	1003	0.12	0.95	-3.01, 2.03	-0.53	-0.01
W2: Reading Span	952	0.09	0.83	-2.73, 2.03	-0.32	-0.01
W3: Reading Span	830	-0.06	0.89	-3.10, 1.95	-0.36	-0.03
W1: Digit Span	1024	0.12	0.98	-2.33, 3.31	0.27	-0.30
W2: Digit Span	955	-0.22	0.92	-2.84, 3.05	0.29	-0.17
W3: Digit Span	838	-0.16	0.91	-3.64, 2.76	0.13	-0.12

Note: All measures were standardized with respect to the wave 1 data, including subjects with mild cognitive impairment at wave 1 who were excluded from these analyses (which is why

most wave 1 means are slightly above zero). All measures at subsequent waves were adjusted for practice effects utilizing data from attrition replacement subjects new to wave 2 or wave 3. Log Mem = Logical Memory; Vis Repr = Visual Reproductions; CVLT = California Verbal Learning Test; LN Sequencing = letter number sequencing; W1 = Wave 1; W2 = Wave 2; W3 = Wave 3.

Table S2: Parameter Estimates for the Models of AD-PRSs and Episodic Memory

	Full AD-PRS		AD-PRS + APOE			Full AD-PRS		AD-PRS + APOE	
	Est	SE	Est	SE		Est	SE	Est	SE
Factor Loadings (equated across waves)					AD-PRS associations with Memory Factors				
<i>Logical Memory</i>					Memory (Intercept)	0.035	0.020	0.015	0.020
Immediate	@1	NA	@1	NA	Memory (Slope)	-0.041	0.018	-0.010	0.015
Delay	1.128	0.026	1.127	0.026					
<i>Visual Reproductions</i>					Correlations between Memory Factors				
Immediate	@1	NA	@1	NA	Memory Intercept with Slope	0.023	0.009	0.023	0.009
Delay	1.188	0.048	1.190	0.048					
<i>California Verbal Learning Test</i>					Means				
Immediate	@1	NA	@1	NA	PC1	0.000	0.040	0.000	0.040
Delay	0.997	0.015	0.997	0.015	PC2	0.000	0.040	0.000	0.040
Learning Trials	0.910	0.018	0.909	0.018	PC3	0.000	0.040	0.000	0.040
<i>Episodic Memory</i>					APOE genotype	NA	NA	0.271	0.023
Logical Memory	@1	NA	@1	NA					
Visual Reproductions	0.862	0.077	0.861	0.077	Intercepts (fixed across wave for memory tasks/factors)				
CVLT (latent factor)	1.242	0.088	1.244	0.089	LM Immediate	@1	NA	@1	NA
Memory and AD-PRS on PCs & APOE genotype					LM Delay	-0.021	0.014	-0.021	0.014
<i>Memory (Intercept) on:</i>					VR Immediate	@1	NA	@1	NA
PC1	-0.010	0.019	-0.010	0.019	VR Delay	-0.044	0.022	-0.043	0.022
PC2	-0.003	0.021	-0.004	0.021	CVLT Immediate	@1	NA	@1	NA
PC3	-0.011	0.020	-0.010	0.020	CVLT Delay	0.036	0.012	0.036	0.012
APOE genotype	NA	NA	0.037	0.035	CLVT Learning	-0.018	0.017	-0.018	0.017
<i>Memory (Slope) on:</i>					AD-PRS	0.000	0.038	-0.016	0.042
PC1	-0.012	0.015	-0.011	0.015	Logical Memory factor	@1	NA	@1	NA
PC2	0.018	0.015	0.020	0.015	Visual Reproductions factor	0.002	0.031	0.002	0.031
PC3	-0.019	0.014	-0.020	0.014	CVLT factor	0.060	0.038	0.060	0.038
APOE genotype	NA	NA	-0.024	0.028	Memory (Intercept)	0.099	0.031	0.089	0.032
<i>AD-PRS on:</i>					Memory (Slope)	-0.347	0.022	-0.340	0.022
PC1	0.033	0.036	-0.001	0.039	Variances				

PC2	0.057	0.041	0.024	0.037	PC1	1.000	0.134	1.000	0.134
PC3	-0.017	0.038	-0.018	0.039	PC2	1.000	0.069	1.000	0.069
APOE genotype	NA	NA	0.059	0.059	PC3	1.000	0.083	1.000	0.083
					APOE Genotype	NA	NA	0.361	0.022

Residual Task Correlations

LM Immed: Wave 1 with Wave 2	0.048	0.012	0.048	0.012	Residual Variances				
LM Immed: Wave 1 with Wave 3	0.039	0.012	0.040	0.012	LM Immed: Wave 1	0.222	0.017	0.222	0.017
LM Immed: Wave 2 with Wave 3	0.043	0.013	0.042	0.013	LM Immed: Wave 2	0.212	0.020	0.212	0.020
LM Delay: Wave 1 with Wave 2	0.022	0.012	0.022	0.012	LM Immed: Wave 3	0.231	0.020	0.231	0.020
LM Delay: Wave 1 with Wave 3	0.029	0.013	0.028	0.013	LM Delay: Wave 1	0.055	0.019	0.055	0.019
LM Delay: Wave 2 with Wave 3	0.032	0.014	0.032	0.014	LM Delay: Wave 2	0.105	0.021	0.105	0.021
VR Immed: Wave 1 with Wave 2	0.180	0.024	0.181	0.024	LM Delay: Wave 3	0.079	0.021	0.079	0.021
VR Immed: Wave 1 with Wave 3	0.149	0.025	0.149	0.025	VR Immed: Wave 1	0.425	0.027	0.425	0.027
VR Immed: Wave 2 with Wave 3	0.186	0.026	0.186	0.026	VR Immed: Wave 2	0.496	0.033	0.496	0.032
VR Delay: Wave 1 with Wave 2	0.133	0.026	0.132	0.026	VR Immed: Wave 3	0.470	0.041	0.471	0.041
VR Delay: Wave 1 with Wave 3	0.136	0.026	0.136	0.025	VR Delay: Wave 1	0.366	0.034	0.366	0.034
VR Delay: Wave 2 with Wave 3	0.141	0.028	0.142	0.028	VR Delay: Wave 2	0.357	0.036	0.356	0.036
CVLT Immed: Wave 1 with Wave 2	0.038	0.011	0.038	0.011	VR Delay: Wave 3	0.434	0.039	0.432	0.039
CVLT Immed: Wave 1 with Wave 3	0.042	0.010	0.042	0.010	CVLT Immed: Wave 1	0.173	0.014	0.173	0.014
CVLT Immed: Wave 2 with Wave 3	0.023	0.011	0.023	0.011	CVLT Immed: Wave 2	0.189	0.014	0.189	0.014
CVLT Delay: Wave 1 with Wave 2	0.005	0.010	0.005	0.010	CVLT Immed: Wave 3	0.204	0.016	0.204	0.016
CVLT Delay: Wave 1 with Wave 3	-0.003	0.010	-0.003	0.010	CVLT Delay: Wave 1	0.162	0.012	0.162	0.012
CVLT Delay: Wave 2 with Wave 3	0.020	0.011	0.019	0.011	CVLT Delay: Wave 2	0.165	0.014	0.165	0.014
CVLT Learn: Wave 1 with Wave 2	0.096	0.013	0.096	0.013	CVLT Delay: Wave 3	0.204	0.025	0.204	0.025
CVLT Learn: Wave 1 with Wave 3	0.081	0.014	0.081	0.014	CVLT Learn: Wave 1	0.313	0.017	0.313	0.017
CVLT Learn: Wave 2 with Wave 3	0.097	0.014	0.097	0.014	CVLT Learn: Wave 2	0.320	0.019	0.320	0.019
PC1 with PC2	-0.001	0.040	-0.001	0.040	CVLT Learn: Wave 3	0.310	0.019	0.310	0.019
PC1 with PC3	-0.007	0.042	-0.007	0.042	AD-PRS	0.995	0.068	0.998	0.050
PC2 with PC3	-0.008	0.042	-0.008	0.042	LM (fixed across waves)	0.426	0.023	0.426	0.023
PC1 with APOE genotype	NA	NA	0.024	0.021	VR (fixed across waves)	0.221	0.019	0.221	0.018
PC2 with APOE genotype	NA	NA	0.007	0.022	CVLT (fixed across waves)	0.368	0.025	0.367	0.025
PC3 with APOE genotype	NA	NA	0.003	0.020	Memory LV (fixed across waves)	0.033	0.008	0.032	0.008
					Memory (Intercept)	0.243	0.031	0.241	0.031
					Memory (Slope)	0.046	0.015	0.045	0.015

Note: Unstandardized model estimates are displayed here. The first two columns display the estimates (Est) and standard errors (SE) for Model 1 (i.e., full AD-PRSs including *APOE*-region SNPs) and the final two columns display the estimates and standard errors for Model 2 (i.e., AD-PRSs exclude *APOE*-region SNPs and *APOE* genotype is added as a covariate). @ = factor loading fixed to 1 or 0; LM=Logical Memory; VR=Visual Reproductions; CVLT=California Verbal Learning Test; PC=Principal component.

Table S3: Parameter Estimates for the Models of AD-PRSs and Executive Function

	Full AD-PRS		AD-PRS + APOE			Full AD-PRS		AD-PRS + APOE	
	Est	SE	Est	SE		Est	SE	Est	SE
Factor Loadings (equated across waves)					AD-PRS associations with EF Factors				
<i>Common EF</i>					Common EF (Intercept)	0.044	0.021	0.036	0.023
Stroop	@1	NA	@1	NA	Common EF (Slope)	-0.074	0.024	-0.015	0.021
Trails	0.480	0.025	0.480	0.025	WM-Specific (Intercept)	0.028	0.019	0.010	0.020
Category Switch	0.287	0.028	0.286	0.028					
Letter Number Sequencing	0.522	0.033	0.522	0.034	Correlations between EF Factors				
Reading Span	0.214	0.027	0.214	0.027	EF Intercept with EF Slope	-0.019	0.027	-0.017	0.027
Digit Span	0.264	0.025	0.262	0.025	EF Intercept with WM Intercept	0.100	0.015	0.099	0.015
<i>Working Memory-Specific</i>					EF Slope with WM Intercept	-0.013	0.014	-0.011	0.014
Letter Number Sequencing	@1	NA	@1	NA					
Reading Span	1.040	0.072	1.038	0.072	Means				
Digit Span	1.423	0.087	1.425	0.088	PC1	0.000	0.040	0.000	0.040
					PC2	0.000	0.040	0.000	0.040
					PC3	0.000	0.040	0.000	0.040
EF Factors and AD-PRS on PCs & APOE genotype					APOE genotype	NA	NA	0.271	0.023
<i>Common EF (Intercept) on:</i>									
PC1	-0.003	0.022	-0.010	0.022	Intercepts (fixed across wave for EF tasks)				
PC2	0.000	0.025	-0.001	0.025	Stroop	@0	NA	@0	NA
PC3	0.014	0.023	0.016	0.023	Trails	0.080	0.020	0.080	0.020
APOE genotype	NA	NA	0.066	0.037	Category Switch	0.037	0.025	0.036	0.025
<i>Common EF (Slope) on:</i>					Letter Number Sequencing	@0	NA	@0	NA
PC1	-0.013	0.020	-0.010	0.020	Reading Span	0.068	0.037	0.069	0.037
PC2	0.033	0.024	0.035	0.024	Digit Span	-0.076	0.039	-0.077	0.039
PC3	-0.038	0.022	-0.039	0.022	AD-PRS	0.000	0.038	-0.016	0.042
APOE genotype	NA	NA	-0.098	0.040	Common EF (Intercept)	-0.001	0.026	-0.017	0.028
<i>WM-Specific (Intercept) on:</i>					Common EF (Slope)	-0.935	0.026	-0.910	0.029
PC1	-0.039	0.019	-0.040	0.019	WM-Specific (Intercept)	0.093	0.033	0.081	0.034
PC2	0.021	0.021	0.020	0.021					
PC3	0.004	0.020	0.004	0.020	Variances				
APOE genotype	NA	NA	0.042	0.031	PC1	1.000	0.134	1.000	0.134
<i>AD-PRS on:</i>									

PC1	0.033	0.036	-0.001	0.039	PC2	1.000	0.069	1.000	0.069
PC2	0.057	0.041	0.024	0.037	PC3	1.000	0.083	1.000	0.083
PC3	-0.017	0.038	-0.018	0.039	APOE Genotype	NA	NA	0.361	0.022
APOE genotype	NA	NA	0.059	0.059					

Residual Task Correlations

Stroop: Wave 1 with Wave 2	0.303	0.039	0.305	0.039
Stroop: Wave 1 with Wave 3	0.400	0.045	0.402	0.045
Stroop: Wave 2 with Wave 3	0.333	0.046	0.334	0.046
Trail: Wave 1 with Wave 2	0.068	0.027	0.068	0.027
Trail: Wave 1 with Wave 3	0.094	0.024	0.093	0.024
Trail: Wave 2 with Wave 3	0.059	0.019	0.059	0.018
Cat Switch: Wave 1 with Wave 2	0.210	0.033	0.210	0.033
Cat Switch: Wave 1 with Wave 3	0.146	0.035	0.146	0.035
Cat Switch: Wave 2 with Wave 3	0.205	0.029	0.205	0.029
LN Seq: Wave 1 with Wave 2	0.115	0.024	0.115	0.024
LN Seq: Wave 1 with Wave 3	0.094	0.024	0.094	0.024
LN Seq: Wave 2 with Wave 3	0.102	0.026	0.102	0.026
Read Span: Wave 1 with Wave 2	0.202	0.024	0.203	0.024
Read Span: Wave 1 with Wave 3	0.210	0.029	0.211	0.029
Read Span: Wave 2 with Wave 3	0.261	0.022	0.262	0.022
Digit Span: Wave 1 with Wave 2	0.113	0.026	0.112	0.026
Digit Span: Wave 1 with Wave 3	0.112	0.026	0.111	0.026
Digit Span: Wave 2 with Wave 3	0.102	0.025	0.110	0.025
PC1 with PC2	-0.001	0.040	-0.001	0.040
PC1 with PC3	-0.007	0.042	-0.007	0.042
PC2 with PC3	-0.008	0.042	-0.008	0.042
PC1 with APOE genotype	NA	NA	0.024	0.021
PC2 with APOE genotype	NA	NA	0.007	0.022
PC3 with APOE genotype	NA	NA	0.003	0.020

Residual Variances

Stroop: Wave 1	0.783	0.058	0.784	0.058
Stroop: Wave 2	0.926	0.076	0.928	0.076
Stroop: Wave 3	0.893	0.065	0.894	0.065
Trail: Wave 1	0.687	0.058	0.687	0.058
Trail: Wave 2	0.407	0.040	0.407	0.040
Trail: Wave 3	0.389	0.034	0.388	0.034
Cat Switch: Wave 1	0.931	0.050	0.931	0.050
Cat Switch: Wave 2	0.684	0.040	0.684	0.040
Cat Switch: Wave 3	0.686	0.044	0.685	0.044
LN Seq: Wave 1	0.490	0.033	0.490	0.033
LN Seq: Wave 2	0.507	0.032	0.507	0.032
LN Seq: Wave 3	0.506	0.035	0.506	0.035
Reading Span: Wave 1	0.605	0.037	0.606	0.037
Reading Span: Wave 2	0.401	0.024	0.402	0.024
Reading Span: Wave 3	0.475	0.028	0.475	0.028
Digit Span: Wave 1	0.334	0.030	0.333	0.030
Digit Span: Wave 2	0.328	0.028	0.333	0.028
Digit Span: Wave 3	0.300	0.030	0.299	0.030
AD-PRS	0.995	0.068	0.998	0.050
Common EF (fixed across waves)	0.010	0.016	0.010	0.016
WM-Specific (fixed across waves)	0.009	0.004	0.009	0.004
Common EF (Intercept)	0.171	0.034	0.170	0.034
Common EF (Slope)	0.074	0.036	0.071	0.036
WM-Specific (Intercept)	0.228	0.025	0.228	0.025

Note: Unstandardized model estimates are displayed here. The first two columns display the estimates and standard errors for Model 1 (i.e., full AD-PRSs including *APOE*-region SNPs) and the final two columns display the estimates and standard errors for Model 2 (i.e., AD-PRSs exclude *APOE*-region SNPs and *APOE* genotype is added as a covariate). @=factor loading fixed to 1 or 0; EF=Executive function; WM=Working memory; PC=Principal component; LN Seq=Letter number sequencing.

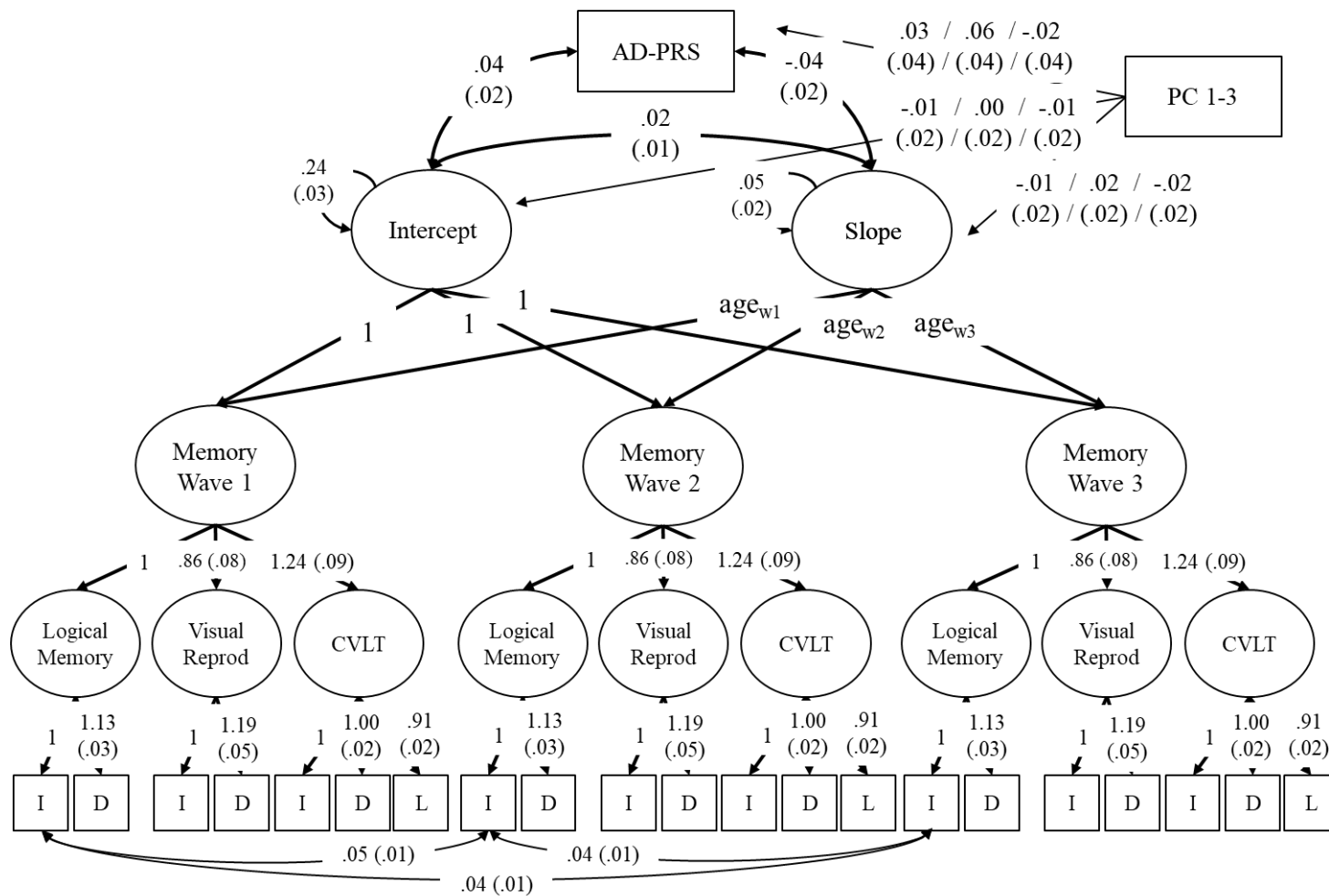


Figure S1: Latent growth model of episodic memory and AD-PRS (unstandardized estimates, SE in parentheses). Factor loadings of “1” were fixed to 1. Factor loadings on the slope factor represent each individual’s age at that assessment (centered on the mean age at wave 1 and scaled based in decades). The three numbers on the paths from principal components (PCs) to the AD-PRS, Intercept, and Slope factors represent regression paths on the first (left), second (middle), and third (right) principal components (they are shown on a single path for simplicity, but were estimated separately). Residual correlations among all tasks were estimated, but are only shown for the logical memory (immediate recall) task for simplicity. CVLT = California Verbal Learning Task; I = immediate recall; D = delayed recall; L = learning trials. Model Fit: -2LL = -27398.21, AIC = 54966.42, BIC = 55396.78.

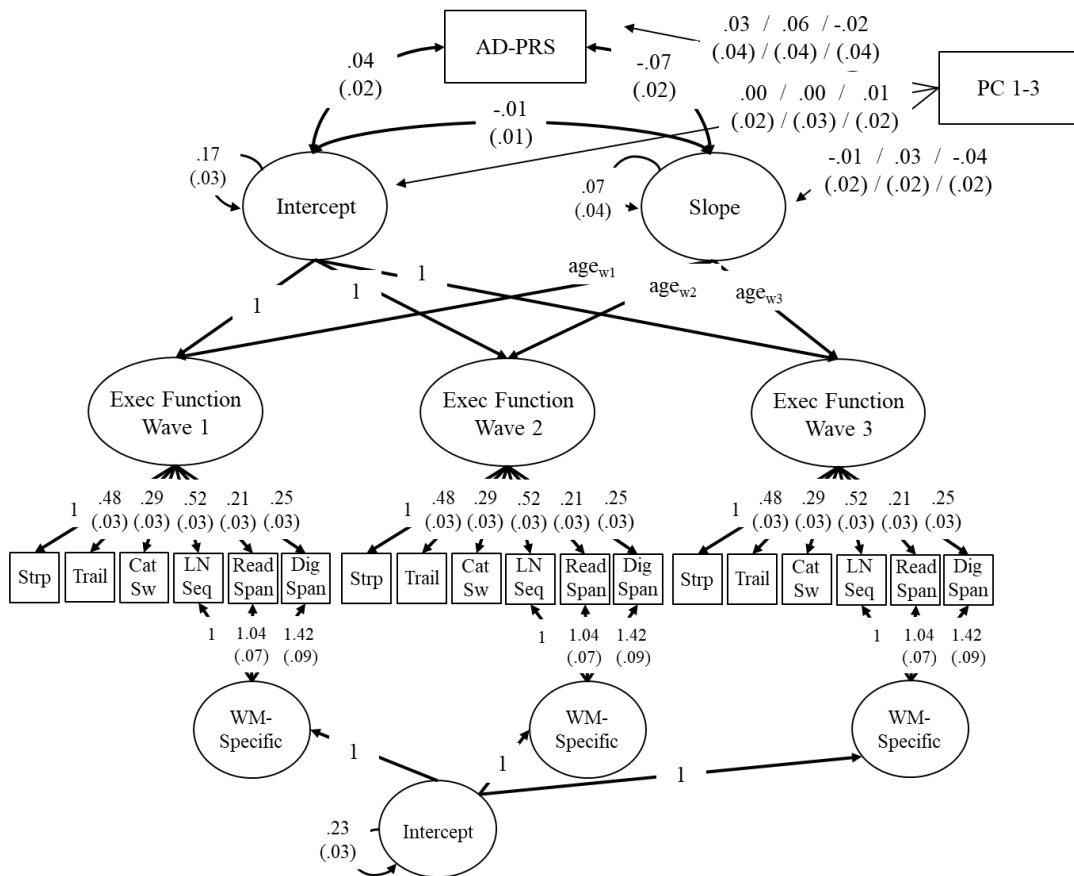


Figure S2: Latent growth model executive function and AD-PRS (unstandardized estimates, SE in parentheses). Factor loadings of “1” were fixed to 1. Factor loadings on the slope factor represent each individual’s age at that assessment (centered on the mean age at wave 1 and scaled based in decades). The three numbers on the paths from principal components (PCs) to the AD-PRS, Intercept, and Slope factors represent regression paths on the first (left), second (middle), and third (right) principal components (they are shown on a single path for simplicity, but were estimated separately). Residual correlations among all executive function tasks were estimated, but are only shown for the Stroop task for simplicity. Not displayed are residual correlations among individual tasks (e.g., Stroop wave 1 to wave 2), correlations between the WM intercept and EF intercept/slope factors (and AD-PRS), or regressions from WM intercept on the principal components (PCs). Strp = Stroop; Trail = Trail Making Test; Cat Sw = Category switching fluency; LN sq = Letter number sequencing; Read Span = Reading span; Dig Span = Digit Span; WM-Specific = working memory-specific. Model Fit: -2LL = -26073.03, AIC = 52314.05, BIC = 52472.54.