

Table S1 Standardized estimates

Name	Estimate	CI	SE	Type
cog_perf_to_mmse	0.72	(0.68, 0.76)	0.02	Factor loadings
cog_perf_to_verbal_fluency	0.52	(0.48, 0.56)	0.02	Factor loadings
cog_perf_with_cog_perf	0.55	(0.49, 0.61)	0.03	Factor variances
age_with_age_last_education	-0.34	(-0.38, -0.31)	0.02	Manifest covs
age_with_hadsd	0.16	(0.13, 0.2)	0.02	Manifest covs
age_with_depression_requiring_treatment	-0.11	(-0.17, -0.05)	0.03	Manifest covs
age_with_MM	0.51	(0.48, 0.54)	0.02	Manifest covs
age_last_education_with_hadsd	-0.13	(-0.17, -0.09)	0.02	Manifest covs
age_last_education_with_depression_requiring_treatment	-0.05	(-0.11, 0.01)	0.03	Manifest covs
age_last_education_with_MM	-0.28	(-0.31, -0.24)	0.02	Manifest covs
depression_requiring_treatment_with_hadsd	0.29	(0.24, 0.34)	0.03	Manifest covs
hadsd_with_MM	0.25	(0.21, 0.29)	0.02	Manifest covs
depression_requiring_treatment_with_MM	0.19	(0.14, 0.25)	0.03	Manifest covs
age_to_cog_perf	-0.32	(-0.38, -0.26)	0.03	Manifest paths
age_last_education_to_cog_perf	0.33	(0.28, 0.38)	0.03	Manifest paths
MM	-0.25	(-0.31, -0.2)	0.03	Manifest paths
depression_requiring_treatment_to_cog_perf	0.17	(0.09, 0.25)	0.04	Manifest paths

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hadsd	-0.07	(-0.13, 0)	0.03	Manifest paths
one_to_mmse	10.15	(-38.21, 58.52)	24.68	Means
one_to_verbal_fluency	1.66	(-33.12, 36.44)	17.74	Means
one_to_age	2.89	(2.81, 2.98)	0.04	Means
one_to_age_last_education	4.44	(4.31, 4.57)	0.06	Means
one_to_hadsd	1.15	(1.1, 1.19)	0.03	Means
one_to_depression_requiring_treatment	9.29	(-391.25, 409.83)	204.36	Means
one_to_MM	0.92	(0.87, 0.96)	0.02	Means
mmse_with_mmse	0.48	(0.42, 0.54)	0.03	Residuals
verbal_fluency_with_verbal_fluency	0.73	(0.69, 0.77)	0.02	Residuals
age_with_age	1.00	(1,10)	0.00	Residuals
age_last_education_with_age_last_education	1.00	(1,10)	0.00	Residuals
hadsd_with_hadsd	1.00	(1,10)	0.00	Residuals
depression_requiring_treatment_with_depression_requiring_treatment	1.00	(1,10)	0.00	Residuals
MM_with_MM	1.00	(1,10)	0.00	Residuals

Model fit: $\chi^2(2) = 20.12$, $p < 0.001$; CFI = 0.993; TLI = 0.926; root mean square error of approximation = 0.058. Algebra' moderation' = 0.009; p-value = 0.04. CFI = Comparative Fit Index; covs = covariances; TLI = Tucker-Lewis Index.

Supplementary Material S1 Model specification and identification

```
lav = "  
cog_perf =~ mmse + verbal_fluency  
cog_perf ~ a*MM + b*hadsd + age_last_education + age + depression_requiring_treatment  
moderation := a*b  
"  
  
modmed <- umxRAM(lav, data = dt2, autoRun = F, tryHard = "ordinal", optimizer = "CSOLNP")  
  
mxCheckIdentification(modmed, details = F)$status  
  
Model is locally identified  
[1] TRUE
```