

## Appendix 1

Input for Episodic Memory Decomposition – Included in all analyses

TITLE: Decomposition of episodic memory into brain, demographic,  
and residual components;

DATA: FILE IS 'mem\_res\_0110.csv';

VARIABLE: NAMES ARE id educ gender ethnic epis exec bm hc wmh read  
time1 time2 time3 time4 time5 exec1 exec2 exec3 exec4 exec5  
cdrs1 cdrs2 cdrs3 cdrs4 cdrs5 dx1 dx2 dx3 d4 dx5 timedem cens  
age icv inf bmraw hcraw vm1 vm2 vm3 vm4 vm5 sem;  
MISSING ARE .;  
USEVARIABLES ARE epis educ2 male aa hisp icvst bmst hest wnhst;

DEFINE:

IF ethnic eq 4 THEN aa=1;  
IF ethnic ne 4 THEN aa=0;  
IF ethnic eq 6 THEN hisp=1;  
IF ethnic ne 6 THEN hisp=0;  
IF gender eq 1 THEN male=1;  
IF gender ne 1 THEN male=0;  
educ2=educ/10;  
icvst=(icv-1175.3398)/131.615307; ! Standardized  
bmst=(bmraw-917.58084)/109.129294; ! Standardized  
hest=(hcraw-3.62390357)/0.702137; ! Standardized  
wmhst=(wmh-1.67256281)/1.03106407; ! Standardized

MODEL:

! Create Latent Neuroimaging Variables Accounting for Measurement Error

bmst on icvst; ! Adjust bm for icv  
hest on icvst; ! Adjust hc for icv

bml by bmst@1;  
bmst@.10; ! Measurement error – reliability =.90  
bml with icvst@0;

hcl by hest@1;  
hest@.10; ! Measurement error – reliability =.90  
hcl with icvst@0;

wmhl by wnhst@1;  
wnhst@.10; ! Measurement error – reliability =.90

! Decompose Episodic Memory

```

memd on educ2@1.255 male aa hisp; ! One fixed regression coefficient for model identification
! Coefficient selected to fix memd variance at 1.0
memb on bml@1.654 hcl wmhl; ! One fixed regression coefficient for model identification
! Coefficient selected to fix memb variance at 1.0

memr by epis*;
memd by epis*;
memb by epis*;
epis@.1365; ! Measurement error – reliability =.85
memd@0;
memb@0;
memr@1;

```

```

! Residual correlations of memory components constrained to 0.0
memd with memb@0 memr@0;
memb with memr@0;

```

```

! Residual correlations of memory components with MRI and demographic variables constrained to 0.0
memr on educ2@0 male@0 aa@0 hisp@0 bml@0 hcl@0 wmhl@0;
memd on bml@0 hcl@0 wmhl@0;
memb on educ2@0 male@0 aa@0 hisp@0;

```

```

! Correlations empirically identified as not statistically significant constrained to 0.0 to facilitate model
convergence
educ2 with hcl@0 male@0 aa@0;
aa with bml@0 hcl@0 wmhl@0;
hisp with hcl@0;
male with wmhl@0 hcl@0 hisp@0;

```

ANALYSIS: estimator=ml;

### **Additional commands for ordinal logistic regression of baseline diagnosis**

```

VARIABLE:          USEVARIABLES = dx1;
                   CATEGORICAL=dx1;

MODEL:             dx1 on memd memb memr;

ANALYSIS:          ESTIMATOR = wlsmv;

```

### **Additional commands for regression of baseline CDR Sum**

```

VARIABLE:  USEVARIABLES = cdrs1;

Model:    cdrs1 on memd memb memr;

```

### **Additional commands for regression of baseline Reading**

VARIABLE: USEVARIABLES = read;

Model: read on memd memb memr;

### **Additional commands for Cox proportional hazards modeling of conversion from non-dementia to dementia**

VARIABLE: USEVARIABLES = timedem cens;  
SURVIVAL = timedem;  
TIMECENSORED = cens ( 0 = NOT, 1 = RIGHT);

MODEL: timedem on memd;  
timedem on memb;  
timedem on memr;

ANALYSIS: BASEHAZARD = off;  
ESTIMATOR = mlr;

### **Additional commands for latent growth modeling of Executive Function**

VARIABLE: USEVARIABLES = time1-time5 exec1-exec5;  
TSCORES = time1-time5;

MODEL: i s | exec1-exec5 at time1-time5;  
i on memd memb memr;  
s on memd memb memr;

ANALYSIS: TYPE = random;

### **Additional commands for latent growth modeling of Executive Function including**

#### **Mem-B X Mem-R interaction and baseline diagnosis as a covariate**

VARIABLE: USEVARIABLES = time1-time5 exec1-exec5 norm dem;  
TSCORES = time1-time5;

DEFINE: if dx1 eq 2 then dem=1;  
if dx1 ne 2 then dem=0;  
if dx1 eq 0 then norm=1;  
if dx1 ne 0 then norm=0;

MODEL: i s | exec1-exec5 at time1-time5;  
brint | memb xwith memr;  
i on memd memb memr brint;  
s on memd memb memr brint;  
i on norm dem;

s on norm dem;

ANALYSIS:   TYPE = random;  
              ALGORITHM=integration;

## Appendix 2

### ESTIMATED SAMPLE STATISTICS – Core Memory Decomposition Model

#### Means

EPIS	ICVST	BMST	HCST	WMHST	EDUC2	MALE	AA	HISP
-0.41	0.00	0.00	0.00	0.00	1.27	0.37	0.33	0.26

#### Correlations (variances on diagonal)

	EPIS	ICVST	BMST	HCST	WMHST	EDUC2	MALE	AA	HISP
EPIS	0.91								
ICVST	-0.08	1.00							
BMST	0.06	0.86	1.00						
HCST	0.26	0.36	0.41	1.00					
WMHST	-0.16	0.12	0.04	-0.07	1.00				
EDUC2	0.32	0.12	0.05	0.09	0.11	0.20			
MALE	-0.26	0.58	0.44	0.17	-0.01	-0.03	0.23		
AA	0.12	-0.25	-0.24	-0.21	0.04	0.10	-0.13	0.23	
HISP	-0.18	-0.12	0.05	0.05	-0.17	-0.50	-0.03	-0.42	0.19

ESTIMATED SAMPLE STATISTICS – Additional statistics for ordinal logistic regression of baseline diagnosis

Intercepts

dx1\$1	dx1\$2
0.08	1.08

Correlations

	dx1
EPIS	-0.79
ICVST	-0.01
BMST	-0.18
HCST	-0.34
WMHST	0.23
EDUC2	-0.09
MALE	0.12
AA	-0.10
HISP	-0.09

ESTIMATED SAMPLE STATISTICS – Additional statistics for regression of baseline CDR Sum

Mean

CDRS1
1.31

Correlations (variance on diagonal)

	CDRS1
CDRS1	3.82
EPIS	-0.52
ICVST	-0.01
BMST	-0.15
HCST	-0.28
WMHST	0.21
EDUC2	-0.10
MALE	0.05
AA	-0.11
HISP	-0.07

ESTIMATED SAMPLE STATISTICS – Additional statistics for regression of baseline Reading

Mean

READ
-0.07

Correlations (variance on diagonal)

	READ
READ	0.97
EPIS	0.34
ICVST	0.07
BMST	0.08
HCST	0.11
WMHST	0.10
EDUC2	0.43
MALE	-0.23
AA	-0.15
HISP	-0.09



ESTIMATED SAMPLE STATISTICS – Additional statistics for latent growth models of Executive Function

Means

EXEC1	EXEC2	EXEC3	EXEC4	EXEC5
-0.20	-0.28	-0.36	-0.44	-0.50

Correlations (variances on diagonal)

	EXEC1	EXEC2	EXEC3	EXEC4	EXEC5
EXEC1	0.48				
EXEC2	0.84	0.57			
EXEC3	0.79	0.85	0.63		
EXEC4	0.78	0.83	0.90	0.79	
EXEC5	0.72	0.75	0.81	0.88	0.86
EPIS	0.64	0.64	0.71	0.74	0.73
ICVST	0.22	0.15	0.10	0.15	0.01
BMST	0.28	0.26	0.22	0.26	0.15
HCST	0.22	0.20	0.28	0.25	0.24
WMHST	-0.09	-0.15	-0.18	-0.21	-0.18
EDUC2	0.45	0.39	0.35	0.35	0.23
MALE	-0.10	-0.11	-0.17	-0.13	-0.2
AA	0.00	-0.03	-0.02	0.08	0.17
HISP	-0.28	-0.17	-0.13	-0.12	-0.07