AIBL/Australian ADNI:
CLINICAL UPDATE
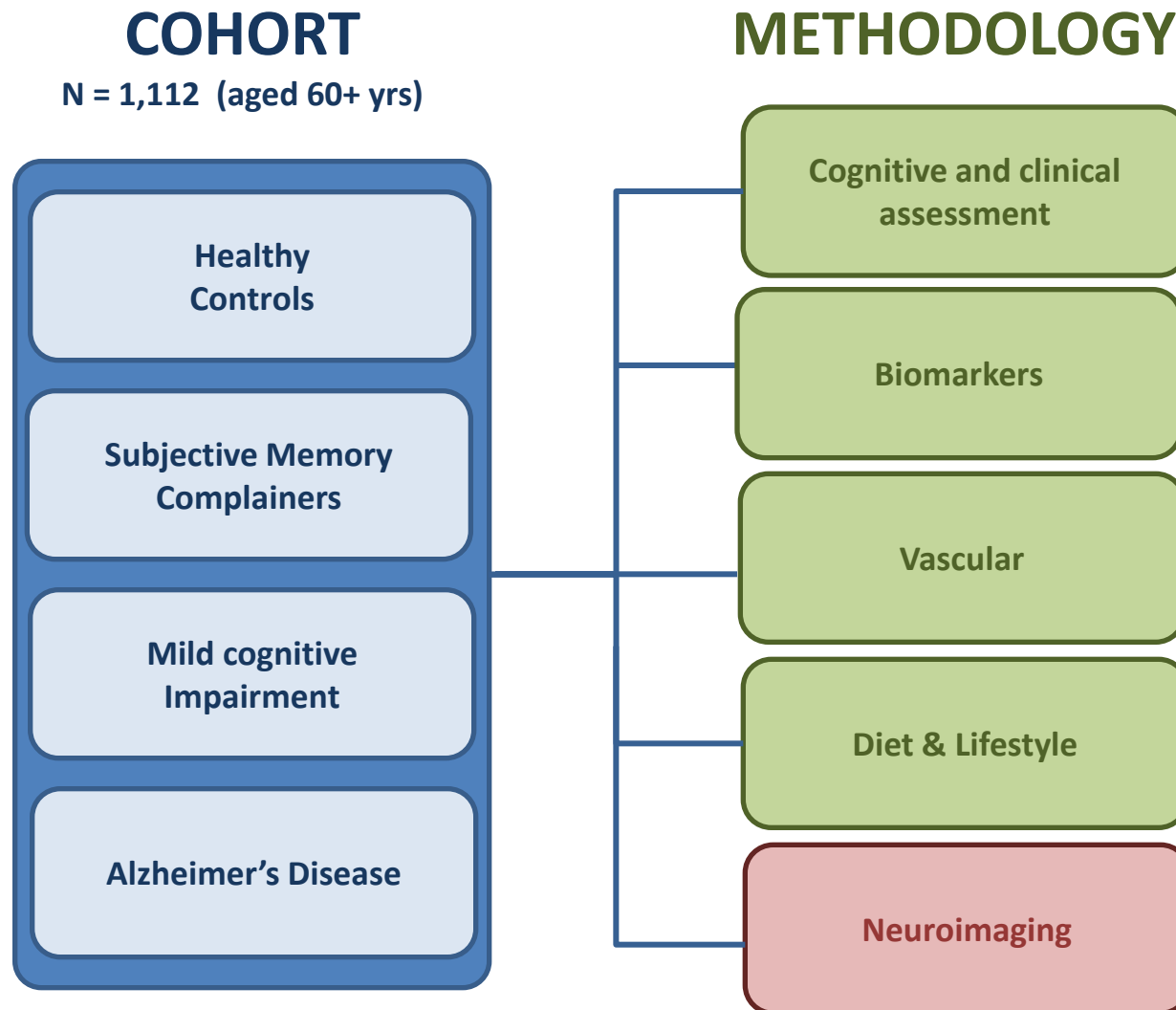
Dr Kathryn Ellis

AIBL national manager and cognitive stream co-leader

On behalf of the AIBL management team

AIBL - overview

OVERVIEW: AIBL is the most comprehensive, longitudinal study of its kind in Australia, and aims to discover a way to develop biomarkers, diagnose patients earlier and prevent disease onset.

COHORT
N = 1,112 (aged 60+ yrs)

Healthy Controls
Subjective Memory Complainers
Mild cognitive Impairment
Alzheimer's Disease

METHODOLOGY

Cognitive and clinical assessment
Biomarkers
Vascular
Diet & Lifestyle
Neuroimaging

AIBL: Longitudinal cohort

Baseline
(1,112)
Psychometrics
Bloods
MRI/PET
Lifestyle
Genotype

| 372 NMC | 396 SMC | 133 MCI | 211 AD |

(33) (29) (28) (50)

Non-Return:
112
Deceased:
NMC 2
SMC 4
MCI 5
AD 17

(220) (97) (114) **(254)** (7) (4) (13) **(65)** (1) (3) (32) **(161)** (1 PDD)

18M
(972)
Psychometrics
Bloods
MRI/PET

| 317 NMC | 375 SMC | 82 MCI | 197 AD | **1 Non-AD Dementia** |

(39) (40) (23) (62)

Non-Return:
120
Deceased:
NMC 3
SMC 3
MCI 4
AD 34

(3)VaD

(212) (78) (62) **(241)** (5) (4) (14) **(35)** (1) (1) (16) **(134)** **(1)PDD**

(1)VaD

36M
(824)
Psychometrics
Bloods
MRI/PET

(11)

Returned at 36 months
16

| 301 NMC | 309 SMC | 55 MCI | 154 AD | **5 Non-AD Dementia** |

(1) (1) (3)

See AAIC poster P3-093 on Tuesday 1 – 3.30pm. Ellis et al.

Healthy to MCI transition over 18 and 36 months

aibl
The Australian Imaging, Biomarkers and
Lifestyle Flagship Study of Ageing

372 NMC   396 SMC   133 MCI
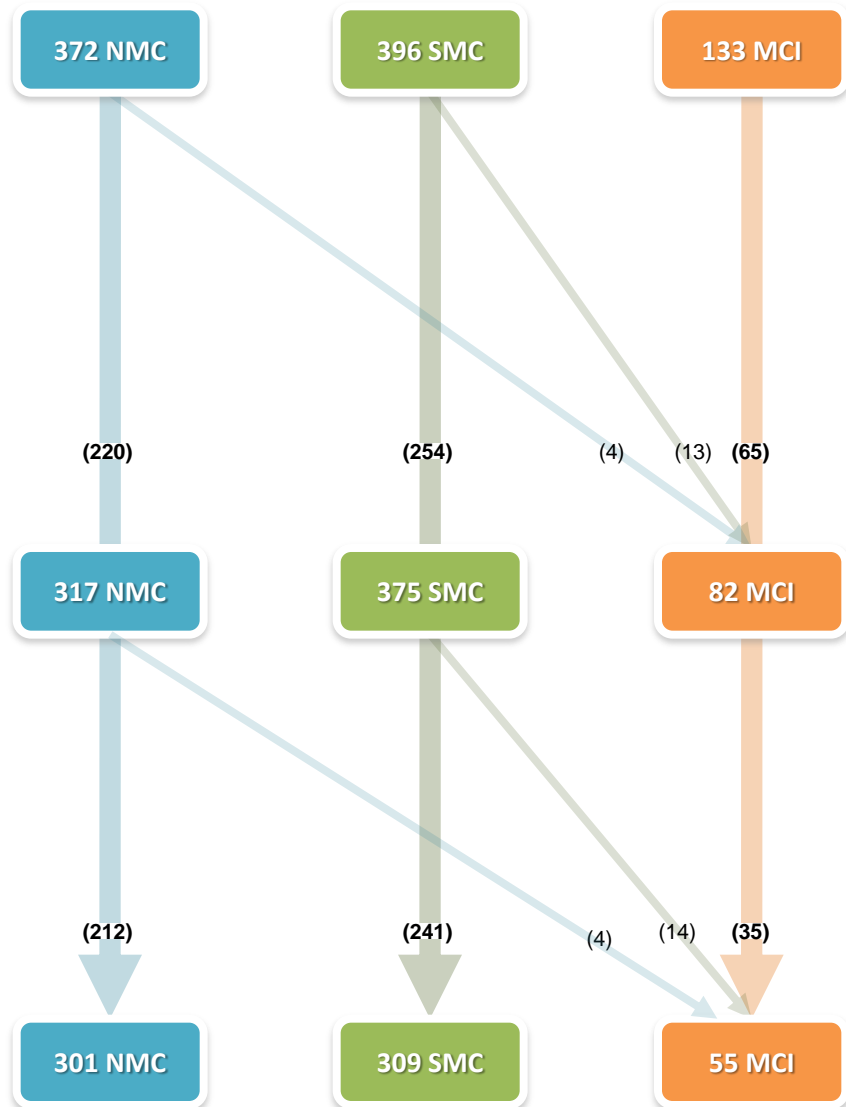
Survival analysis was conducted to examine transition rates

(220)   (254)   (4)   (13)   (65)

317 NMC   375 SMC   82 MCI

HC to MCI transition was 2.5% at 18-months (17 cases)

(212)   (241)   (4)   (14)   (35)

301 NMC   309 SMC   55 MCI

HC to MCI transition was 5.7% by 36-months (additional 18 cases).

MCI to AD transition over 18 and 36 months
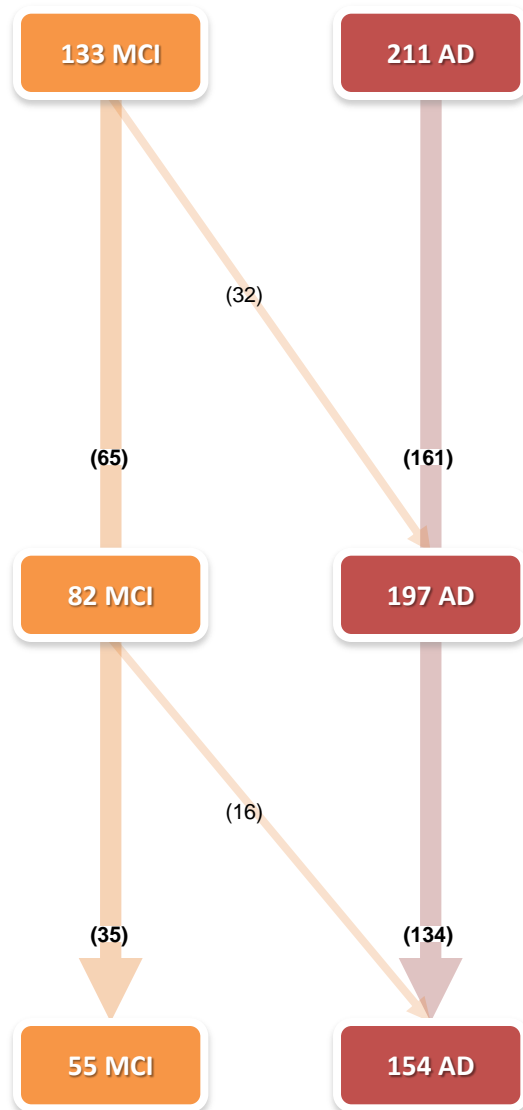
MCI to AD transition was 30.5% at 18-months (32 cases)

MCI to AD transition was 80% by 36-months (additional 16 cases).

By the 36 month time-point only 26 of the original 133 MCI cases were still in this category.
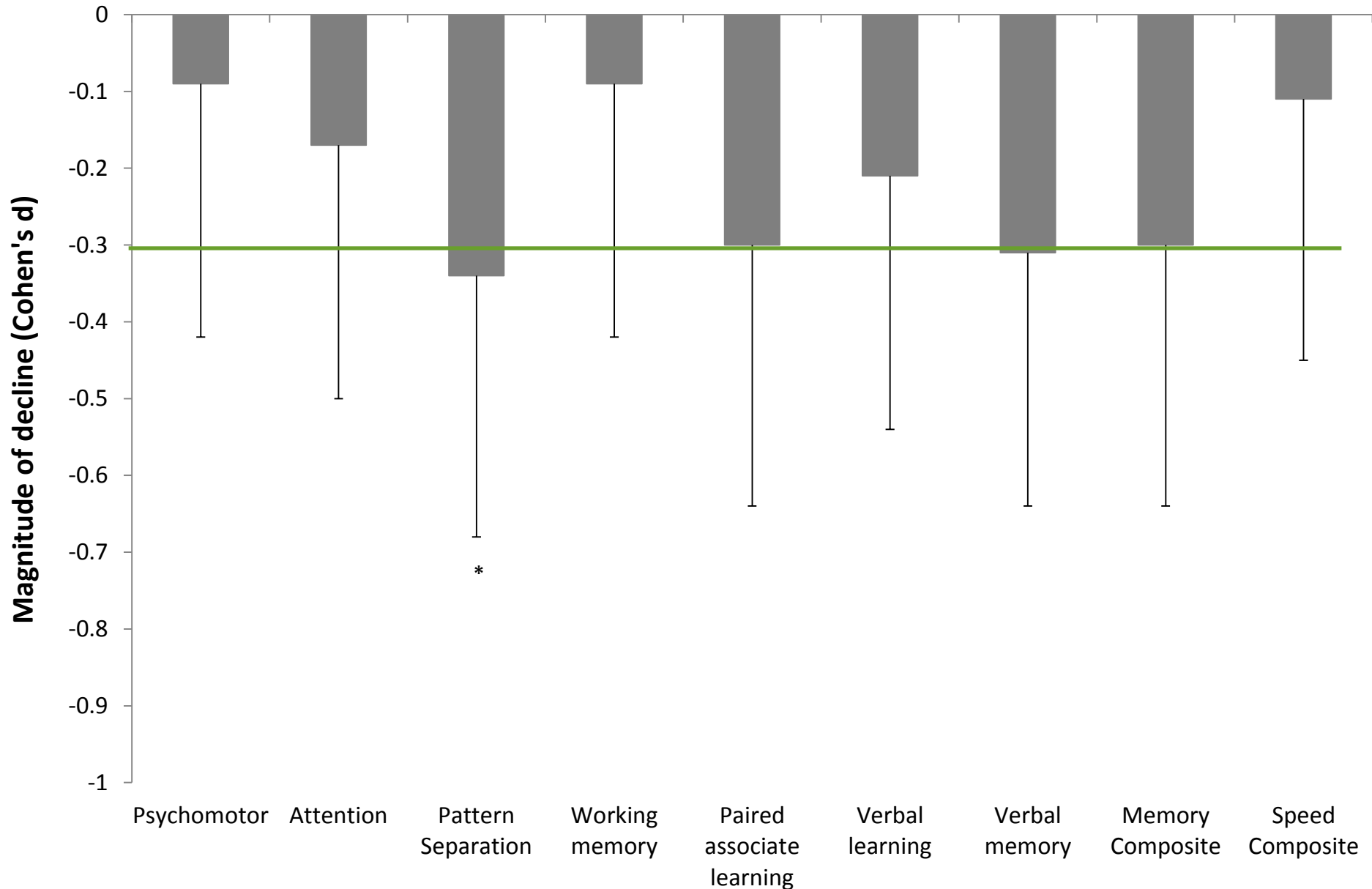
Comparing "stable" and "transition" groups

Demographic characteristics of "stable" groups (those who remain in the same category) and "transition" groups" (those who change category towards disease classifications) over the initial 18-month period

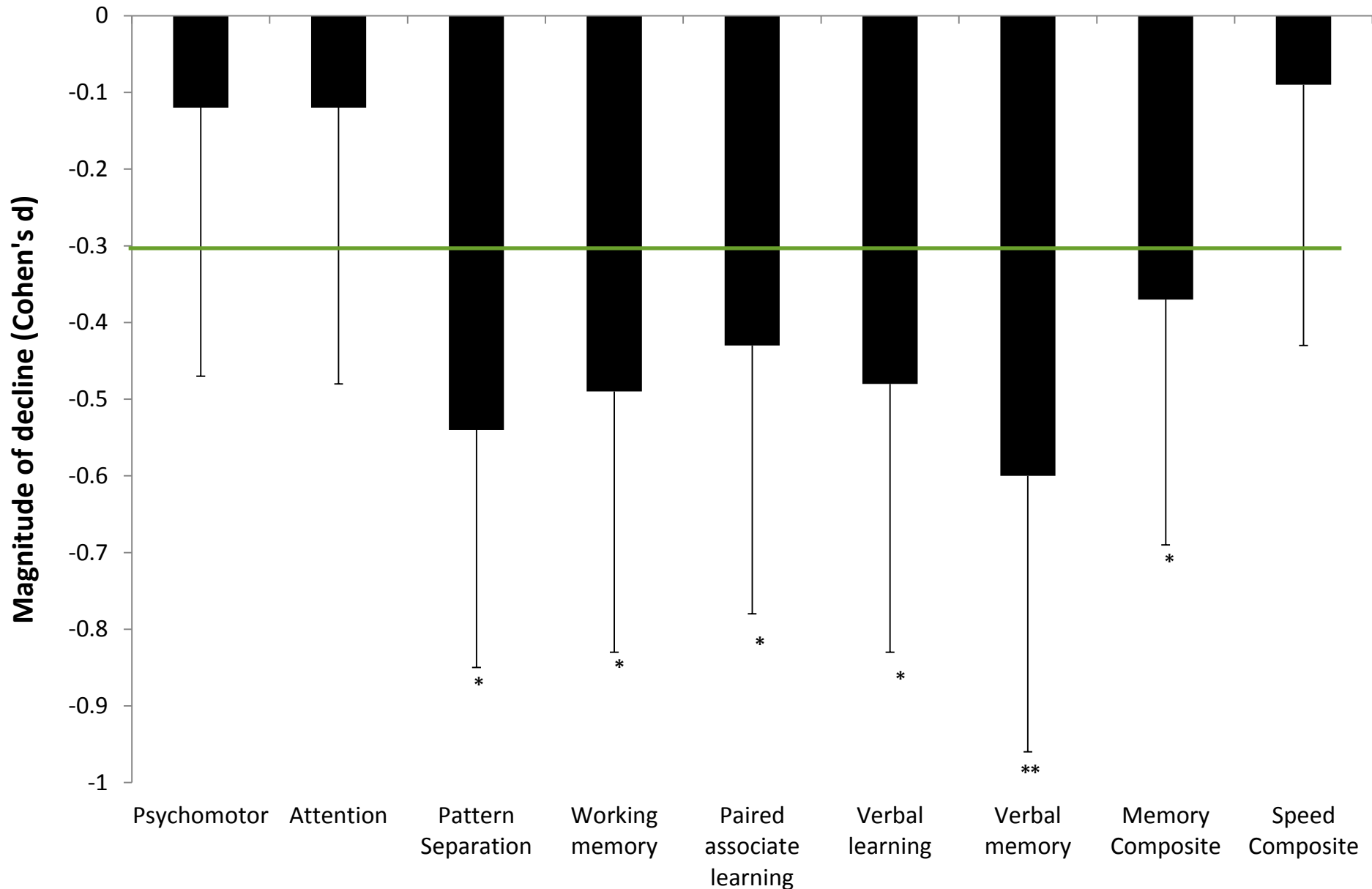|	HC Stable (N = 685)	HC transitioned to MCI (N = 17)	MCI stable (N = 63)	MCI transitioned to AD (N = 32)
Age (years)	69.7 (6.8)	71.7 (7.0)	75.5 (7.7)	76.4 (7.3)
Percentage female	58.7%	41.2%	53.8%	59.4%
Percentage APOE ε4	26.3%	47.1%	36.9%*	78.1%*
Education (<=12 years)	45.2%	70.6%	52.3%	68.8%
Premorbid IQ	43.1 (6.0)	42.8 (5.4)	40.2 (9.3)	41.3 (7.4)
HADS-D	2.6 (2.2)	2.8 (2.5)	3.7 (2.8)	3.2 (2.2)
HADS-A	4.3 (2.9)	4.5 (2.1)	5.0 (3.0)	4.5 (2.5)

Focus on healthy control volunteers

- A number of collaborative projects examining conversion/transition from HC within AIBL

- Evidence of bimodality in AIBL HC group – higher performers less likely to convert to MCI or AD - using a number of statistical models

- Cognition combined with biomarkers is aiding in detection of "at risk" HC population
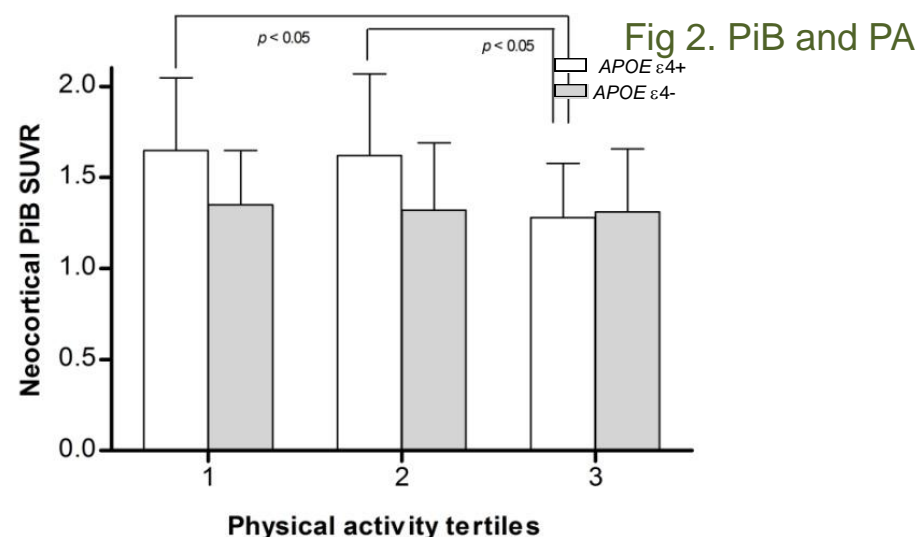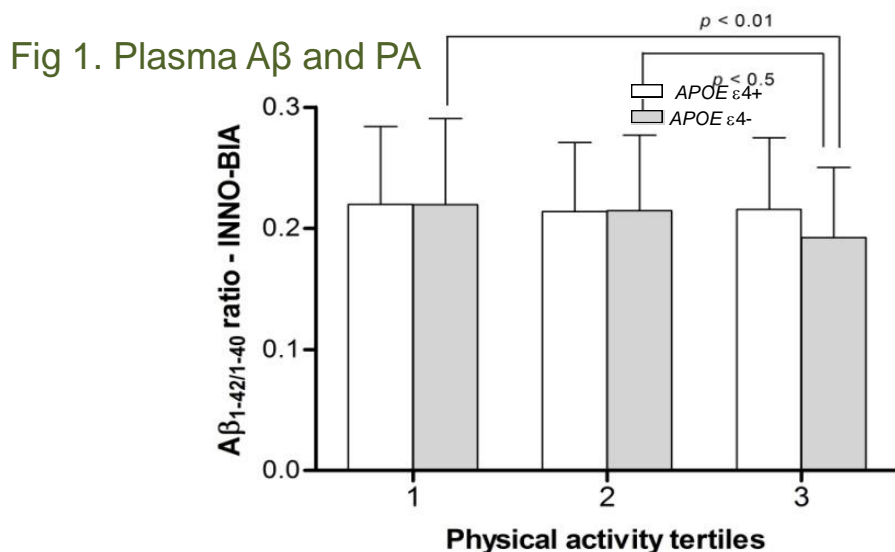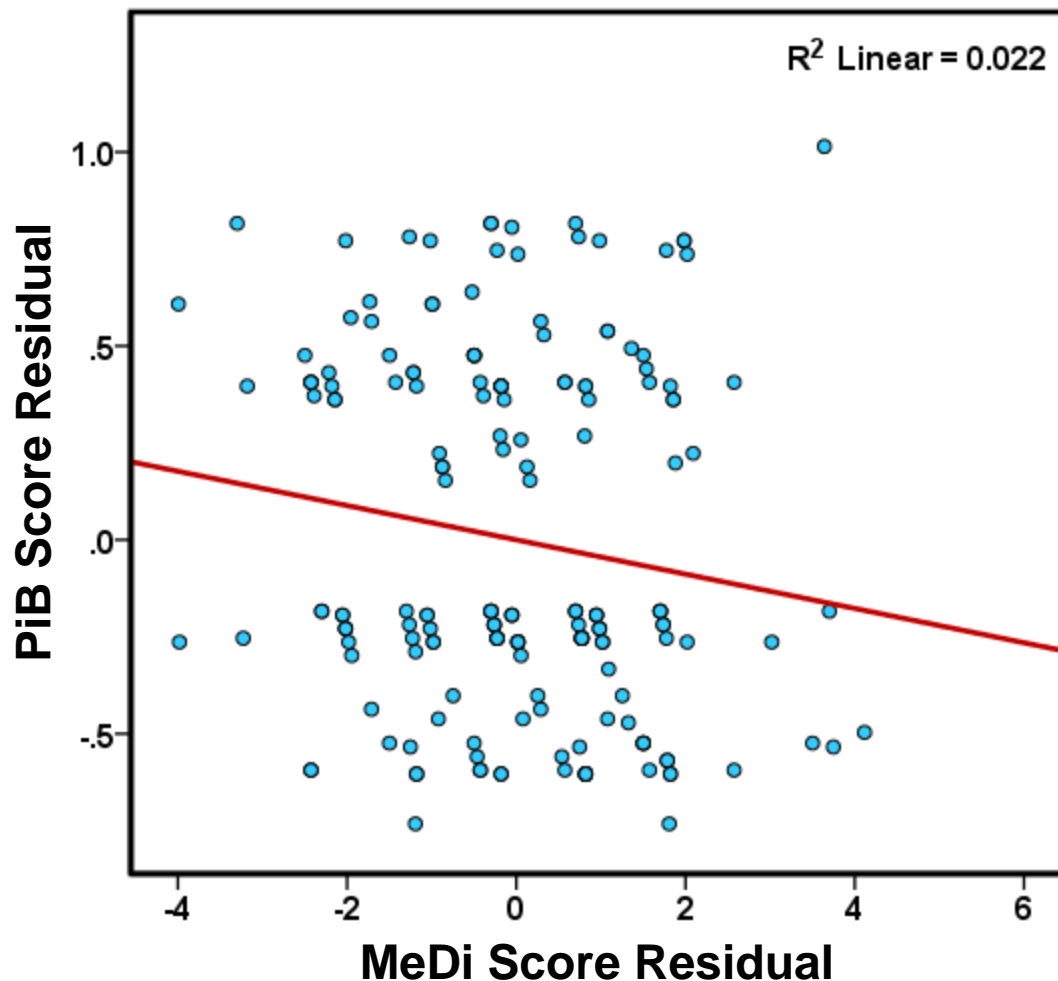
Magnitude of decline over 18 months (ApoE ε4+)

Lim et al. *See AAIC oral presentation: Tuesday 11.30 to 13 00, Session O3-05 .*

Magnitude of decline over 18 months (High Aβ)

Lim et al. *See AAIC oral presentation: Tuesday 11.30 to 13 00, Session O3-05 .*

- Non *APOE* ε4 carriers who were engaged in high levels of exercise had significantly lower plasma $Aβ_{1-42/1-40}$ ratio.

- *APOE* ε4 carriers who were engaged in high levels of exercise showed lower [^{11}C] PiB PET levels than ε4 carriers with lower levels of exercise.

- This may reflect different mechanisms at play for APOE ε4 carriage and Aβ in the brain versus the periphery.

Fig 1. Plasma Aβ and PA

Fig 2. PiB and PA

Brown et al. 2012, accepted Molecular Psychiatry.

Higher Medeteranian Diet (MeDi) Score is associated with lower PiB SUVR

Controlling for age, APOE genotype, gender and years of education.

aibl **ROCS**

Characterize the cognitive performance of a group of 205 healthy older adults, and adults with MCI, and AD over short test-retest intervals (10 times over 18-months).

aibl **ACTIVE**

RCT of physical activity to delay the progression of white matter hyperintensities on MRI in older adults at risk of cognitive decline

aibl WHAP

Prospective data from midlife, 3 cognitive timepoints over 20 years prior. 100 participants seen so far 80% retention from 2002 cognitive test

Acknowledgements and thanks