

AFQT scores than MCI-discordant pairs; MCI-discordant pairs had lower scores than normal-concordant pairs. *Within-pair* AFQT differences were observed only in dizygotic discordant pairs; normal twins scored higher. Overall results were similar for age 55 AFQT even after adjusting for age 20 scores. **Conclusions:** Neuropsychologically-defined MCI is present in the sixth decade of life (50s) in non-clinically referred, community-dwelling adults. A unique feature of the discordant twin design enabled us to identify unobserved heterogeneity. The subgroups of normal twins are phenotypically the same, but differed in premorbid cognitive ability based on genetic risk (i.e., having a normal or MCI co-twin). Differences based on genetic risk for the MCI phenotypes followed the same pattern. Premorbid ability is not the entire story, however, because differences persist even after adjusting for premorbid ability. Finally, genetic influences cannot cause differences in genetically-identical monozygotic twins. Therefore, the fact that premorbid cognitive differences within discordant pairs were accounted for by only dizygotic twins suggests that the link between premorbid cognitive ability and MCI is due to some degree of shared genetic influences.

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### SPECIFIC SEMANTIC MEMORY DEFICITS AND NEUROFUNCTIONAL ALTERATIONS IN MILD COGNITIVE IMPAIRMENT

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**Background:** Semantic memory decline is an early cognitive marker of Mild Cognitive Impairment (MCI). In this study a semantic battery was used to evaluate semantic decline in MCI patients and matched controls. Brain structural and functional connectivity patterns were also examined. **Methods:** Eighteen MCI patients (mean age 70.06, SD 4.42; mean education 8.83, SD 4.77) and twenty healthy controls (mean age 68.47, SD 4.07; mean education 11.44, SD 5.06) were tested with a semantic memory battery and imaged with MRI on a 3T GE scanner. The battery included visual naming, word-definition matching of objects, actions and famous people, reading, category fluency for animals, fruits, tools, furnitures, singers, politicians, actions and a word-association fluency task for early and late acquired words. The MRI protocol consisted of 3D structural imaging and resting state (eyes open) fMRI. Advanced Normalization Tools (ANTs) were used to analyse the MRI data. The connectivity Default Mode Network (DMN) was identified using independent component analysis. **Results:** MCI patients scored significantly lower in total reading, reading of famous people, word-definition matching for famous people, total naming, naming of objects and famous people and showed poorer immediate recall for objects and famous people. These patients also obtained significant lower scores on semantic fluency in all categories, except for tools, and produced a higher number of items in response to late acquired word probes. Voxel-based morphometry analysis revealed greater atrophy in left medio-temporal regions in the MCI group. DMN connectivity was also lower in posterior cingulate and precuneus areas in the patient group than in controls. **Conclusions:** Visual naming, especially for objects and famous people, reading and semantic fluency were all impaired in MCIs and these tasks might be valid neuropsychological markers in the early detection of cognitive decline. The MCIs also had structural and functional alterations in brain regions involved in memory processes (medio-temporal and parietal regions) suggesting that this regional brain damage might underline the episodic and semantic memory deficits detected at such an early stage of decline.

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### USING THE CANTAB COMPUTERIZED BATTERY TO DISCRIMINATE MILD COGNITIVE IMPAIRMENT AND DEMENTIAS

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**Background:** While the CANTAB computerized battery has been used in clinical research to identify pre-clinical Alzheimer's disease (De Jager et al., 2002; Egerhaziet al., 2007), the literature on its diagnostic utility is not extensive and its discriminative abilities for examining mild cognitive impairment (MCI) and different dementias are not currently known. The current study seeks to assess the discriminative utility of the CANTAB computerized battery for use in future clinical research, and its discriminant validity with traditional neuropsychological measures. **Methods:** Participants included MCI (N=18), Alzheimer's disease (AD, N=53), and Other Dementia (O-DEM, N=18; made up of roughly equivalent numbers of FTD and DLB participants) groups evaluated at the Michigan Alzheimer's Disease Research Center (MADRC). Diagnoses were established through consensus. Participants were administered the CANTAB computerized battery, consisting of measures of visual memory, attention, associated learning, working memory, and reaction time, along with traditional neuropsychological measures from the National Alzheimer's Disease Cooperating Center Unified Data Set battery. **Results:** Measures of spatial working memory (SWM), visual memory (delayed-match-to-sample; DMS), and paired associative learning (PAL) discriminated among diagnostic groups. AD performed worse than MCI and Other Dementia groups on PAL, and worse than only the MCI group on SWM. Both dementia groups performed worse than the MCI group on DMS. These specific CANTAB variables showed the greatest correlation to standard neuropsychological tests, with PAL showing highest correlations with standard memory tests ( $r=.43$ ), DMS with visual attention and mental flexibility tests ( $r=.33$  and  $r=.43$ , respectively), and SWM with orientation and visual learning tests ( $r=.44$  and  $r=.38$ , respectively). **Conclusions:** Particular measures from the CANTAB computerized battery chosen for this study appear to be effective in discriminating pre-clinical dementia (MCI) from dementia groups (AD and O-DEM). Assessment of standard scores also suggested that the MCI group performed below expectation relative to normative samples. The results with PAL suggest particular sensitivity to variable cognitive performance between dementia groups and, in particular, sensitivity to the learning and memory deficits apparent in AD. The PAL displayed strong discriminant validity, and may be especially useful in both clinical and research settings as a supplement to traditional neuropsychological tasks when differentiation of AD patients is essential.

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### MILD COGNITIVE IMPAIRMENT IN OLDER AUSTRALIANS FROM NON-ENGLISH SPEAKING BACKGROUNDS

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**Background:** Well-documented difficulties exist in screening for objective cognitive impairment among older people from non-English speaking backgrounds. Research findings on ethnic and racial disparities in prevalence of mild cognitive impairment (MCI) have been equivocal. The aims of this study were to compare the prevalence of MCI and progression to dementia after two years in participants from English-speaking backgrounds (ESB) and non-English speaking backgrounds (NESB). **Methods:** The sample comprised 987 non-demented community-living adults aged 70-90 years, of whom 827 were from ESB and 160 from NESB (defined as those who acquired conversational English = 10 years of age). Participants were from the Sydney Memory and Ageing Study, a longitudinal epidemiological cohort. All underwent a brief screening questionnaire to ensure sufficient English proficiency to complete assessments. At baseline, participants received comprehensive English language neuropsychological and medical assessments. Questionnaires measuring functional impairment and subjective cognitive complaints (SCC) were completed by participants or informants. Assessments were repeated two years later. **Results:** Significantly more