

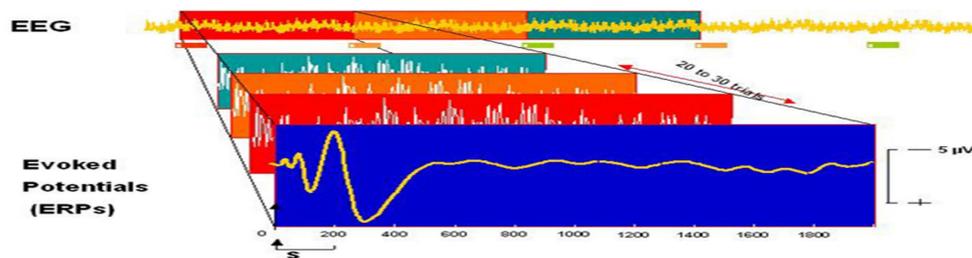
Can Event Related Potentials using a Language Paradigm Help Diagnose Mild Cognitive Impairment?

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BACKGROUND

- 16.8% of those over 65 have Mild Cognitive Impairment (MCI) (Graham et al., 1997).
- Semantic memory can be affected in MCI (Joubert et al., 2008).
- Event-Related Potentials (ERPs) are derived from electroencephalogram (EEG) and provide a measure of cortical activity with a high level of temporal resolution.



- This study examines ERPs during a verbal recognition task in patients with MCI and healthy controls (HC). These components are associated with semantic memory (Kutas & Iragui, 1998).

METHODS

- 12 MCI patients from the Bruyère Memory Program and 16 HCs from the general population.
- Cognitive tests: MoCA, RBANS subtests, and Trail Making A & B.
- EEGs were recorded with NeuroScan NuAmps 4.3 and analyzed with Brain Analyzer 2.1.
- Participants indicated if words on the computer screen were repeated or non-repeated.
- N400 waves and Late Positive Complexes from the ERP were analyzed.

Participants

	MCI (n=12; 6 females)	HC (n=16; 11 females)	P
Age	76.4 (6.3)	72.3 (6.1)	.09
Education	14.7 (2.6)	15.6 (3.1)	.40

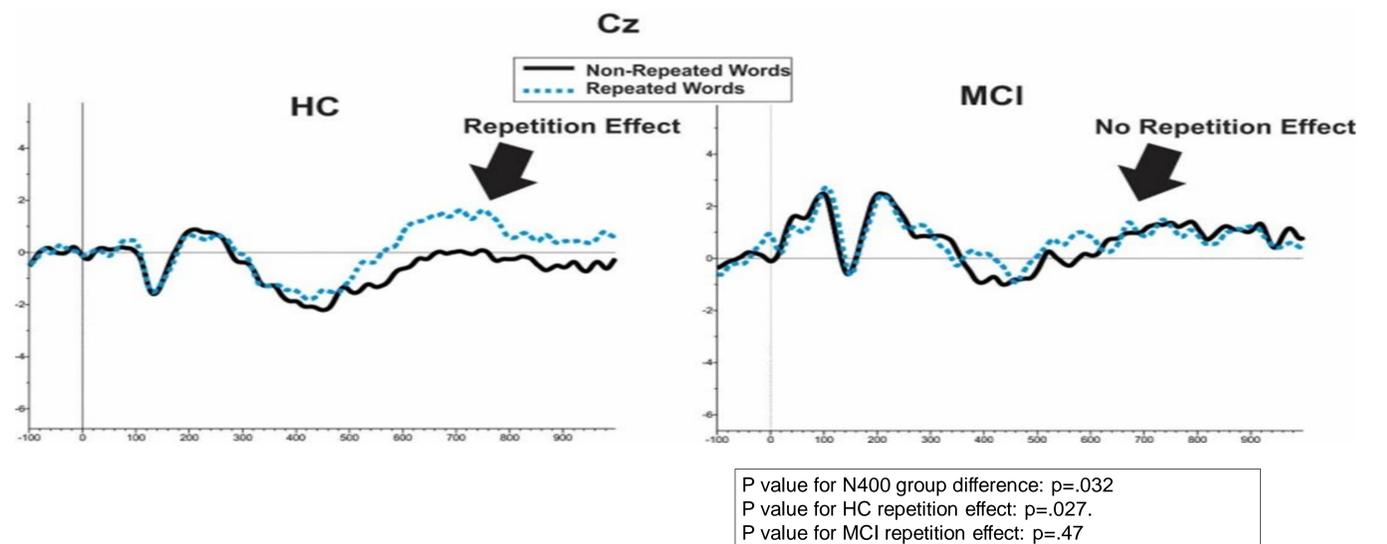
Cognitive Tests Results

Test	MCI (n=12)	HC (n=16)	P
MoCA	22.5 (2.6)	27.6 (1.7)	<.001
RBANS Total	79.8 (10.2)	114.3 (9.3)	<.001
Imm. Memory	71.2 (10.2)	108.8 (10.6)	<.001
Del. Memory	62.3 (15.6)	107.9 (12.9)	<.001
Visiospat/Constr	110.2 (15.5)	124.9 (8.9)	.009
Language	88.9 (9.5)	99.9 (12.6)	.018
Attention	90.4 (12.0)	107.2 (12.0)	.001
Trails A (sec)	55.9 (29.1)	38.13 (12.4)	.067
Trails B (sec)	169.5 (81.6)	81.94 (23.9)	.003

RESULTS

Verbal Recognition Performance

Task Condition	ACCURACY (%)			RESPONSE TIME (msec)		
	MCI (n=12)	HC (N=16)	P	MCI (n=12)	HC (n=16)	P
Non-Repeated Words	88.1 (11.6)	94.5 (1.7)	.080	1323.0 (379.1)	917.2 (144.7)	.004
Repeated Words	60.3 (12.8)	71.1 (12.5)	.033	1238.2 (239.7)	919.8 (114.8)	.001



DISCUSSION

- MCI group performed less well on traditional cognitive testing, was slower and made more mistakes than HC during the verbal recognition task.
- MCI exhibited reduced N400 amplitude and did not exhibit the expected LPC word repetition effects seen in HC.
- Further work will be required to clarify the role of ERPs as a diagnostic tool for semantic impairment in MCI patients.

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