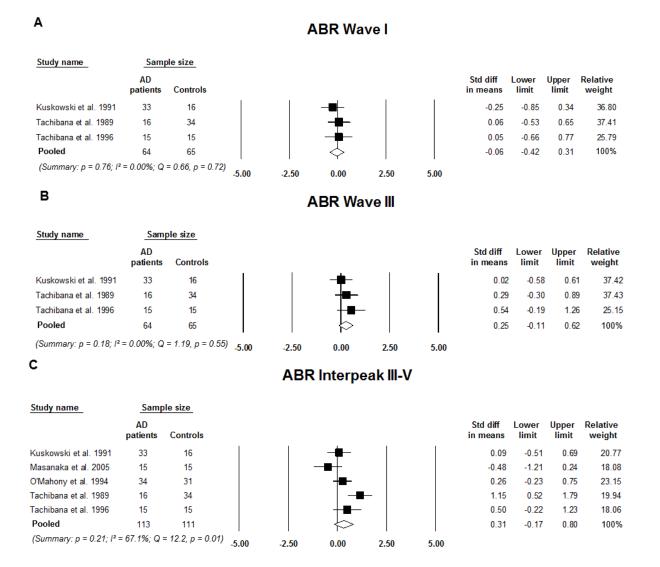
## **Supplementary Material**

Investigating Auditory Electrophysiological Measures of Participants with Mild Cognitive Impairment and Alzheimer's disease: A Systematic Review and Metaanalysis of Event-Related Potential Studies

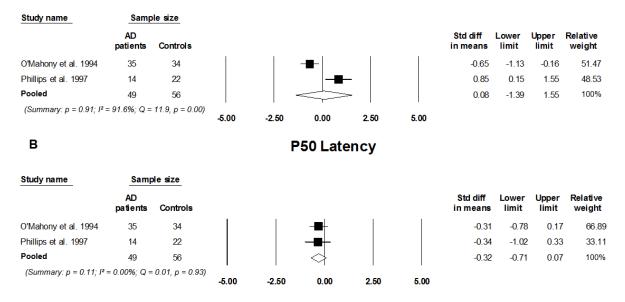


**Supplementary Figure 1.** Standard mean difference and pooled estimated of each study included in the meta-analyses of auditory brainstem responses (ABR) elicited using the passive rarefaction click paradigm. All the analyses compare participants with Alzheimer's disease (AD) to controls A) analysis of ABR wave I latency, B) analysis of ABR wave III, and C) analysis of ABR interpeak wave III-V. Summary includes: p = significance level;  $I^2 =$  percentage of heterogeneity; Q = Cochrane's Q. The horizontal lines represent the 95% confidence interval for each computed standard mean difference. Note: weights are from random effects analysis.

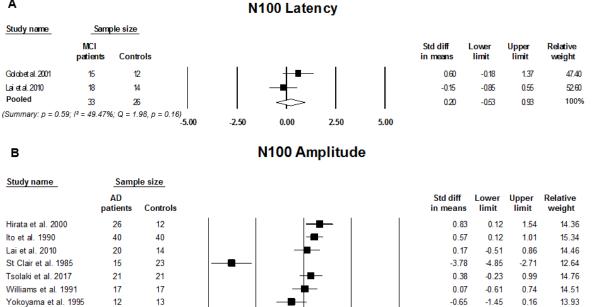
## MMN Amplitude

Study name											
	AD	нс						Std diff in means	Lower limit	Upper limit	Relative weight
Boller et al. 2002	10	12						0.198	-0.643	1.039	23.23
Riekkinen et al. 1997	19	14						0.080	-0.610	0.771	34.47
Jiang et al. 2017	15	30			_∎-			-0.324	-0.947	0.300	42.30
Pooled	44	56			$\diamond$			-0.063	-0.469	0.342	100%
(Summary: p = 0.76; l² = 0.00%;	Q = 1.	21, p = 0.	55) - <b>5.00</b>	-2.50	0.00	2.50	5.00				

**Supplementary Figure 2.** Standard mean difference and pooled estimated of each study included in the meta-analyses of mismatch negativity (MMN) elicited using the passive two-tone oddball paradigm. Comparing participants with Alzheimer's disease (AD) to controls. Summary includes: p = significance level;  $I^2 =$  percentage of heterogeneity; Q = Cochrane's Q. The horizontal lines represent the 95% confidence interval for each computed standard mean difference. Note: weights are from random effects analysis.



**Supplementary Figure 3.** Standard mean difference and pooled estimated of each study included in the meta-analyses of P50 elicited using the passive rarefaction click paradigm. A) comparing P50 amplitude between participants with Alzheimer's disease (AD) to controls, B) comparing P50 latency between participants with AD and controls, Summary includes: p = significance level; I<sup>2</sup> = percentage of heterogeneity; Q = Cochrane's Q. The horizontal lines represent the 95% confidence interval for each computed standard mean difference. Note: weights are from random effects analysis.



0.00

N100 Amplitude

2.50

5.00

-0.27

Std diff

in means

-349

-0.58

-1.09

Lower

limit

-4.69

-1.30

0.55

Upper

limit

-229

0.13

100%

Relative

weight

48.56

51.44

100% Pooled 33 26 -200 -4.84 0.85 (Summary: p = 0.17; l<sup>2</sup> = 93.9%; Q = 16.6, p = 0.00) -5.00 -2.50 0.00 2.50 5.00 Supplementary Figure 4. Standard mean difference and pooled estimated of each study included in the meta-analyses of N100 elicited using an active two-tone oddball paradigm. A) comparing N100 latency between participants with MCI to controls, B) comparing N100

amplitude between AD participants to controls, and C) comparing N100 amplitude between participants with MCI to controls. Summary includes: p = significance level;  $I^2 = percentage$ of heterogeneity; Q = Cochrane's Q. The horizontal lines represent the 95% confidence interval for each computed standard mean difference. Note: weights are from random effects analysis.

А

Pooled

С

Study name

Golobetal 2001

Lai et al. 2010

151

Sample size

Controls

12

14

(Summary: p = 0.52; l<sup>2</sup> = 90.4%; Q = 62.9, p = 0.00)

MCI

patients

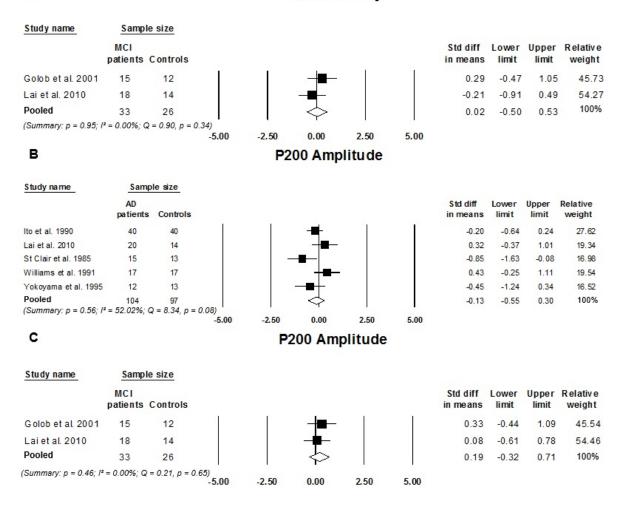
15

18

140

-5.00

-2.50

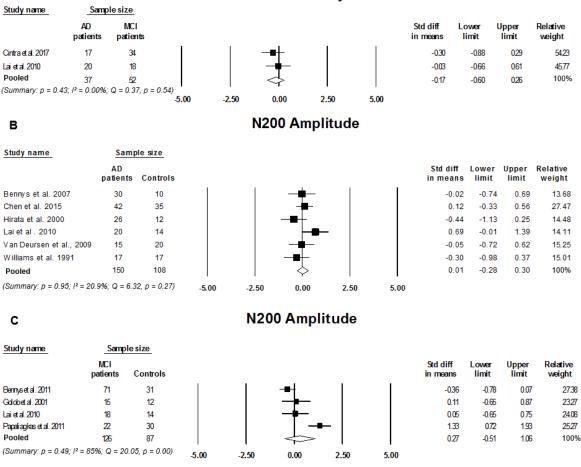


**Supplementary Figure 5.** Standard mean difference and pooled estimated of each study included in the meta-analyses of P200 elicited using an active two-tone oddball paradigm. A) Comparing P200 latency between participants with mild cognitive impairment (MCI) to controls, B) comparing P200 amplitude between participants with Alzheimer's disease (AD) to controls, and C) comparing P200 amplitude between participants with MCI to controls. Summary includes: p = significance level;  $I^2 =$  percentage of heterogeneity; Q = Cochrane's Q. The horizontal lines represent the 95% confidence interval for each computed standard mean difference. Note: weights are from random effects analysis.

Α

Α

## N200 Latency



**Supplementary Figure 6.** Standard mean difference and pooled estimated of each study included in the meta-analyses of N200 elicited using an active two-tone oddball paradigm. A) comparing N200 latency between participants with Alzheimer's disease (AD) to participants with mild cognitive impairment (MCI), B) comparing N200 amplitude between participants AD to controls, and C) comparing N200 amplitude between MCI participants and controls. Summary includes: p = significance level;  $I^2 =$  percentage of heterogeneity; Q = Cochrane's Q. The horizontal lines represent the 95% confidence interval for each computed standard mean difference. Note: weights are from random effects analysis.

P300 Latency

Study name	Sample	size									
	AD patients	MCI patients						Std diff in means	Lower limit	Upper limit	Relative weight
Cintra et al. 2017	17	34		1	- <b>+</b> -			-0.05	-0.63	0.54	54.65
Lai et al. 2010	20	18			_ <b></b>			0.25	-0.39	0.89	45.35
Pooled	37	52			\$			0.09	-0.34	0.52	100%
(Summary: p = 0.69;	l² = 0.00%; Q	= 0.44, p = 0.51	-5.00	-2.50	0.00	2.50	5.00				
в											
				P300	0 Amplit	ude					
Study name	Samp	le size									
	AD patients	MCI patients						Std diff in means	Lower limit	Upper limit	Relative weight
Laietal. 2010	20	18			<b></b>			-0.02	-0.66	0.62	47.44
Papadanill et al. 2016	21	21						-0.05	-0.65	0.56	52.56
Pooled	41	39			$\Leftrightarrow$			-0.03	-0.47	0.40	100%
(Summary: $p = 0.88$ ; $l^2 = 0.00\%$ ; $Q = 0.00$ , $p = 0.96$ )		-5.00	-2.50	0.00	2.50	5.00					
с				P30	0 Amplit	ude					
Study name	San	nple size									
	MCI patients	Controls						Std diff in means	Lower limit	Upper limit	Relative weight
Bennyset al. 2011	71	31					1	-0.18	-0.60	0.25	29.43
Golobet al. 2001	15	12						-0.24	-1.00	0.52	9.06
Lai et al. 2010	18	14			- <b>-</b>			0.12		0.82	10.76
Levada et al. 2016	32	25						0.20	-0.32	0.73	19.11
Papadanill et al. 2016	21	21						-0.17	-0.78	0.44	14.31
Papaliagkas et al. 2011	22	30			- <b>P</b> -			0.12		0.67	17.34
Pooled	179	133			~ ^			-0.03	-0.25	0.20	100%
(Summary: $p = 0.83$ ; $l^2 = 0.00\%$ ; $Q = 2.17$ , $p = 0.82$ )		-5.00	-2.50	0.00	2.50	5.00					

**Supplementary Figure 7.** Standard mean difference and pooled estimated of each study included in the meta-analyses of P300 elicited using an active two-tone oddball paradigm. A) Comparing P300 latency between participants with Alzheimer's disease (AD) to participants with mild cognitive impairment (MCI), B) comparing P300 amplitude between participants with AD and participants with MCI, and C) comparing P300 amplitude between participants with MCI to controls. Summary includes: p = significance level;  $I^2 = \text{percentage of heterogeneity}$ ; Q = Cochrane's Q. The horizontal lines represent the 95% confidence interval for each computed standard mean difference. Note: weights are from random effects analysis.

Α