

Background

The medial frontal negativities (MFNs), error-related negativity (ERN) and No-Go N2, reflect electrocortical responses in the context of performance monitoring. In American undergraduate students, more liberal political orientations were associated with enhanced MFNs [1].

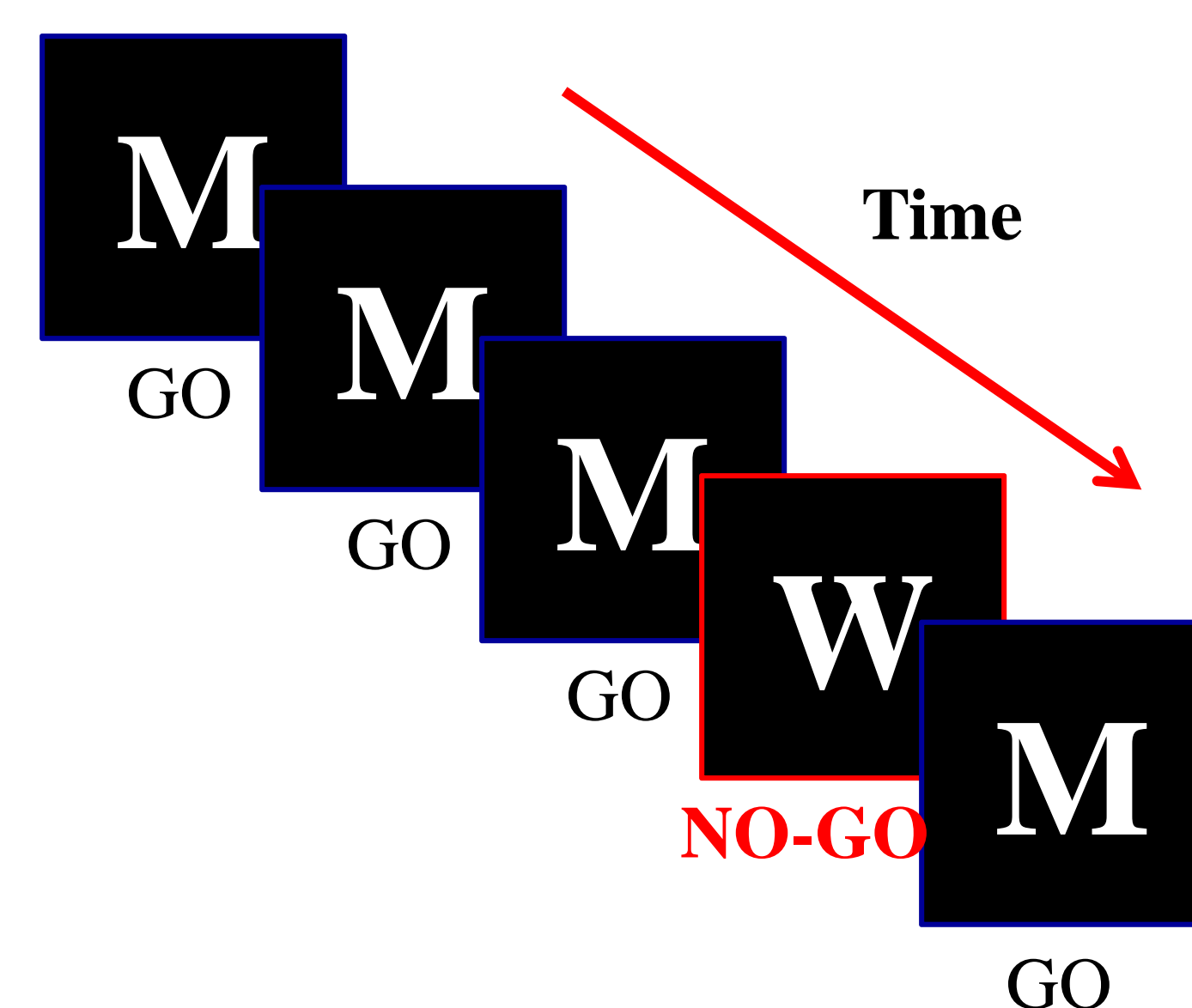
Although MFNs related to a liberal-to-conservative scale, an individual's global political orientation can also be conceptualized as multi-dimensional, composed of attitudes such as Egalitarianism and/or Right-Wing Authoritarianism (RWA). Thus, specific attitudes within political orientations might be uniquely related to MFNs.

Objectives: (1) To determine whether MFN amplitudes are associated with global political orientation in a Canadian sample; (2) To determine if more specific sociopolitical attitudes can be further differentiated on the basis of this electrocortical activity.

Hypotheses: (1) Liberal orientations and attitudes would be associated with greater ERN and N2 amplitudes. (2) Specific constituent attitudes of political orientation should account for unique variance in the amplitude of MFN components.

Go/No-Go Task

- Visual go/no-go task
- 2 letter stimuli (*M*, *W*) presented serially
- **Goal:** Respond (button press) as quickly/accurately as possible to frequently presented "Go" stimuli, withhold response to infrequent "No-Go" stimuli
- Target ("Go") stimuli counterbalanced across participants
- 600 trials (80% "Go" trials)



Method

Participants

- 34 Brock University undergraduates [2 M, 32 F; Age = 20.0 ± 4.0 years]

Political orientation/attitude measures

- Jost's "Political Self-identification" item [1, 2]
- Core measures of liberalism and conservatism:
 - Egalitarianism and Inegalitarianism Scale [3]
 - Right-wing Authoritarianism Scale [4]
- Other sociopolitical measures included Resistance to Change, Machiavellianism, Dogmatism, etc.

EEG recording and reduction

- Continuous EEG collected using 128-channel EGI system
- Offline 1-30 Hz bandpass filtered
- ERN: maximum negativity 30 to 160 ms following response ($M = 77$ ms)
- N2: maximum negativity 200 to 350 ms following stimulus onset ($M = 284$ ms)
- ERPs scored at frontocentral midline sites (Fz, FCz, Cz)

Results

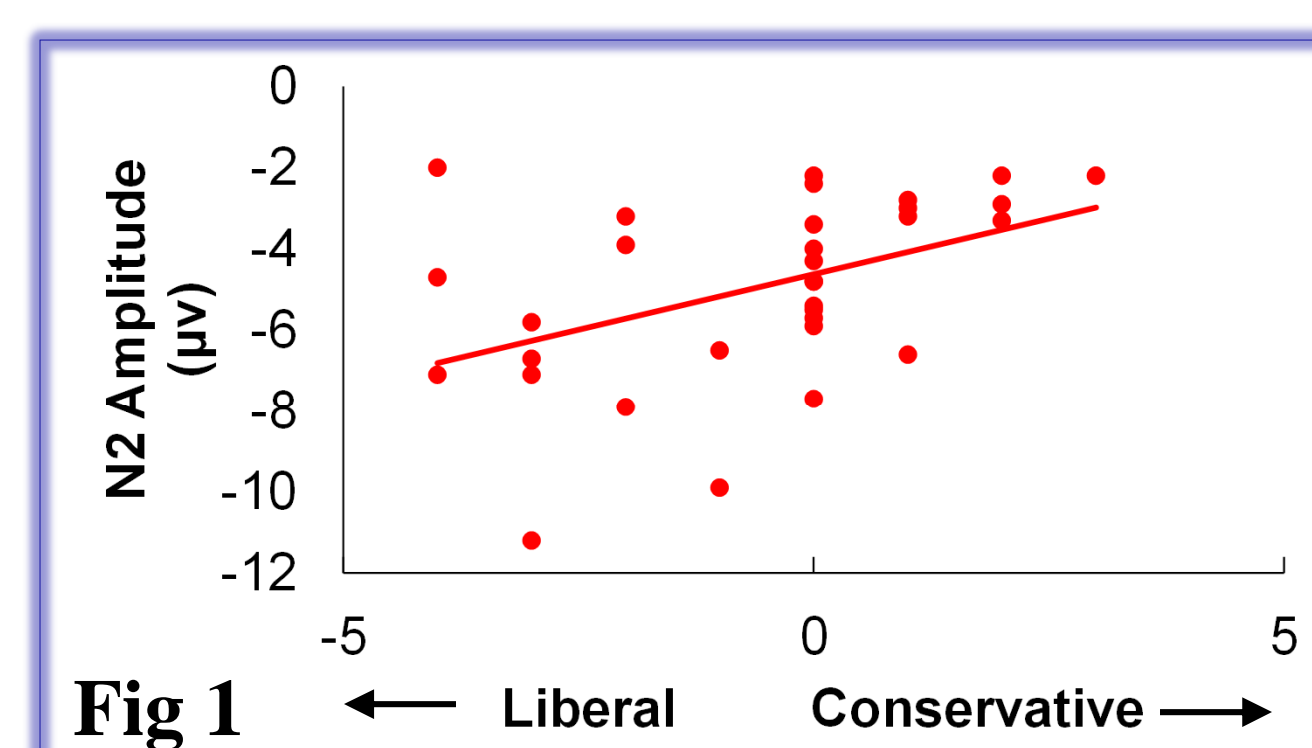


Fig 1

Political orientation (Jost Scale):

- Political orientation did not relate to the ERN amplitude, but did relate to N2 amplitude [$r = .45, p = .01$; Fig 1].

Zero-order correlations with ERN amp:

- Significant correlations with Egalitarianism [$r = -.43, p = .01$; Fig 2A] and RWA [$r = .36, p = .03$; Fig 2B].
- ▶ *More liberal orientations were associated with larger ERN amplitudes.*

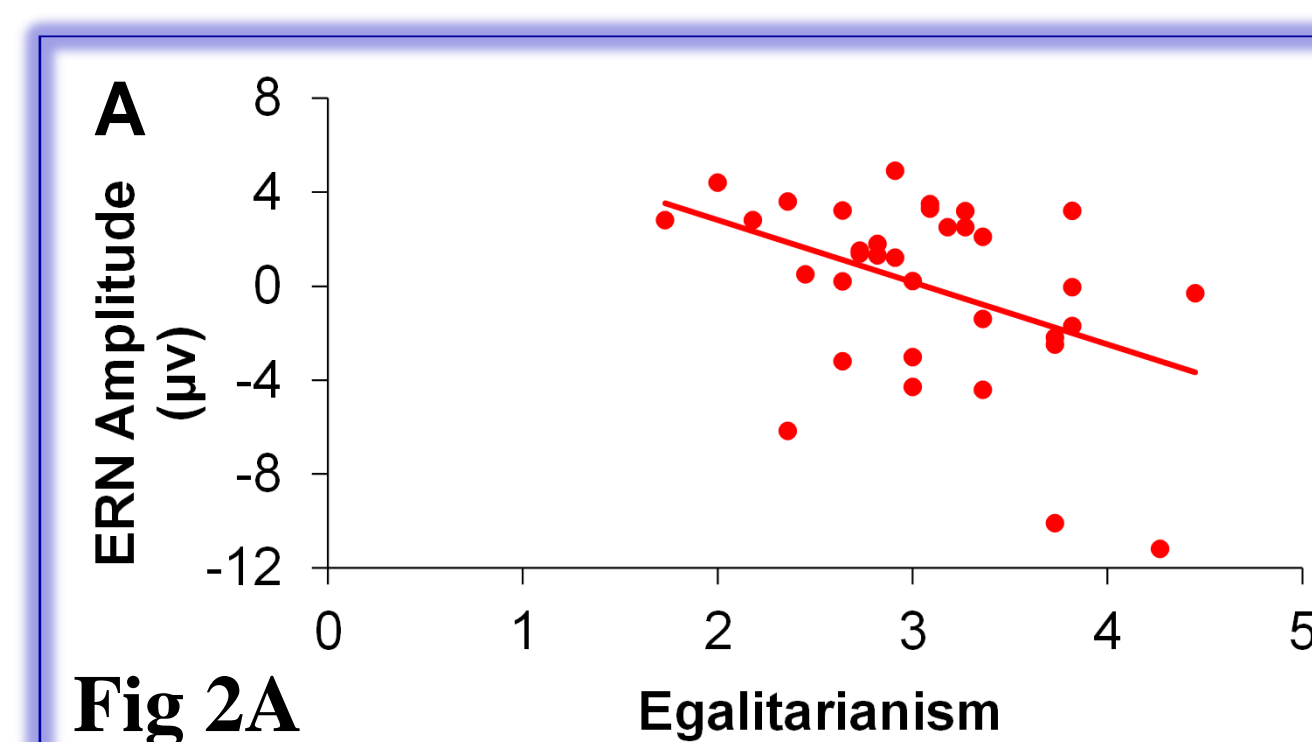


Fig 2A

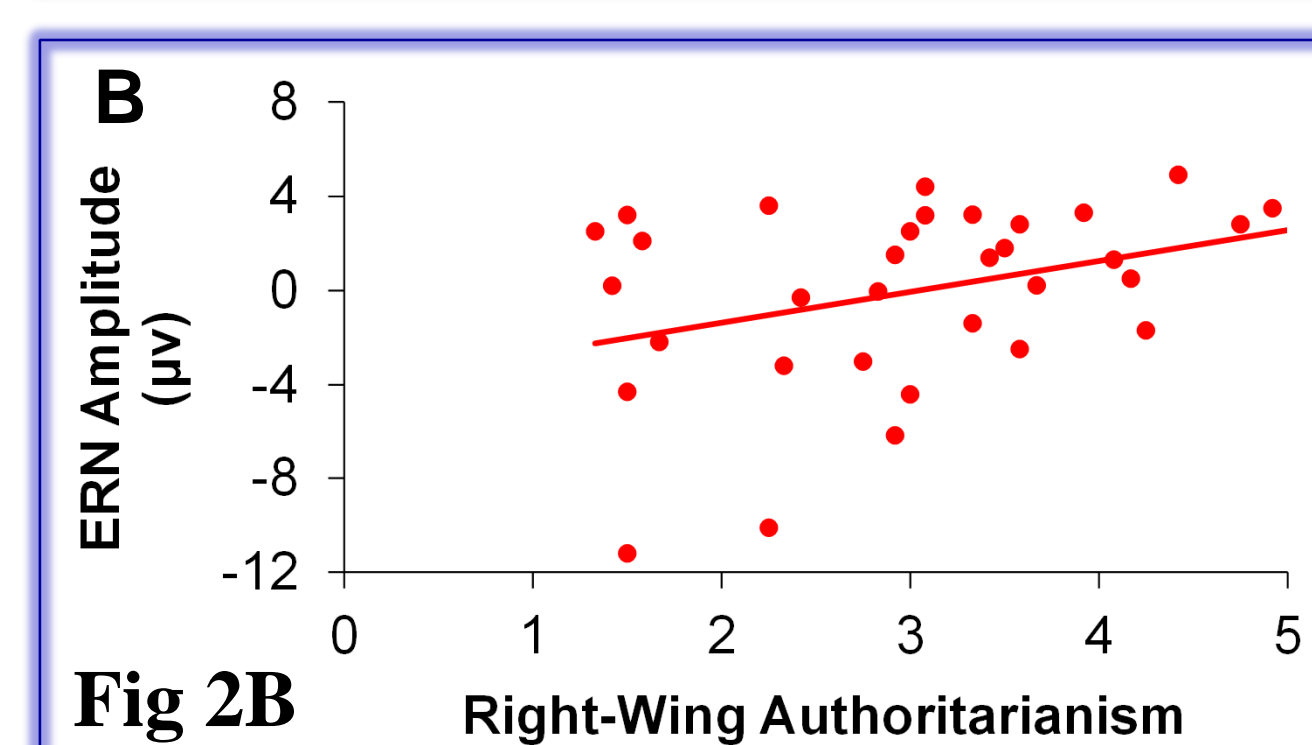


Fig 2B

Dependent Measure Relations:

Egalitarianism and RWA correlated [$r = -.34, p = .04$]. ERN and No-go N2 were positively correlated [$r = .50, p = .003$].

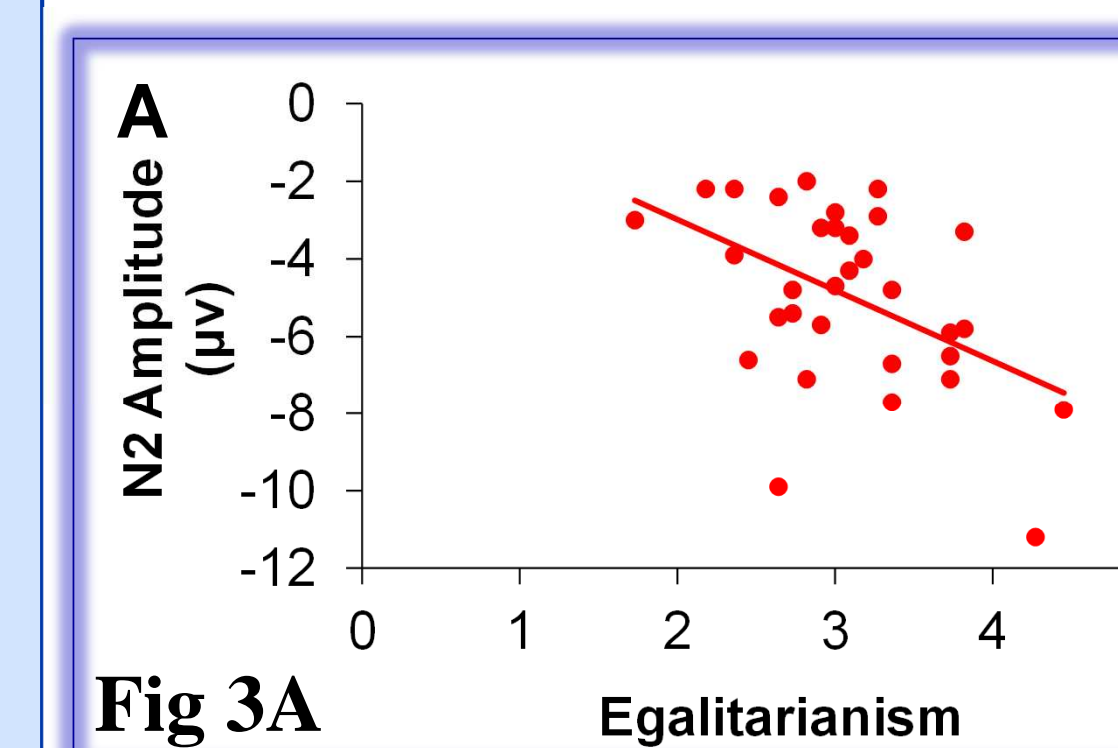


Fig 3A

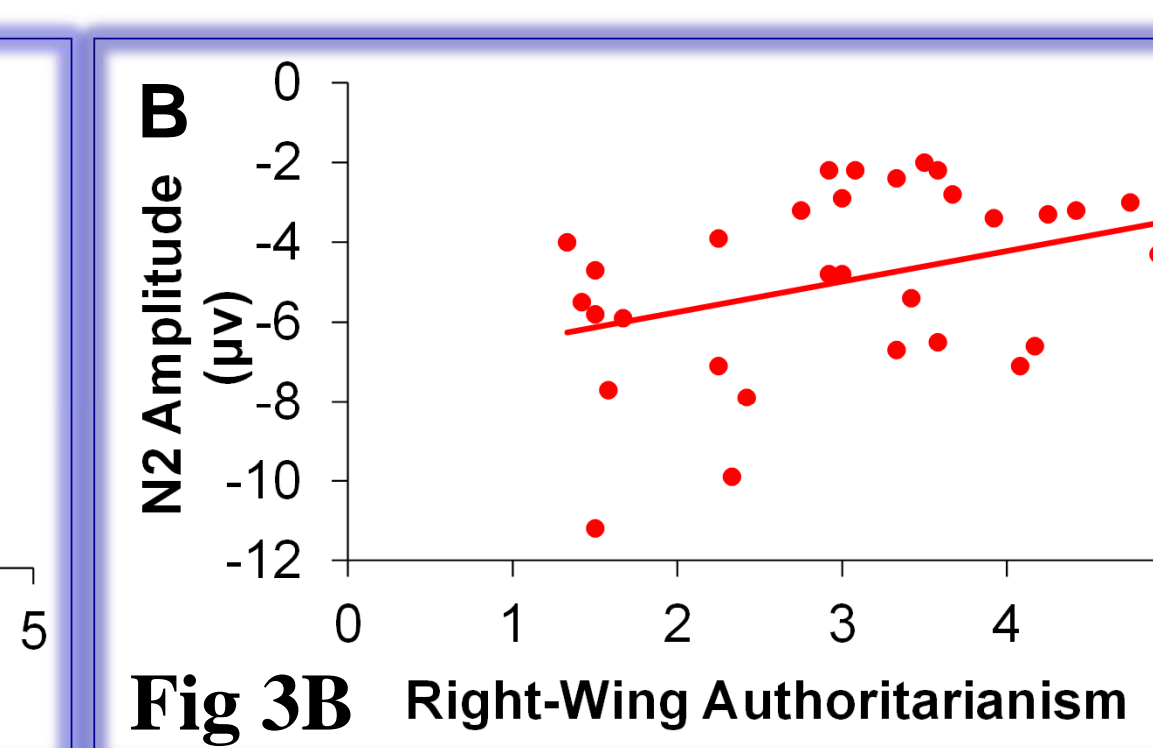


Fig 3B

Zero-order correlations with N2 amp: with Egalitarianism [$r = -.45, p = .006$; Fig 3A] and RWA [$r = .35, p = .04$; Fig 3B].
▶ *More liberal orientations on both scales are associated with greater no-go N2.*

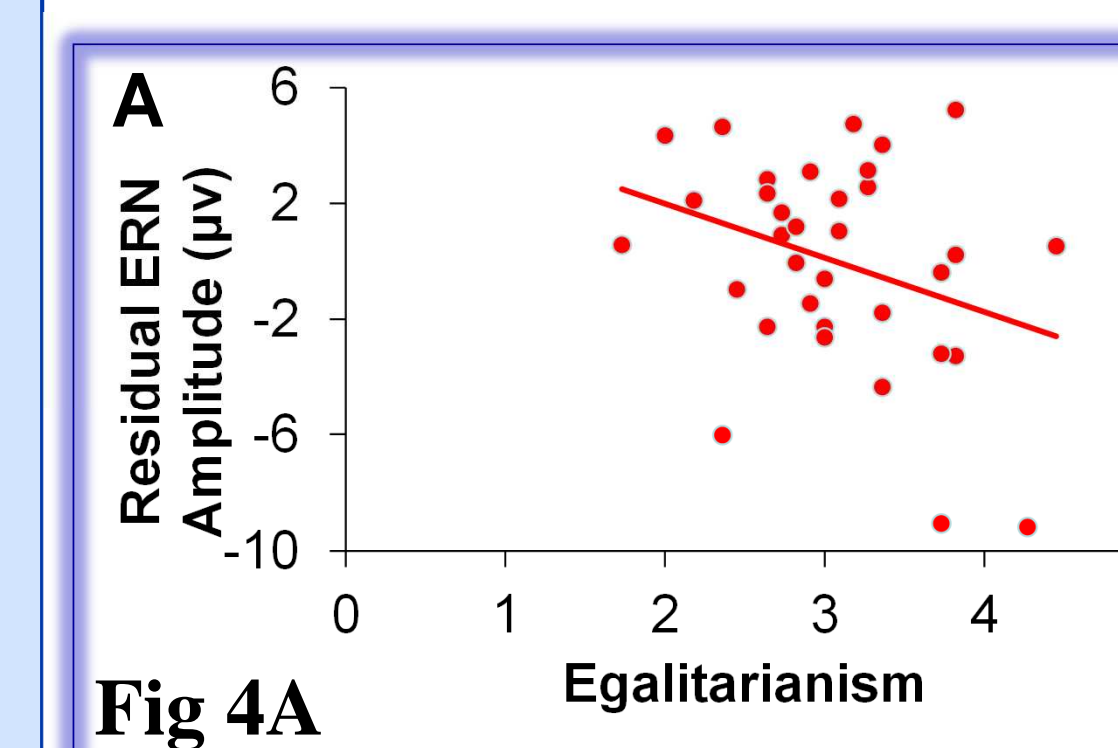


Fig 4A

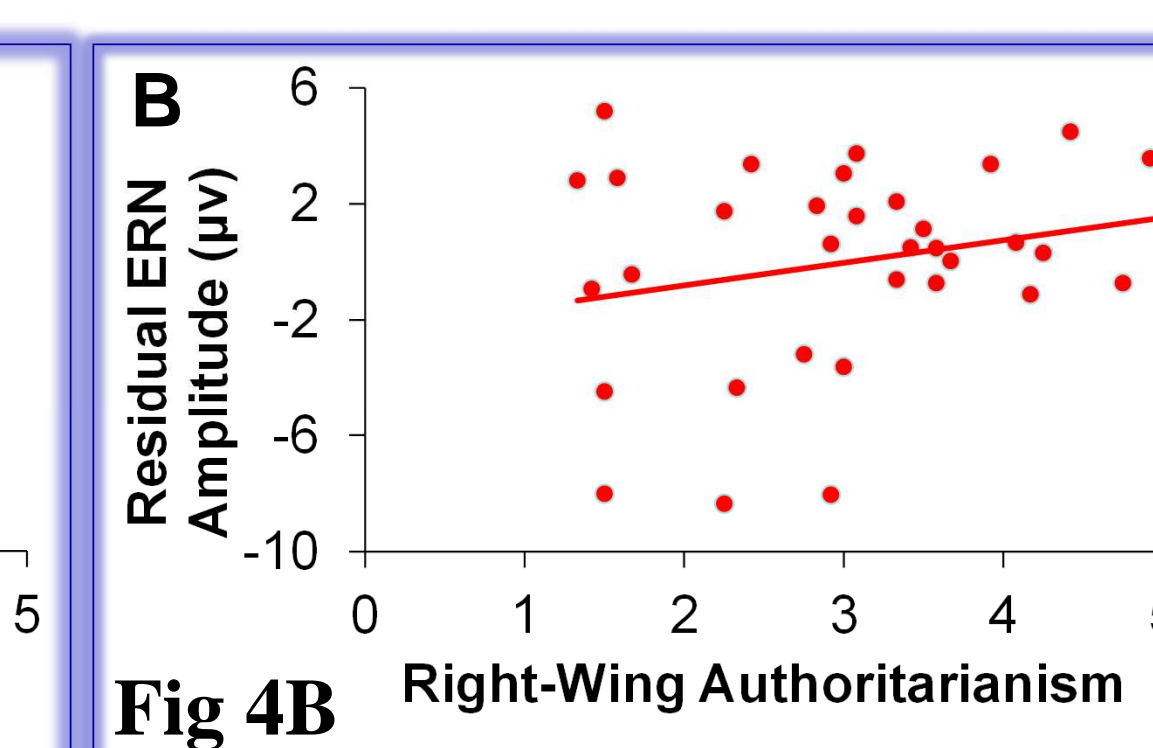


Fig 4B

Predicting ERN amp from RWA and Egalitarianism:

23% of ERN variance [$p = .016$] was accounted for by Egalitarianism and RWA, 10% of which was unique to Egalitarianism [$p = .05$; Fig 4A]. No unique variance attributable to RWA [$p = .15$; Fig 4B].

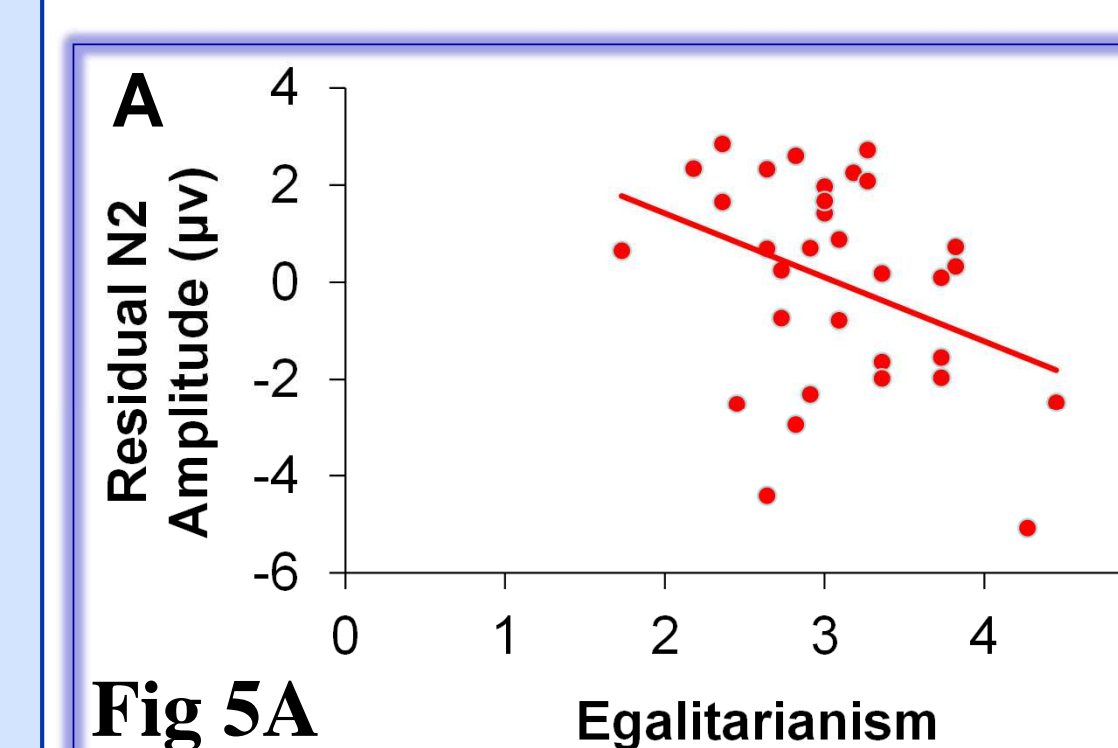


Fig 5A

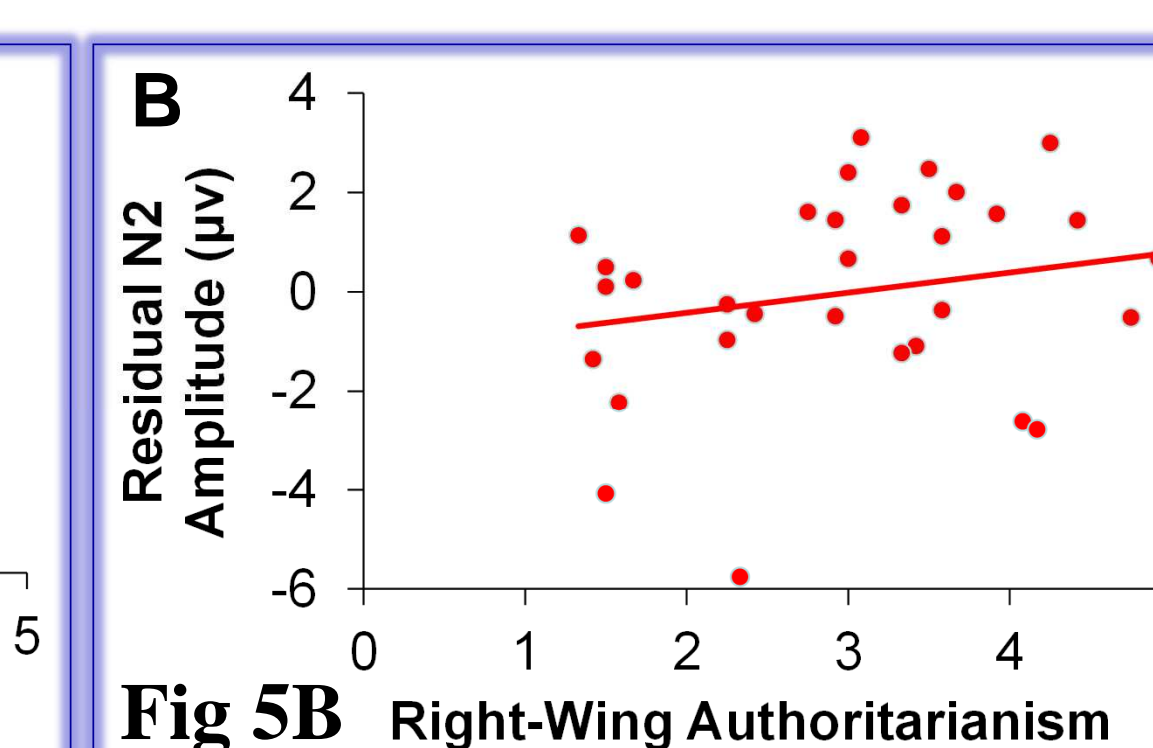


Fig 5B

Predicting N2 amp from RWA and Egalitarianism:

27% of N2 variance [$p = .01$] was accounted for by Egalitarianism and RWA, 13% of which was unique to Egalitarianism [$p = .03$; Fig 5A]. No unique variance attributable to RWA [$p = .20$; Fig 5B].

Conclusions

- **Partial support for association between MFN amplitudes and global political orientation in a Canadian sample, such that more liberal political orientations were associated with increased neural activation when successfully withholding of a prepotent response.**
- **Not only were the core orientations of Egalitarianism and RWA attitudes inversely related, but both were also related to both ERN and N2 amplitudes.**
- **Results support conceptualization of political orientation as a cluster of social attitude constructs, which can be differentiated by electrocortical correlates of performance monitoring.**

References

- [1] Amodio, D.M. et al. (2007). *Nature Neuroscience*, 10(10), 1246-1247.
- [2] Jost, J.T. (2006). *American Psychologist*, 61(7), 651-670.
- [3] Kluegel, J.R., & Smith, E.R. (1986). New Jersey: Transaction Publishers.
- [4] Altemeyer, B. (1998). *Advances in Experimental Psychology*, 30 (pp.47-92). San Diego: Academic Press