Background

The medial frontal negativities (MFNs), error-related negativity (ERN) and No-Go N2, reflect electrophysiological 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 specific sociopolitical attitudes can be further differentiated on the basis of this electrophysiological 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.

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

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.

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

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 associated with increased neural activation when successfully withholding of a prepotent response, 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 electrophysiological correlates of performance monitoring.

References

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