
Neurobiological mechanisms of social influence

Vasily Klucharev^{*†1}, Anna Shestakova², and Jörg Rieskamp¹

¹Department of Psychology (University of Basel) – University of Basel – Switzerland

²Saint Petersburg University – Russia

Abstract

Humans often change their beliefs or behavior due to the behavior or opinions of others. We explored, with the use of various neuroimaging methods (fMRI, TMS, ERPs), whether social conformity is based on a general performance-monitoring mechanism. We tested the hypothesis that conflicts with a normative group opinion evoke activity of the posterior medial frontal cortex often associated with performance monitoring and subsequent adjustment of behavior. Using fMRI we showed that conflicts with group opinion triggered a neuronal response in the medial frontal cortex. The amplitude of this conflict-related signal predicted subsequent conforming behavioral adjustments. We also demonstrated that the transient downregulation of the posterior medial frontal cortex by theta-burst transcranial magnetic stimulation reduced conformity. Finally, we tested the hypothesis that conflicts with a normative group opinion evoke a feedback-related negativity (FRN) often associated with performance monitoring and subsequent adjustment of behavior. Indeed, a mismatch between individual and group opinions triggered a frontocentral negative deflection with the maximum at 200 ms, similar to FRN. Overall a conflict with a normative group opinion triggered a cascade of neuronal responses: from an earlier FRN response reflecting a conflict with the normative opinion to a later ERP component (peaking at 380 ms) reflecting a long-lasting conforming behavioral adjustment. In general, our results support the hypothesis that some forms of social influence are mediated by activity of the posterior medial frontal cortex as a part of the general performance-monitoring circuitry.

*Speaker

†Corresponding author: vasily.klucharev@unibas.ch