

# Self-determination, self-regulation, and the brain

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## Self-Determination, Self-Regulation, and the Brain: Autonomy Improves Performance by Enhancing Neuroaffective Responsiveness to Self-Regulation Failure

The article above describes the research conducted by the authors; Lisa Legault and Michael Inzlicht (2013), in which they attempted to examine the role played by autonomy in self-regulation. According to the authors, although previous researches have shown that autonomy helps to improve regulation, there are no researches that attempt to describe this mechanism. No research has shown why autonomy helps to improve self-regulation. The authors hypothesized that trait autonomy would be directly related to task performance and reporting of brain-based errors. In addition, they hypothesized that error monitoring would be the connection between performance and autonomy. They also hypothesized that motivational quality determines the degree to which failure in self-regulation would be detected and thus performance enhanced.

In order to test their hypotheses, the authors undertook two studies in which they used the anterior cingulate cortex to assess the performance monitoring using two different tasks that need self-regulation. In the first study, 28 female and 15 male students from University of Toronto Scarborough took part where they were required to undertake a computer task and their brain activity recorded. The participants' ages ranged from 18 to 30 years. Three measures were taken. First, trait motivational orientation was measured which showed that individual differences in the motivational orientation based on the General Causality Orientation Scale (GCOS). This is comprised of 12 vignettes that help to describe different interpersonal

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scenarios. Second, the study measured the go/no-go task which was used as the indicator of self-regulation. Two stimuli were used; letter M for go and W for No-Go. It was required that participants press a button when the go stimulus appeared and not to press it when the no-go stimulus appeared. Finally, neurophysiological recordings were made based on the Electroencephalography (EEG) recordings made during the Go/No-Go task. The results of this first study showed that as autonomous motivation increased, performance and error related negativity (ERN) increased. ERN was thus correlated with various performance errors. Correct related negativity (CRN) was not related to performance and autonomy. Furthermore, the results revealed that autonomous motivation significantly relates to error processing and this helps to enhance self regulation. The second study was an extension of the first where the authors used experimental induction of autonomy to measure the effect of autonomous motivation on self regulation. The Stroop task was used to measure this effect. 29 male and 26 female undergraduates from the University of Toronto Scarborough aged between 18 and 30 took part. Two main measures were taken: Stroop task and general task motivation. The results of this second study showed that CRN was not related to autonomy. Manipulation of autonomy and control help to increase task motivation. Support for autonomy helped to reduce Stroop errors. Based on the findings of these two studies, the authors concluded that the quality, rather than the quantity, of motivation is important towards achieving self-regulatory success. These findings may thus be used to explain the effectiveness of the autonomous self regulation seen in different behaviors such as smoking cessation, food regulation and regulation of

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academic work among others. Secondly, the results show that noncoercion in action is very important and that self-determination plays an important role in enhancing performance and cognitive control. Therefore, effective control of behavior and optimal performance are enhanced when there is autonomy and the individual is not coerced.

#### Reference

Legault, L & Inzlicht, M (2013). Self-Determination, Self-Regulation, and the Brain: Autonomy Improves Performance by Enhancing Neuroaffective Responsiveness to Self-Regulation Failure. *Journal of Personality and Social Psychology*, 105(1), pp. 123-138