# Decreasing beliefs of intentional control affects neurocognitive markers of motor control

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**Abstract**

Motor control is a fundamental aspect of human behaviour, as it allows shaping our actions according to environmental demands. An important characteristic of motor control is the sensitivity to actions' consequences. For instance, performance errors can be detected in order to improve future performance. Reducing beliefs of intentional control - that is whether or not we can intentionally control our own actions - has important consequences for social behaviour, since it is known to lead people to go for more impulsive and automatic actions. In addition, it has been shown that it can affect brain correlates of intentional action preparation. The next question is then whether deceasing beliefs of intentional control can affect motor control processes. Here we show that decreasing beliefs of intentional control affects behavioural markers of motor control. More specifically, our results show that the post-error slowing - a behavioural indicator of motor control - is reduced when people are induced to disbelieve in intentional control. In a second study, high resolution EEG allowed to study the impact of belief manipulation on electrophysiological components related to motor control (response activation and inhibition, errors related components etc...). Taken together, the findings suggest that reducing beliefs of intentional control have an impact on motor control mechanisms.

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