

## **Do the Libet results generalize to deliberate decisions?**

Tension between more controlled and more generalizable tasks are not new in the Brain Sciences (e.g., Ebbinghaus vs. Bartlett in the psychology of memory). This tension is apparent also in the neuroscience of volition. The Libet and follow-up experiments are a case in point. These demonstrated that the readiness potential (RP)—a longstanding precursor of voluntary action—precedes subjects' reports of their decision to move. Some view this as evidence against a causal role for consciousness in human decision-making and thus as a challenge to free-will. Yet those studies focused on arbitrary decisions—purposeless, unreasoned, and without consequences—with an impoverished visual input. It consequently remained unknown to what degree those results generalized to deliberate, more ecological decisions.

We directly compared deliberate and arbitrary decision-making during a \$1000-donation task to non-profit organizations, reminiscent of neuroeconomics paradigms. While we found the expected RPs for arbitrary decisions, they were strikingly absent for deliberate ones. Our results, the many controls we ran, and our drift-diffusion model are congruent with the RP representing accumulation of noisy, random fluctuations that drive arbitrary—but not deliberate—decisions. They further point to different neural mechanisms underlying deliberate and arbitrary decisions. Thus, experiments relying on the Libet paradigm—while perhaps better controlled—may not generalize to real-life decisions. We argue that, at least for the study of high-level concepts like free will, sacrificing some control over our experimental conditions in favor much more generalizable results is defensible.