Movement suppression: brain mechanisms for stopping and stillness

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Most of those who study the mechanisms in the brain that control movement tend to concentrate on the movements themselves, which is understandable enough. But in fact most of the time our limbs and bodies are not moving at all, but keeping still. We are so used to this that we take it for granted, but one only has to look at the birds on one’s lawn to be aware of the continual alternation between rapid movement and long periods of ‘freezing’, a pattern that is a universal feature throughout the animal kingdom.

Keeping still is itself a challenging problem for the motor system, and certainly not just a matter of turning muscles off. This theme issue focuses on what is known of stopping and keeping still, from behavioural, neurophysiological and comparative perspectives, ranging from neuronal recordings in animals during stop tasks to quantitative computational models of the behaviour, providing an opportunity to tie these different approaches together, and place them in the more general context of previous studies [1]. We would like to encourage research in an area that promises to provide both insights into the brain mechanisms concerned—in particular on that very dark area, the basal ganglia—and also clinical benefits in terms of improved differential diagnosis in certain neural disorders, more precise monitoring of disease progression, and evaluation of the success of therapeutic procedures. We hope, therefore, that it will be of interest to a wide range of readers, and is very much non-bandwagon. It deals with a kind of ‘elephant in the room’ as far as understanding the motor system is concerned—inexplicably overlooked—so we hope the wide readership of Philosophical Transactions will find it stimulating; if this theme issue can excite an interest in looking at the motor system from this relatively novel perspective, that would be very much to be welcomed.

A mark of the potential value and appeal of this theme issue has been the extraordinary enthusiasm of our contributors, which has been both encouraging and stimulating; like us, they see it as a pre-eminently timely initiative in a much neglected area. We would like to express our warmest thanks to all of them, as also to the Senior Editor at Philosophical Transactions, Helen Eaton, for her unfailing help and patience.

Reference


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