

## The brain as a tool: a neuroscientist's account

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### Abstrak

We don't perceive the world and then react to it. We learn to know it from our interactions with it. All inputs that reach the cerebral cortex about events in the brain, the body, or the world bring two messages: one is about these events, the other, travelling along a branch of that input, is an instruction already on its way to execution. This second message, not a part of standard textbook teaching, allows us to anticipate our actions, distinguishing them from the actions of others, and thus providing a clear sense of self. The mammalian brain has a hierarchy of cortical areas, where higher areas monitor actions of lower areas, and each area can modify actions to be executed by the phylogenetically older brain parts. Brains of our pre-mammalian ancestors lacked this hierarchy, but their descendants are still strikingly capable of movement control: frogs can catch flies. The cortical hierarchy itself appears to establish and increase, from lower to higher levels, our conscious access to events. This book explores the neural connections that provide us with a sense of self and generate our conscious experiences. It reveals how much yet needs to be learnt about the relevant neural pathways.