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The neurophilosophy of epileptic experiences

Monaco F, Mula M, Cavanna AE. The neurophilosophy of epileptic experiences.

Background: Specific alterations of consciousness have a central role in the phenomenological description of epileptic seizures and in the patient's subjective reports.
Methods: This article discusses the use of philosophical methodology within a neurological framework to understand consciousness.
Results: How the alterations in consciousness are experienced by patients with epilepsy depends largely on the localization of the underlying neurophysiological dysfuntion.
Discussion: Rigorous conceptual analysis of ictal experience reports can help to illuminate the study of consciousness.

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I felt the sky falling down on earth
- and then it swallowed me

Winter 1865

Fjodor Dostoevskij's description of his first seizure to Anna Korvin Krukovskaia and her sister Sonja

Introduction

The alterations of consciousness occurring in patients with epilepsy during complex partial seizures (CPS) are among the most fascinating and intriguing experiential phenomena of human beings, and their understanding may shed some light on the basic mechanisms of the functioning of mind. Arguably, CPS represent the quintessential example of impairment of the 'self' during the waking state, in contrast to sleep-related behavioural disorders, in which the 'self', by definition, is *per se* already absent. To date, self-reports of altered conscious states during seizures are the only first-person perspective data available for scientific analysis, despite the possible presence of memory-related bias (1). It has therefore been suggested that further insights into consciousness, even those bordering on the neurophilosophical, may be reached by the exploration of clinical neurological phenomena, such as epileptic seizures, using emerging neuroinvestigative techniques (2).

Methods

Neurophilosophy, sometimes referred to as philosophy of neuroscience, is the interdisciplinary study of neuroscience and philosophy. The aims of neurophilosophy are two-fold: on the one hand, neurophilosophy attempts to solve problems in philosophy of mind using empirical information from the neurosciences; on the other hand, it clarifies neuroscientific results using the methodology and conceptual rigour of analytic philosophy of mind (3,4). The understanding of ictal phenomenology of different types of epilepsy is *de facto* shown to highlight certain neuroanatomical and neurophysiological facets of consciousness (5,6), but these findings pertain mainly to the domain of neurophysiology, whereas a strong effort seems mandatory to systematically investigate the subjective experiences of patients during CPS. This is in agreement with the assumption that any strategy used to explain consciousness that omits its subjective nature begs the question (7).

For this purpose, philosophers of mind use the technical term of 'qualia' (singular: 'quale') to refer to the subjective texture of experience, which is the essence of the qualitative dimension of consciousness. The concept was first defined by

C. I. Lewis (8) as the qualitative characters of 'the given', the given to be understood as a presentation of something, and the quale as a qualitative character of this presentation. In his view, qualia are the elementary levels of experience, so they cannot be analysed any further. Qualia are ineffable (not linguistically describable), atomic and unanalysable properties of experience. A number of other different terms are being used to refer to qualia: subjective or qualitative characters of experience, raw feelings, what-is-it-like, qualitative consciousness, primary consciousness, phenomenal consciousness and so on. Stubenberg epitomises the fundamental facts of such subjective sphere of experience in the statement: 'Without my qualia I am, as far as I am concerned, dead' (9). However, the status of qualia is hotly debated in both philosophy (10) and neuroscience (11), largely because it is central to a proper understanding of the nature of consciousness. Specifically, the current focus of the debate on qualia is about the identification of neurobiological correlates for these experiential phenomena, which would in turn reinforce the assumptions about their ontological status (11).

Results

As clinical neurologists, we cannot enter the belligerent arena of this never-ending debate. Nevertheless, we believe that it would be practically useful to introduce a neurophilosophical terminology to describe the experiential phenomena within the context of epileptic seizures, with the assumption that this approach will help analysing and understanding the subjective experiences of patients. Moreover, we argue that detailed investigations of neural processes taking place in mesolimbic structures during CPS will result in precious insights into the ultimate search for the neural correlates of qualia (12). This hypothesis is based on the previous reports of epileptic qualia in patients with temporal lobe epilepsy (13), although it cannot be excluded that extratemporal activity can be involved in the generation of these subjective experiences.

In 2001, the ILAE Task Force on Epilepsy Classification proposed a diagnostic scheme that replaced the distinction between simple partial seizures and CPS with one between focal sensory seizures with elementary symptoms and focal sensory seizures with experiential symptoms (14). Despite these efforts, ambiguities persist and the assessment is usually left to the observer's subjective interpretation and personal vocabulary. In our opinion, the representation through a bidimensional model of consciousness (levels vs. contents) helps dissecting the exact nature of the impairment of consciousness, leading to a clear-cut differentiation between seizures that primarily affect the level of awareness (generalised seizures) and seizures that specifically alter the subjective contents of consciousness (focal seizures) (15,16). Such a model relies on clinical, neurophysiological and functional imaging findings, because the biaxial pattern reflects different neural mechanisms underlying the level and content of consciousness. Impairment of the general level of awareness seems to be related to the involvement of subcortical structures (17), thus leading to transient disruption of frontoparietal and midline (precuneus/posterior cingulate cortex) associative networks, according to the 'default mode' of brain function theory (18). On the other hand, the qualitative features of experiential phenomena (the 'epileptic qualia') are the expression of the activity of limbic components of the temporal lobe (1,5,19).

An 'epileptic quale' is a specific experiential event created in the patient's mind, a phenomenon not exactly identifiable and hardly explainable: that is why it is often defined as a 'twilight' or a 'crepuscular' state. A wide range of dissociative experiences occurring as part of the epileptic aura, such as 'déjà vu' and 'dreamy state' experiences, are to be included in the catalogue of 'epileptic qualia' (20). Thus, the concept of 'qualia' seems appropriate as it denotes what would otherwise remain elusive, transforming a vague subjective experience into a neurophilosophical construct liable to quantification through a scale of subjective intensity (vividness). In this context, psychometric instruments such as the Ictal Consciousness Inventory (15) can prove useful in fulfilling the two-fold aims of neurophilosophy, in translating the relevance of the findings from neuroscientific studies to arguments in philosophy of mind and informing empirical research with the analytical rigour of philosophical concepts (qualia).

From a clinical perspective, understanding the specific nature of how the level and contents of consciousness are changed in a given patient can prove useful in assisting the differential diagnosis between different types of epilepsy (15). Moreover, preliminary findings have highlightened the need for further research on the potential usefulness of the systematic assessment of the ictal alterations in the level and contents of consciousness for the differential diagnosis between epilepsy and non-epileptic attacks disorder (21). From a theoretical perspective, epileptic qualia can provide us with one of the keys to understand the concept of 'philosophical zombies'. Within this operational framework, the term 'zombie' identifies a being whose behaviour is utterly indistinguishable from that of

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normal humans, but who has no 'inner life' at all. In other words, philosophical zombies lack phenomenal qualia, and therefore do not experience subjective feelings (22). C. Koch and F. Crick named 'zombie modes' the seemingly automatic activities occurring during psychomotor seizures in limbic status epilepticus (23). More recently, A. Revonsuo further analyses this concept by distinguishing 'weak' and 'strong' zombiehood: weak zombies are persons who are unconscious but can only carry out routine action programmes, whereas strong zombies are persons who can carry out non-routine tasks involving new decisions and semantic processing (24). Patients with psychomotor seizures could therefore be defined as weak zombies, i.e. not completely devoid of consciousness, as far as automatic behaviour is concerned. This resembles the clinical picture described by W. Penfield as the 'mindless automaton' as early as in 1975 (25).

Discussion

Philosophy of mind is not the only theoretical discipline involved in a fruitful dialogue with the neurosciences. A further method for the description and characterisation of the epileptic qualia is the classical psychopathological approach of phenomenology. Phenomenological analysis (the conceptually rigorous analysis of everyday experiences as they appear to consciousness) has long been used to understand how psychiatric patients attribute meaning to experiential appearances. More recently, the discipline of neurophenomenology has skilfully combined the conceptual tools of phenomenological analysis with the neuroscientific research paradigm. Specifically, neurophenomenologists have an in-depth understanding about phenomenological philosophy (that helps them better understand the biological basis of mental phenomena), coupled with a solid neurobiological background knowledge (that helps them better understand the phenomenological analysis of experience) (26,27).

The scientific offensive in the investigation of consciousness, although seemingly desperate, must go on, and some illuminating insights may well be provided by the integration of neurobiological findings and neurophilosophical approaches. Altogether, the few studies taking into account this kind of essential integration, show that epilepsy, the 'quintessential' pathology of consciousness (28,29), represents a privileged window for the observation and hence (who knows?) the solution of the millennial conundrum of the self.

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