



# Introduction: Mind and Brain

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In March 2016, we hosted an event at the New College of the Humanities to celebrate the works of Daniel Dennett and Nicholas Humphrey, two scholars who have a strong affiliation with our institution and who had recently won the Mind and Brain Prize recognising ‘outstanding achievement... in the field of cognitive science’. In addition to talks from Dan and Nick, the audience had the pleasure of listening to a number of contributed talks that complemented each other and engaged with the work of our esteemed keynotes. As the event was a resounding success, we reached an agreement with Topoi to publish a collection of peer-reviewed essays from the conference as well as from a separate call for papers. The result is the current special issue which covers a wide range of topics that we hope are of interest to researchers in philosophy, cognitive science and beyond. It includes contributions by (in alphabetical order): Victor Fernandez Castro, Daniel Dennett, Markus I. Eronen, Francis Fallon, Raoul Gervais, Valerie Gray Hardcastle, Nicholas Humphrey, Dimitri Coelho Mollo, Charles Rathkopf, Miguel Angel Sebastián and Marc Artiga. In what follows, we offer short summaries of these contributions, beginning with the papers of our keynotes and proceeding according to topics.

Daniel Dennett begins his piece by noting that some authors who offer a history of God are ambivalent about His existence. By contrast, he wants to be unequivocal in his repudiation of qualia: otherwise, he thinks, we risk ‘missing an opportunity to make real progress on consciousness’. The belief in qualia, he argues, arises from a confusion of the intentional objects of our mental states with their proximal causes (which are in fact neural events): yet we are authoritative about the features of the former (at least in cases of e.g. hallucination, when they don’t exist), but do not have privileged access to the latter (which always do); and indeed, Dennett suggests that rejecting this identification is

‘the heart of [his preferred] Illusionism’ about consciousness. Dennett also contends that Nick Humphrey, a fellow Illusionist with whom he largely agrees, ‘court[s] misunderstanding by being overly diplomatic’ in his own piece in this special issue. For instance, sensations are genuine causes: but Humphrey claims we ‘project *the special qualities of sensations*’—‘my emphasis’, says Dennett—‘out onto the objects of perception’ thereby enchanting the outside world; whereas Dennett thinks ‘our sensations (considered as events in our brains) are better seen as *representing*, not *having*, special qualities’—namely, Gibsonian affordances of worldly things, which, like Locke’s secondary qualities, are defined by their relations to our minds. Thus, we need not be concerned that in repudiating qualia we are denying the existence of such ‘lovely’ features as colours and aromas.

In his contribution, Nicholas Humphrey also wants to throw light on human consciousness. Non-phenomenal or higher-level aspects of consciousness, he argues, have evolved to be of practical use by helping us plan and make decisions as well as explain our mind and the minds of others. Phenomenal or lower-level aspects of consciousness, he concedes, are more mysterious. Still, Humphrey doesn’t give up hope that science will one day explain them. In fact, he conjectures, through a series of metaphors and analogies—e.g. the illusion of a pilot in a completely automated cockpit—that the brain has evolved a special kind of inward looking feedback loop that we inadvertently interpret as the seemingly ineffable qualia. Why has evolution created such an illusion? In contrast to Fodor and Searle, Humphrey dares to say that qualia have a function to play. They make us ‘bigger on the inside’, and in so doing, the suggestion goes, aid in our survival.

Continuing with the consciousness theme, Valerie Hardcastle questions the view championed by the embodied cognition movement: that consciousness and cognition are one and the same thing and that this neutral monism has the power to sidestep the ‘hard problem’. Embodied cognition, introduced by Gibson and championed by Varela, highlights the origins of the body and mind as adaptive systems tuned to exist in their environment. Hardcastle takes the view that

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more work needs to be done to equate consciousness and cognition, drawing on evidence from neuroscience to argue that the embodied cognition approach does not explain why it is like something to be an agent. She shows that cleaving too closely to embodied cognition may imply having to cast simpler organisms like flies (or parts of brains) as individually conscious, highlighting the philosophical consequences of the radical version of this view.

When discussing consciousness, Dennett has admitted to avoiding ontological questions, leaving his position on realism unclear. While Nagel accuses his account of insufficient realism, Schwitzgebel considers it too realist. Francis Fallon's paper evaluates these views by interpreting Dennett's book *From Bacteria to Bach and Back* (2017) in the context of everyday observations. For example, the report 'I see a red stripe' is unclear about whether the stripe is a real-world object or a mental object. Fallon argues that Dennett deploys a particular form of realism which leverages the distinctions between reporting and expressing, between cause and effect, and between the inner and outer worlds. Once we accept that many useful concepts (such as quarks) are described by their effects and can thus be seen as forms of fiction, this form of realism, according to Fallon, is well-suited for engaging with real life.

Markus Eronen discusses Dennett's theory of intentional stance, especially as this pertains to the nature of intentional states like beliefs and desires. As is well known, this theory is an attempt to find middle ground between (a strong form of) realism and instrumentalism. Assuming the intentional stance means treating any object with predictable behaviour as a rational agent with intentional states and, by extension, endorsing such states as real. At the same time, Dennett disavows the brain-like, and even physical-like, nature of intentional states, a clear concession to instrumentalists. The trouble with this theory is that the realistic credentials of intentional states are called into question precisely because of this lack of causal efficacy. Objections of this sort have forced Dennett to admit that some causal role must be given to intentional states. Eronen employs the interventionist account of causation to analyse this role. On this account, intentional states would be real causes if we could systematically intervene on such states to bring about systematic changes in behaviour. The ontological upshot of this approach is that one can uphold the realistic credentials of intentional states without assuming that they are brain states, as no such constraint, Eronen argues, is imposed by interventionist accounts of causation. The plausibility and coherence of this view is defended against a number of objections, including concerns that the resulting form of realism is too strong or (contrarily) too weak and concerns arising from the causal exclusion argument.

Another contribution that deals with the intentional stance is that offered by Victor Fernandez Castro. Folk psychology

is the human capacity to explain and predict the actions of other people, as well as the lay vocabulary used to describe their mental states. The 'regulative view' of folk psychology argues that these processes also regulate our behaviour, keeping it in line with social norms. Dennett's conception of the intentional stance can be equated with the regulative view, since it focuses on the relationship between behaviour and intentional states. Here, Castro exercises several arguments which work against the intentional stance: that it does not have the power to correctly predict intentions and desires, that it does not explain incorrect predictions made by folk psychology, and that the intentional stance does not come with a mechanistic explanation for its predictions. Emphasising the key similarity between folk psychology and the intentional stance—that explanation and prediction of others' behaviour relies on normative standards—Castro shows that these arguments do not have convincing power to work against the regulative view of folk psychology.

The theme of mechanistic explanations plays a central role in Raul Gervais' contribution. Gervais argues that existing discussions of how one may proceed to discover mechanisms and, more particularly, evaluate competing mechanistic hypotheses have focused on two types of reasoning, experimental and constraint-based. He proposes performance-similarity as an important type of reasoning, some of whose instances may be distinct from the other two types. Simply put, performance-similarity reasoning uses the similarity (or dissimilarity) in performance between the capacities of two systems as evidence for the similarity (or dissimilarity) between the mechanisms underlying them and vice versa. Gervais identifies such reasoning as a species of inference to the best explanation. In more detail, he identifies two sub-types of performance-similarity reasoning. One of them compares not just similarity in performance but, more specifically, the level of that performance as measured, for example, by speed and accuracy. The other, even more specific than the first, demands also that such similarity in performance remains invariant under intervention. The paper concludes with some useful examples of both types of inferences in areas where Dennett has made contributions, e.g. the debate between the connectionists and the classical computational theorists of mind.

Miguel Angel Sebastián and Marc Artiga note that mainstream cognitive science posits internal representations to explain cognition and accordingly needs a naturalistic theory of content possession and determination. Informational theories of content appeal to statistical correlations to provide this: recent such theories (RITs) overcome the problems faced by Dretske's pioneering approach; yet Sebastián and Artiga argue that they encounter problems of their own. In particular, metarepresentations allow subjects to represent their own mental states, and may be involved in the representation of other minds and/or in consciousness; but RITs

cannot distinguish them from first-order representations of external stimuli. For instance, on Usher's view, a representation  $R$  of a state  $S$  raises the probability of  $S$  above that of all other states and its probability in turn is raised by  $S$  more than any other representation is. Sebastián and Artiga argue, however, that both of these conditions can be met by some external stimulus when intuitively we have a metarepresentation of some internal state and vice versa. They then generalize their argument to other RITs, rebut rejoinders, and argue that appeals to teleological function risk replacing rather than supplementing such theories. They conclude by distinguishing their objection from the indeterminacy and distality problems and emphasizing its severity.

Staying with the theme of information, the contribution by Charles Rathkopf addresses the question of what kind of information is processed by the brain. The dominant view amongst philosophers has been that two different kinds of information characterise what happens in the brain. At the neuronal level, one needs to employ a quantitative notion of information, notably Shannon information, while at higher levels of organisation one may also be able to employ qualitative notions of information, notably semantic information. Rathkopf rejects this dual-level view arguing that there are significant connections between semantic and Shannon information. In more detail, he argues against the interpretation of neurons carrying Shannon information as simply a matter of there being a correlation between them because this is an extremely permissive view. He also counsels against the reification of this kind of information. On his view, neural information rates must be sensitive to the functional specificities, particularly the biological function, of the sending and receiving mechanisms. The Shannon-information properties of neurons, he conjectures, have evolved to increase the efficiency of semantic information processing at higher levels of organisation. In this sense, then, the two notions of information are thought to be inextricably linked.

Finally, Dimitri Coelho Mollo defends what he calls 'content pragmatism' (CP) against a number of objections, arguing not that it is true, but only that it is a coherent alternative to various rivals. CP is the view, developed by Egan, that the notions of representation and content play an ineliminable role in the cognitive sciences, but only as parts of an explanatory gloss that connects computational systems individuated in terms of the mathematical functions they compute to behavioural success in cognitive tasks defined by distal stimuli. Bechtel has argued that CP is descriptively inadequate, since cognitive science often seeks, and has sometimes found, neural implementations of representational states it has discovered. But Coelho Mollo suggests, following Ramsey, that much of the initial talk of representations might turn out, on closer examination, to be replaceable by talk of causal relays, so that it is ultimately of merely heuristic value. Neander worries that CP collapses into primitivism: for it explains representation and content at the sub-personal level only by taking the intentional content of the propositional attitudes as given. Yet Coelho Mollo contends that intentional content might be explained, and without embracing a robust realism (RR) on which representation consists in some natural relation—appeal to Dennett's intentional stance might suffice. Four arguments are then considered which aim to show that CP collapses into RR. In the sophisticated discussion that ensues it is argued that the content pragmatist can refrain from embracing an ontologically committing notion of representation even if that notion proves essential to cognitive science.

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