

Neurophenomenology and Contemplative Experience

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Introduction

Scientific investigation of the mind, known since the nineteen-seventies as ‘cognitive science’, is an interdisciplinary field of research comprising psychology, neuroscience, linguistics, computer science, artificial intelligence, and philosophy of mind. The presence of philosophy in this list is telling. Cognitive science, although institutionally well established, is not a theoretically settled field, unlike molecular biology or high-energy physics. Rather, it includes a variety of competing research programmes - the computational theory of mind (also known as classical cognitive science), connectionism, and dynamical and embodied approaches - whose underlying conceptions of mentality and its relation to biology, on the one hand, and to culture, on the other, are often strikingly different (see Clark, 2001, for a useful overview).

It is important to keep this situation in mind in any discussion of the relation between cognitive science and religion, for different theoretical perspectives in cognitive science can combine with different scientific approaches to religion. Rather than review these possibilities here, however, I shall describe one recent approach, known as neurophenomenology (Lutz and Thompson, 2003; Varela, 1996). Although neurophenomenology is not directly concerned with the cognitive science of religion, it is highly relevant to this field, especially the psychology and biology of religious experience.

Neurophenomenology is an offshoot of the embodied approach in cognitive science (Varela, Thompson, and Rosch, 1991). The central idea of the embodied approach is that cognition is the exercise of skillful know-how in situated action. The most important feature of this approach is that experience is not seen as an epiphenomenon, but is considered central to any adequate understanding of the mind, and accordingly needs to be investigated in a careful phenomenological manner. Phenomenology and experimental cognitive science are thus seen as complementary and mutually informing modes of investigation. Neurophenomenology builds on this view with the specific aim of understanding the nature of consciousness and subjectivity, and their relation to the brain and body.

The working hypothesis of neurophenomenology is that phenomenological accounts of the structure of human experience and scientific accounts of cognitive processes can be mutually informative and enriching (Thompson 2006; Varela, Thompson, and Rosch, 1991; Varela, 1996). The term ‘phenomenology’ in this context refers to disciplined, first-person ways of investigating and analyzing experience, as exemplified by the Western philosophical tradition of Phenomenology (Moran, 2000) and Asian contemplative philosophies, especially (though not exclusively) Buddhism. The reason the Buddhist tradition is particularly relevant in this context is that its cornerstone is contemplative mental training and critical phenomenological and philosophical analysis of the mind based on such training (Dreyfus and Thompson, in press; Lutz, Dunne, and Davidson, in press). Thus, neurophenomenology intersects with religion not so much as an object of scientific study, as it is for the cognitive science of religious beliefs and behaviours (e.g., Boyer, 2001, 2003, 2005), but rather as a repository of contemplative and phenomenological expertise. According to neurophenomenology, such expertise could play an

active and creative role in the scientific investigation of consciousness (Lutz, Dunne, and Davidson, in press; Lutz and Thompson, 2003; Thompson, 2005).

Religion includes many other things besides contemplative experience, and many religions have little or no place for contemplative experience. Conversely, contemplative experience is found in other contexts besides religion, such as philosophy (McGee, 2000). For these reasons, the term ‘religion’, at least as the term is generally used in the West, is not a good designation for the kind of practice and experience that neurophenomenology seeks to bring into constructive engagement with cognitive science. A better description might be the kind of self-cultivation and self-knowledge cultivated by the world’s contemplative ‘wisdom traditions’ (Depraz, Varela, and Vermersch, 2003). Nor does the term ‘science-religion dialogue’ describe the motivation for neurophenomenology, for the aim is not to compare, evaluate, or adjudicate between the claims of science and religion, but to gain a deeper understanding of human experience by making contemplative phenomenology a partner in the scientific investigation of consciousness.

Of course, if ‘science-religion dialogue’ were understood as this sort of task – and many, especially in the Eastern traditions, do understand it in this way – then the gap between neurophenomenology and religion-science discussions would not be so great. Similarly, if the goal of gaining a deeper understanding of human experience is taken as a religious practice – as it certainly is in Buddhism – then neurophenomenology might be seen as part of, or at least parallel to, religious practice.

The Jamesian Heritage

Over one hundred years ago, William James, in his *Principles of Psychology*, wrote that in the study of subjective mental phenomena, ‘Introspective Observation is what we have to rely on first and foremost and always’ (James, 1981: 185). Psychology, as James presented it in this landmark book, is the study of subjective mental phenomena - mental events as experienced in the first-person - as well as the study of how mental states are related to their objects, to brain states, and to the environment. Whereas physiological psychology studies the relation of mind and brain, including the naturally evolved ‘mutual fit’ of mental faculties and the environment, introspection studies mental states in their subjective manifestations. Yet, what exactly is introspection? James continued: ‘The word introspection need hardly be defined - it means, of course, the looking into our own minds and reporting what we there discover. *Everyone agrees that we there discover states of consciousness?*’ (James, 1981: 185).

This passage is often quoted, but less often remarked is that James hardly thought introspection to be easy or an infallible guide to subjective mental life. Later in his book, when discussing sensed moments of transition in the subjective stream of thought and feeling, he wrote:

Let anyone try to cut a thought across in the middle and get a look at its section, and he will see how difficult the introspective observation of the transitive tracts is... The attempt at introspective analysis in these cases is in fact like seizing a spinning top to catch its motion, or trying to turn up the gas quickly enough to see how the darkness looks (James, 1981: 236-7).

James clearly did not think that we already know the nature and full range of thought and feeling simply because we are able to look into our own minds. In 1904 James heard the Theravada Buddhist renunciate Anagarika Dharmapala lecture at Harvard on the Buddhist conception of mind. According to the Buddhist view, there is no single, permanent, enduring self

underlying the stream of mental and physical events. Afterwards, James rose and proclaimed to the audience, ‘This is the psychology everybody will be studying twenty-five years from now’. He apparently meant not so much Buddhist psychology *per se*, but a psychology of the full developmental range of human consciousness, pursued with the kind of phenomenological precision exemplified by Buddhism (Taylor, 1996: 146).

James’s prediction, of course, was too optimistic. The words of another founding father of American psychology, James McKeen Cattell, also from 1904, indicate the path that much of psychology took in the years to come: ‘It is usually no more necessary for the subject in a psychology experiment to be a psychologist than it is for the vivisectioned frog to be a physiologist’ (Cattell, 1904, as quoted by Lyons, 1986: 23). The strategy psychology pursued was to objectify the mind as much as possible, either as behavioural performance, physiological response, or with the rise of cybernetics and then cognitive science, as nonconscious information processing. ‘Consciousness’ became a taboo term; introspection was rejected as a method for investigating the mind; and it was no longer necessary for the psychologist to have any disciplined first-person expertise in the subjectivity of mental life. Although there were notable exceptions to this trend, such as Gestalt psychology and phenomenological psychology, this ‘taboo of subjectivity’ (Wallace, 2000) has influenced the scientific study of the mind for decades.

It has taken over a full century, not a quarter of one, for the science of mind to begin to find its way back to James’ vision of a science of mental life, including ‘the varieties of religious experience’ (James, 1997), which integrates experimental psychology, neuroscience, and phenomenology. In recent years, a small but growing number of cognitive scientists have come to accept that there cannot be a complete science of the mind without understanding subjectivity and consciousness, and that cognitive science accordingly needs to make systematic use of introspective first-person reports about subjective experience (Jack and Roepstorff, 2002, 2003). As cognitive neuroscientist Chris Frith recently stated: ‘A major programme for 21st century science will be to discover how an experience can be translated into a report, thus enabling our experiences to be shared’ (Frith, 2002: 374).

Contemplative Mental Training and Cognitive Science

This renewed appreciation of the first-person perspective raises the question of how to obtain precise and detailed first-person accounts of experience. On the one hand, it stands to reason that people vary in their abilities as observers and reporters of their own mental lives, and that these abilities can be enhanced through mental training of attention, emotion, and metacognition. Contemplative practice is a vehicle for precisely this sort of cognitive and emotional training. On the other hand, it stands to reason that mental training should be reflected in changes to brain structure, function, and dynamics. Hence, contemplative practice could become a research tool for developing better phenomenologies of subjective experience and for investigating the neural correlates of consciousness.

The potential importance of contemplative mental training for scientific research on consciousness is central to neurophenomenology (Lutz, Dunne, and Davidson, in press). Concretely, neurophenomenology proposes to incorporate ‘first-person methods’ of examining experience into experimental research on subjectivity and consciousness. First-person methods sensitize individuals to their own mental lives through the systematic training of attention, emotion regulation, and metacognitive awareness (awareness of cognition itself) (Varela and Shear, 1999). Such methods and training have been central to the Buddhist tradition since its inception (Wallace, 1998, 1999). In Tibetan Buddhism, contemplative mental training is often

described as a systematic process of ‘familiarizing oneself’ with the moment-to-moment character of mental events (Lutz, Dunne, and Davidson, in press). This description points towards the relevance of contemplative mental training to neurophenomenology: contemplative training cultivates a capacity for sustained, attentive awareness of the moment-to-moment flux of experience or what James famously called ‘the stream of consciousness’. For this reason, the Buddhist tradition holds special interest for neurophenomenology (Lutz, Dunne, and Davidson, in press; Varela, Thompson, and Rosch, 1991).

It is worth reconsidering, from this vantage point of contemplative mental training, how psychology came to reject introspection shortly after James. According to the standard history, introspection was given a fair try but failed. It failed allegedly because the two rival schools of introspectionist psychology were unable to agree whether there was such a thing as imageless thought. James had already observed, however, that the form of introspection practiced by these schools was stilted and tedious, because it focused on the sensations caused by impoverished sensory stimuli (James, 1981: 191-2). It is not surprising that introspection of this sort turned out to be so unilluminating, as Gestalt psychologists and phenomenologists also later remarked (Köhler, 1947: 67-99; Merleau-Ponty, 1962: 3-12). Furthermore, the textbook history neglects to mention that the rival schools did agree with each other at the descriptive level of introspective phenomenology; their disagreement, rather, was at the level of theoretical or potentially causal interpretations. One lesson to be learned from this debate, therefore, is not that introspection is a useless method for obtaining descriptive accounts of subjective experience, but rather that psychology needs to discriminate carefully between the description of subjective phenomena and causal-explanatory theorizing (Hurlbert and Heavey, 2001). A similar lesson should be drawn from the famous studies of Nisbett and Wilson in 1977: they observed that subjects often said their behaviour was caused by mental events when it was really the result of external manipulation (Nisbett and Wilson, 1977). Yet these inaccurate subjective reports were causal-explanatory in form, not rigorously descriptive and phenomenological. Again the lesson to be learned is that experimental participants need to be coached to pay strict attention to their felt cognitive processes and to avoid causal-explanatory conjectures (Hurlbert and Heavey, 2001).

Yet how is such attention to be cultivated? First-person methods of examining experience, particularly those examined by Varela, Shear, Wallace, and others, are concerned with precisely this question (Varela and Shear, 1999). What makes Buddhist contemplative mental discipline exemplary in this context is its pragmatic refinement and theoretical sophistication (Depraz, Varela, and Vermersch, 2003). Whereas James described introspection as simply ‘looking into our own minds and reporting what we there discover’, Buddhism speaks of sustained attention to and analytic discernment of one’s own mental processes. Buddhist phenomenology distinguishes between attentional stability and instability due to mental excitement, and between attentional vividness and dullness due to mental laxity (Wallace 1999). Buddhist phenomenology also discusses the metacognitive monitoring of these qualities of attention, and Buddhist epistemology discusses the degree to which a mental cognition ascertains or fails to ascertain its mental object, according to various conditions (Dreyfus, 1997). According to this perspective, if the stream of thought and feeling is lucid, rather than turbulent and murky, then introspection in James’s sense will be much richer in its discoveries and reports.

The working hypothesis of neurophenomenology appeals to this notion of refined first-person observation and description of subjective mental events. In an experimental context, this working hypothesis is twofold. First, phenomenologically precise first-person reports produced through mental training can provide important information about endogenous and externally

uncontrollable fluctuations of moment-to-moment experience, such as quality of attention (Lutz et al., 2002). In addition, individuals who can generate and sustain a particular type of contemplative state cultivated in the Buddhist tradition - a state in which one mind reposes, awake and alert, in the sheer 'luminosity' of consciousness (its quality of nonreflective and open awareness), without attending exclusively to any particular object or content - could provide important information about subjective aspects of consciousness not readily apparent or accessible to ordinary introspection or reflection (Lutz, Dunne, and Davidson, in press).

Second, the refined first-person reports produced through mental training can help to detect and interpret physiological processes relevant to consciousness, such as large-scale dynamical patterns of synchronous oscillatory activity in neural assemblies. Experimental studies following this approach have already cast light on the neurodynamics of conscious visual perception (Cosmelli et al., 2004; Lutz et al., 2002), epileptic activity and associated subjective mental events (Le Van Quyen and Petitmengin, 2002), pain experience (Price, Barrell, and Rainville, 2002; Rainville, 2005), and the neurodynamical correlates of meditative states in highly trained Tibetan Buddhist practitioners (Lutz et al., 2004).

A further conjecture regarding contemplative mental training and experience is also important. Individuals who can generate and sustain specific sorts of mental states, and report on those states with a high degree of phenomenological precision, could provide a route into studying the causal efficacy of mental processes - how mental processes may modify the structure and dynamics of the brain and body. According to a neurodynamical perspective, mental states are embodied in large-scale dynamical patterns of brain activity (Thompson and Varela, 2001), and these patterns both emerge from distributed, local activities and also globally shape or constrain those local activities. One can thus conjecture that in intentionally generating a mental state, large-scale brain activity shifts from one coherent global pattern to another, and thereby entrains local neural processes (Freeman, 1999; Thompson and Varela, 2001). Thus, individuals who can intentionally generate, sustain, and report on distinct types of mental states could provide a way of testing and developing this idea.

Neurophenomenological research based on the foregoing hypotheses has potentially profound implications for both cognitive science and contemplative wisdom traditions. Were such research to prove fruitful, adept contemplatives could become a new kind of scientific collaborator, rather than simply a new type of experimental participant, for their first-person expertise would be directly mobilized within scientific research on the mind. To conclude this chapter, I would like to relate this idea to the overall theme of this Handbook.

Towards a Contemplative Science of Mind

At the outset of this chapter, I stated that the aim of neurophenomenology is not to adjudicate between the claims of science and religion with regard to human experience, but to gain a deeper understanding of experience by making contemplative phenomenology a partner in the scientific investigation of consciousness. Varela, Thompson, and Rosch (1991) have described this approach as one of 'mutual circulation' between science and experience. According to the logic of mutual circulation, each domain of cognitive science, phenomenological philosophy, and contemplative mental training is distinct and has its own degree of autonomy - its own proper methods, motivations, and concerns - but they also overlap and share common areas. Thus, instead of being juxtaposed, either in opposition or as separate but equal, these domains can flow into and out of each other, and so be mutually enlightening.

This vision of mutual circulation does not fit easily within the established frameworks of the science-religion dialogue. We can appreciate this point by distinguishing the mutual-circulation perspective from some of the main representative positions staked out in the science-religion dialogue, particularly as this dialogue touches on the nature of the human mind.

First, exploring the mutual circulation of mind science and contemplative experience is different from viewing science and religion as ‘non-overlapping magisteria’ (Gould, 1999). This separate-but-equal strategy of insulating science and religion is highly problematic. It divides science and religion along the lines of a subject-object dualism: science addresses the empirical world conceived as a realm of objectivity, whereas religion address the subjective realm of human purposes, meaning, and value. Yet this subject-object dualism breaks down in the face of the intersubjectivity of human experience (Thompson, 2005). Intersubjective experience is the common terrain of both science and religion, and it is poorly understood when fractured along the lines of a subject/object (or fact/value) dichotomy (Wallace, 2005).

Second, the mutual circulation approach is different from looking for the physiological correlates of religious experiences (e.g., Newberg, D’Aquili, and Rause, 2001). The key difference is that adept contemplatives, as mentioned above, are not considered simply as experimental participants, but as scientific collaborators. Thus, the mutual circulation approach enables us to envision future cognitive scientists being schooled in contemplative mental training and phenomenology, as well as brain-imaging techniques and mathematical modeling, and future contemplative practitioners being knowledgeable in neuroscience and experimental psychology. Science and contemplative knowledge could thus mutually constrain and enrich each other. James envisioned this sort of prospect over a century ago in his writings on scientific psychology and religious experience (see Taylor, 1996).

Third, the mutual circulation approach is different from the cognitive science of religion, especially evolutionary-psychology explanations of religious thought and behaviour (Boyer, 2001, 2003, 2005). Although these explanations are illuminating in linking religious concepts to our intuitive understandings of agency, social relations, and misfortune (see Boyer, 2005), they neglect the contemplative aspect of certain religious traditions. Whereas evolutionary psychology takes religious notions and norms as objects of explanation for evolutionary and functionalist cognitive science, neurophenomenology looks to the role that contemplative mental training and experience can play in a phenomenologically enriched cognitive science.

A common feature of the three approaches to science and religion I have contrasted with the mutual circulation approach is that they take the concepts of ‘science’ and ‘religion’ largely for granted. These concepts, however, are deeply problematic. They are European intellectual categories that have been shaped in recent Western history by the science-religion conflicts of the European enlightenment and modernity. As such, they do not map in any clear way onto the knowledge formations and social practices of certain other cultural traditions, in particular those of Asian contemplative wisdom traditions (see Hut, 2003). As Wallace has recently written in his introduction to a volume on Buddhism and science:

The assertion that Buddhism includes scientific elements by no means overlooks or dismisses the many explicitly religious elements within this tradition... Buddhism is very much concerned with human purposes, meaning, and value. But, like science, it is also concerned with understanding the realms of sensory and mental experience, and it addresses the questions of what the universe, including both objective and subjective phenomena, is composed of and how it works... Buddhism does address questions concerning the meaning and purpose

of life, our ultimate origins and destiny, and the experiences of our inner life. But the mere fact that Buddhism includes elements of religion is not sufficient for singularly categorizing it as a religion, any more than it can be classified on the whole as a science. To study this discipline objectively requires our loosening the grip on familiar conceptual categories and preparing to confront something radically unfamiliar that may challenge our deepest assumptions. In the process we may review the status of science itself, in relation to the metaphysical axioms on which it is based (Wallace, 2003: 9-10).

In this chapter, I have proposed that certain contemplative wisdom traditions - Buddhism most notably though not exclusively - and certain approaches in cognitive science - the embodied approach and neurophenomenology - are not simply compatible, but mutually informative and enlightening. Through back-and-forth circulation, each approach can reshape the other, leading to new conceptual and practical understandings for both. At stake in this possibility is nothing less than the prospect of a mature science of the mind that can begin to do justice to the rich and diverse traditions of human contemplative experience.

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