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Four Problems of Mind and Body

Celebrating the 80th Birthday of Max Velmans

Abstract: *Inspired by the 'reflexive monism' of Max Velmans, this paper considers four problems of mind and body. (1) The traditional mind–body problem, including the 'easy' problem of identifying the neural correlates of consciousness, and the 'hard' problem of determining just how neural processes generate conscious states. (2) The distinction between automatic (unconscious) and controlled (conscious) processes, raising the question about the relative roles they play in experience, thought, and action, as well as the question of free will. (3) Psychosomatic effects, including the stress–disease connection, placebo effects, and hypnotic suggestion, in which beliefs appear to have consequences for bodily processes outside the nervous system. (4) Whether mind can exist in the absence of a bodily host, as exemplified by spiritualism and parapsychology. As challenging as the easy and hard problems are, psychology can advance as a science of mental life without ever solving them.*

For more than 30 years, Max Velmans has been a leader in the study of consciousness. In addition to his own work (e.g. Velmans, 1990; 2017), he organized the 1992 Ciba Foundation Symposium (#174) on

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Journal of Consciousness Studies, **30**, No. 1–2, 2023, pp. 87–109
DOI: 10.53765/20512201.30.1.087

'Experimental and Theoretical Studies of Consciousness' — one of the few conferences in that series that was *not* focused on biomedical or pharmaceutical research (Bock and Marsh, 1993). And as an editor, he has assembled several anthologies of important articles on various aspects of consciousness, creating very handy reference works for the rest of us to use: the invaluable *Blackwell Companion to Consciousness* (Velmans and Schneider, 2007; Schneider and Velmans, 2017) and the massive four-volume collection of papers on *Consciousness* in Routledge's 'Current Concepts in Psychology' series (Velmans, 2018).

Like many philosopher-psychologists, Velmans has been primarily interested in the mind–body problem. He calls his particular approach *reflexive monism*. It is monistic because it holds that there is only one kind of thing in the universe. Given the choice between mind and body, he comes down on the side of body: the one thing that makes up the universe is matter — material stuff, as opposed to 'mind-stuff' (James, 1890/1980, chapter 6). The term 'reflexive' is a little surprising, because we usually think of reflexes as involuntary, unconscious responses to stimulation. But Velmans means something closer to the original Latin root *reflexivus*, meaning 'directed upon itself'. In the social sciences, something is 'reflective' if it can take account of — *reflect on* — itself. Sometime in evolutionary history, certain forms of matter developed the capacity to reflect on themselves and the world. That reflective capacity is the capacity for consciousness, and it is very much part of the material world. Humans have it; some other organisms might have it, too.

Velmans' idea departs from some other prominent proposals in that it puts the self at the centre of consciousness. This contrasts with many other theories that propose abstract, content-free bases for conscious experience. Crick and Koch (1990), for example, suggested that conscious perception arose when neural ensembles representing various aspects of a stimulus fired synchronously at a rate of 40 Hz. The global workspace theory (Baars, 2002) identifies consciousness with something like working memory. The integrated information theory holds that consciousness reflects the ability of the thalamocortical system to rapidly integrate the activities of different brain modules, generating complex patterns of brain activity (Tononi, 2008).

To be able to reflect on oneself presumes that there is a self to reflect on. Consciousness requires some contact between a percept, memory, etc. on the one hand, and on the other a mental

representation of the self as the agent or patient of some action, or the stimulus or experiencer of some state; unconscious processing, as in the priming effects of implicit perception and memory, lacks this element of self-reference (Kihlstrom, 1993; 1995; 1997; 2022). Damasio (1994) has taken a similar position, with his distinction between the 'core self', which monitors the internal state of the body in functions such as homeostatic regulation; 'core consciousness', which links ongoing sensory-perceptual experience to the core self; and 'extended consciousness', which links the core self to memory. In any event, as James put it, 'It seems as if the elementary psychic fact were not *thought* or *this thought* or *that thought*, but *my thought*, every thought being owned... The universal conscious fact is not "feelings and thoughts exist" but "*I* think" and "*I* feel"' (1890/1980, p. 221, italics in the original).

1. The 'Unbridgeable Gulf' Between Body and Mind

The phrase 'unbridgeable gulf' comes from Wittgenstein, who remarked on the 'unbridgeable gulf between consciousness and brain-processes' (1953/1958, Part I, Section 412, p. 124e). Ever since Descartes, this is where most philosophical enquiry into consciousness has been focused. Beyond the metaphysics of dualism and monism, materialism and immaterialism (Kihlstrom, 2002), research inspired by the philosophers' mind–body problem has focused on the search for the neural correlates of consciousness (NCCs), defined as 'the minimum neural mechanisms sufficient for any one specific conscious percept' (Koch *et al.*, 2016, p. 307).

This search has been hampered, to some degree, by disagreement and uncertainty as to just what consciousness is. Consciousness cannot simply be identified with mental activity, because to some degree perceiving, remembering, thinking, and the like can go on unconsciously (Kihlstrom, 1987; 2012; 2019; Kihlstrom *et al.*, 2000). While it is common to think of consciousness in terms of working memory and attention, this also does not suffice: in cases of attentional blindness, such as repetition blindness, the attentional blink, and change blindness, we are unaware of things even though we are attending to them (Friedenberg, 2012). Content also matters: the neural correlates of conscious perception may be quite different from the neural correlates of conscious recollection; the neural correlates of conscious emotion may be different from those of conscious motivation.

If the phenomenology is wrong, the neuroscience cannot be right. Velmans is correct to insist that the core feature of consciousness is its first-person ontology: conscious mental states do not exist in the absence of a person who is experiencing them (Searle, 1992). For this reason, consciousness cannot be reduced to the third-person perspective preferred by neuroscience without leaving its essence behind. To repeat James, 'The universal conscious fact is not "feelings and thoughts exist" but "*I* think" and "*I* feel"'. We might also say that the universal conscious fact is not 'consciousness exists' but '*I* am conscious'. We will never find the neural correlates of consciousness if we leave out subjectivity and the self.

It should also be acknowledged that NCCs are just that — *correlates* of consciousness. And as every sophomore knows, correlation does not imply causation. Any particular neural *correlate* of consciousness may be a neural *cause* of consciousness, but it may also be a neural *consequence* of consciousness, leaving the neural *causes* of consciousness to be found elsewhere. Then, once we discover the genuine neural correlate(s) of consciousness, solving Chalmers' (1996) 'easy problem', there will remain his 'hard problem' — echoing Wittgenstein's conclusion about consciousness (1953/1958): 'THIS is supposed to be produced by a process in the brain! — as it were clutching my forehead.'

2. Body Without Mind

In a variant on his 'hard problem', Chalmers poses this question: 'Why doesn't all this information-processing go on "in the dark", free of any inner feel?' (1995, p. 203). Velmans asserts that consciousness evolved as a property of certain forms of matter, which implies that consciousness is somehow adaptive. Some time ago, a prominent cognitive scientist gave a lecture at Berkeley on the subject of consciousness. Afterwards, he reported that he had lost his PalmPilot during the visit, and enquired if anyone had found it. Which led me to wonder: can a zombie lose its PalmPilot?

Of course, the answer depends on how one defines a zombie. Philosophers generally define a zombie as a creature that is physiologically and behaviourally indistinguishable from a human being, but lacks consciousness (Chalmers, 1996; Kirk, 1974). But this begs the question of whether a humanoid that lacks consciousness *could* be behaviourally identical to a real, living, conscious human. It would be better to define a zombie as a human-like creature that lacks

consciousness, and then determine what the behavioural consequences of that lacuna might be. In terms of Velmans' position of reflexive monism, it would seem that zombies — as unconscious stimulus–response machines — lack the ability to reflect on their circumstances or their behaviour: they cannot respond to anything that is not in their immediate stimulus environment; they cannot lose their PalmPilots.

Setting aside arguments about evolution and zombies, there is a highly visible caucus within psychology and cognitive science that holds that information processing *really does* go on in the dark, at least for the most part (Kihlstrom, 2008). In the late 1970s, some social psychologists began publishing papers with titles like 'Telling More Than We Can Know' (Nisbett and Wilson, 1977) and 'The Mindlessness of Ostensibly Thoughtful Action' (Langer, Blank and Chanowitz, 1978). The first was a critique of introspection, and argued that we are generally unaware of why we do what we do, and that the reasons we give are typically little more than after-the-fact rationalizations. The second argued that we do not pay too much attention to what is going on around us, and that our social behaviour is mediated by overlearned 'scripts' that we apply without too much thought. The affective counter-revolution in psychology began with a demonstration of mere exposure effects caused by subliminal stimulation, leading to the conclusion that 'Preferences Need No Inferences' (Zajonc, 1980) — at least not conscious ones.

At about the same time, cognitive psychology began to embrace a distinction between controlled and automatic processes (Moors, 2016). In principle, automatic processes are (1) inevitably executed by the appearance of a critical stimulus in the environment; (2) once activated, they run incorrigibly to completion; (3) they consume few or no attentional resources; and (4) they create little or no interference with other ongoing processes. Automatic processes are exemplified by the Stroop colour–word interference effect: subjects apparently cannot help but read words even though they are only asked to identify the colour in which they are printed. Automatic processes occur unconsciously, outside of phenomenal awareness and voluntary control.

Perhaps because of their historical emphasis on situational influences, some social psychologists were quick to embrace the concept of automaticity. Wegner and Bargh (1998) interpreted several classic experiments in social psychology, such as Milgram's obedience experiments, in terms of automaticity: obedience is an automatic response to the presence of an authority figure. Perhaps the most vigorous exponent of this point of view is John Bargh, as in his papers

on 'The Automaticity of Everyday Life' (1997) and 'The Unbearable Automaticity of Being' (Bargh and Chartrand, 1999). In a recent book arguing that a great deal of thought and action happens 'Before You Know It', Bargh (2017, p. 159) approvingly quotes Freud (1900/1953, p. 593): 'The most complicated achievements of thought are possible without the assistance of consciousness.' If that is true, what role is there for conscious will as a cause of behaviour?

One answer: none. Wegner (2002) claimed that conscious will is an illusion, and that the true causes of our behaviours are unconscious. Wegner supported his argument by citing research on automatic processing, but he was inspired by a famous experiment reported by Libet and his colleagues (Libet *et al.*, 1983). Libet asked his subjects to make a simple movement 'at will', and also to note the moment that they decided to do so on a special clock. Recording his subjects' EEG, he observed that a negative event-related potential, known as the readiness potential, actually emerged *before* they were aware of their intention to make the movement. From this 'predecisional negative shift' (PNS), Libet (and Wegner) concluded that action is initiated unconsciously. Conscious control comes into play only after the fact, as a sort of veto over something that has already begun to happen.

One problem in evaluating the extent of automatic, unconscious influences on behaviour is that the proponents of automaticity often define unconscious influences very broadly — or not at all, simply asserting that a process is automatic. Early in the study of automaticity, theorists were careful to present stimuli subliminally, or otherwise outside the scope of conscious attention. But more recently, there has been a tendency to define automaticity down, to cover processing that is merely incidental — that is, whenever subjects do something other than what they have been specifically instructed to do.

A better approach is to think of the four prototypical features of automaticity as constituting a kind of operational definition of the concept. Unless an experiment employs something like this operational definition, we cannot be sure that some process is really being performed automatically and unconsciously. On the downside, even Stroop interference may not satisfy strict application of the four canonical features of automaticity listed earlier (Besner and Stolz, 1999). The characteristic features of automaticity appear continuous rather than categorical in nature, and they also appear to be imperfectly correlated with each other. Still, the more of those features

present, to the extent that each of them is present, the more certain we can be that a process is performed automatically and unconsciously.

Early in the evolution of the concept of automaticity, mental processes were divided into two classes. Some processes were innately automatic while others were controlled; but with extensive practice, controlled processes could also become automatized, laying the foundation for phenomena like Stroop interference (which requires that the subject be a skilled reader). An alternative approach is to think of every task as reflecting some blend of automatic and controlled processes. Accordingly, Jacoby (1991) proposed a 'process dissociation procedure' (PDP) for separating automatic (unconscious) and controlled (conscious) influences on task performance. The PDP, or something like it, has now been applied in a wide variety of cognitive and social paradigms (Payne and Cameron, 2014; Yonelinas and Jacoby, 2012). A fair summary of this literature is that, under ordinary circumstances, task performance reflects a blend of automatic and controlled processing; automaticity dominates performance under time pressure, diminished motivation or effort, and other circumstances. So while automaticity clearly plays a role in experience, thought, and action, the research hardly rules consciousness out of the picture.

But what about the Libet experiment? Often replicated but much debated (Banks and Pockett, 2007; Papanicolaou, 2017), it turns out that the PNS is wholly an artefact of Libet's method. Logically, it should appear whenever subjects make a voluntary movement, regardless of whether they are watching the clock. But when subjects make their movements *without* simultaneously watching the clock, all trace of it disappears (Miller, Shepherdson and Trevena, 2011). The PNS, typically interpreted as marking an unconscious decision to act, is an adventitious consequence of clock-watching (Kihlstrom, 2017b). We may not have free will — consciousness may be epiphenomenal, and we are conscious automatons after all — but the Libet experiment does not demonstrate it.

3. The 'Puzzling Leap' Between Mind and Body

Just as Wittgenstein despaired of ever understanding how the brain generated conscious mental states, so Freud worried about the reverse — remarking, in his case of the 'Rat Man', that 'the leap from a mental process to a somatic innervation... can never be fully comprehensible to us' (Freud, 1909/1953, p. 156); and again, in the *Intro-*

ductory Lectures on Psychoanalysis, referring to the 'puzzling leap' between mind and body (1915–17/1963, p. 258). In both cases Freud was referring specifically to hysteria, but their scope can be expanded to include all 'psychosomatic' interactions.

Psychosomatic illnesses are in bad odour now, partly because of overreach by psychoanalysts — who proposed, for example, that stomach ulcers arose from unconscious conflicts between infantile dependency and adult pride (Alexander, 1950), and that cancer occurred in people who bottled their emotions up so tightly that they burst out as tumors (Sontag, 1977). The current version of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*) virtually defines them out of existence (Harrington, 2008).

As a case in point, consider stomach ulcers, the classic example of a stress-induced psychosomatic illness. Both the psychoanalytic and the stress-disease views of ulcers were challenged by the discovery of an association between peptic ulcers and infection with the bacterium *H. pylori* (Hyman, 1994). But it turns out that while antibodies for *H. pylori* infection are found in the vast majority of ulcer patients, they are also found in the vast majority of ulcer-free patients, leading one group of researchers to conclude that 'Autonomic nervous dysfunction as well as H. pylori infection appears to be a necessary condition for chronic peptic ulcer formation' (Nomura *et al.*, 2000, p. 82). That phrase, 'autonomic nervous system dysfunction', refers to chronic autonomic nervous system arousal, an effect of chronic stress, mediated by the hypothalamic-pituitary-adrenocortical axis (HPA) or the sympathetic-adrenal-medullary axis (SMA). We now understand that stress, in all its forms, has deleterious effects on a variety of endocrine and immune systems, and even our DNA, rendering people more susceptible to various illnesses (Cohen, Murphy and Prather, 2019; Epel and Prather, 2018). But stress is not just a bodily response to a challenging event, as the dictionary has it. Stress is also a mental state. Whatever the role of *H. pylori* may be, animal research confirms that psychological stress, in the form of exposure to unpredictable and uncontrollable foot shock, plays an independent causal role in precipitating and sustaining gastric ulceration (Overmier and Murison, 2013).

Similarly, the placebo effect — often called 'the "crown jewel" of psychosomatic medicine' — reflects patients' beliefs that they are receiving effective treatment (Benedetti, 2014; Harrington, 1997; Miller *et al.*, 2013; Shapiro and Shapiro, 1997). Placebo effects can be powerful indeed. Evans (1974; 1985) estimated that placebo analgesia was a constant 50% of the active drug to which it was compared.

Kirsch and Saperstein (1998), in a similar analysis of antidepressant medication, estimated that placebos were about 75% as effective as the drugs to which they were being compared (see also Kirsch *et al.*, 2002). These analyses have been criticized because the studies in question are not completely blind: the physicians knew what active agents were being used in the study. But that criticism misses the point. Of course the physicians knew what they were prescribing — or at least they thought they did; and they naturally passed that information on to their patients, whose expectations and beliefs generated 'drug-specific' placebo effects.

The existence of placebo effects is so widely assumed that placebos are typically employed in clinical trials to determine whether new drugs have any specific effects on medical outcomes. But just as drugs must be compared to placebos in order to determine their effectiveness, placebos might be compared to a control condition (such as no treatment) to determine *their* effectiveness. Because drug studies are typically funded by the pharmaceutical industry, which is not interested in placebo effects (except as something to improve upon), there are few such studies in the literature. Hróbjartsson and Gøtzsche (2001a,b; 2004) marshalled the available evidence and concluded that the effects of placebo were minor at best. In their view, what appear to be placebo effects are mostly attributable to spontaneous remission, regression to the mean, or some other artefact. This conclusion generated a lot of controversy (and probably reassured many physicians and pharmaceutical sales representatives), but Hróbjartsson and Gøtzsche's analysis had problems of its own, particularly with respect to the heterogeneity of conditions included in their analysis, and the fact that some of them lacked effective treatments to which placebos could properly be compared (Greene *et al.*, 2001; Kirsch, 2002).

Moreover, other analytical approaches confirm that placebos are effective after all (Evans, 1974; Kirsch, 2002). For example, it turns out that placebos have 'pharmacological' properties. As noted earlier, their effects are influenced by patients' assumptions concerning the effectiveness of the drug they are supposed to be getting. Placebos show dose–response and time–effect curves similar to that of the active drug to which they are being compared (e.g. two placebos work better than one). Placebos create additive effects with medication (drug plus placebo is better than drug alone). Placebo 'packaging' is also important. Placebos delivered intravenously are more effective than placebos delivered through intramuscular injection, which are

more effective than placebos delivered orally. And for placebos delivered orally, big, dark-coloured, bad-tasting placebos are better than small, brightly coloured, good-tasting ones. Physicians who frequently resort to medications get bigger placebo effects than those who do not. Placebos are more effective in treating severe, compared to mild, illness. More expensive placebos are more effective than less expensive ones, and there is some evidence that generic drugs are less effective than their brand-name, reference-drug counterparts — even though, by definition, the two types of drugs are biologically equivalent. All these effects testify to the importance of beliefs and expectations.

One problem with placebo effects as evidence of mind-to-body causation is that so much of the evidence involves subjective feelings of pain, depression, and the like — i.e. of effects on *mental* states. As such, many placebo effects might better be construed as examples of *mind-to-mind* causation: *believing* that a pill is a potent analgesic causes the patient to *feel* less pain. Even so, placebo analgesics can have physiological as well as subjective effects: they release endogenous opiates, and their effects can be reversed by naloxone (Sauro and Greenberg, 2005).

Of course, all mental states, including believing and feeling, have their biological basis in neural activity. But in the present context, the really interesting placebo effects are on bodily processes that occur outside the nervous system. Kaptchuk and his colleagues have found that placebo acupuncture leads to relief of the symptoms of irritable bowel syndrome (IBS; Kaptchuk *et al.*, 2010; Lembo *et al.*, 2009). But IBS may not necessarily be a good example, precisely because it is generally regarded as a somatoform illness, with no physical findings in the gastrointestinal system, and for which psychosocial interventions are the standard of care. Placebos cannot affect physical findings in IBS (such as the inflammation or destruction of the bowel wall characteristic of irritable bowel *disease*), because by definition there are none.

More to the point are some 'challenge' studies employing variants of the 'symptom-provocation' method familiar in the diagnosis and treatment of allergies and asthma. A number of such studies have found that a saline solution presented as a bronchoconstrictor can induce bronchoconstriction in asthmatic patients, while the same inert solution presented as a bronchodilator can induce bronchodilation (for a review, see Sodergren and Hyland, 1999). Likewise, studies employing the balanced placebo design, in which some subjects are told they

are receiving placebo but actually receive an active drug, show that beliefs can modulate objective end points as well as subjective experience (Hull and Bond, 1986; Kleijnen *et al.*, 1994). And in a creative variant on the placebo design, Benedetti and his colleagues have found that response to treatment is greater when patients know it is being delivered, than when they do not; this is true for both subjective experiences, like postoperative pain and anxiety, and objective end points, such as motor control in Parkinsonism and cardiac activity in subjects administered beta blockers (Benedetti *et al.*, 2003). Benedetti and colleagues' findings remind us that every medical treatment has a placebo component which can potentially affect both the subjective and objective course of treatment.

A great deal of research on psychosomatic interactions has employed suggestions delivered while subjects are hypnotized (Bowers and Kelly, 1979). These include a careful case study of the successful hypnotic treatment of ichthyosis (Mason, 1952; 1955), a series of cases of contact dermatitis (Ikemi and Nakagawa, 1962), and several cases of suppression of the Mantoux reaction used in the diagnosis of tuberculosis (Black, Humphrey and Niven, 1963). In a 10-year-long clinical series, Collison (1975) reported that 84% of highly hypnotizable patients experienced substantial improvement or complete remission of their asthma; similar results were achieved with 57% of moderately hypnotizable patients, but only 6% of insusceptible patients. Although much research remains to be done, it is fairly clear that hypnotic suggestion can facilitate the treatment of burns (Chapman, Goodell and Woolff, 1959; Ewin, 1983; Moore and Kaplan, 1983; Schafer, 1975).

Perhaps the most convincing psychosomatic effects of hypnosis involve the treatment of dermatological warts (e.g. Asher, 1956; Surman *et al.*, 1973; Ullman and Dudek, 1960; Sinclair-Gieben and Chalmers, 1959). In an experimental study by Spanos and his colleagues (Spanos, Stenstrom and Johnson, 1988), subjects who received typical hypnotic suggestions for wart remission showed the greatest remission of warts, compared to both a placebo group who received treatment from a plausible 'cold laser', and a third group who received no treatment at all. In a second study, subjects who received hypnotic or non-hypnotic suggestion showed greater remission than relaxation or no-treatment controls. The results of the experiments are all the more remarkable because Spanos was well-known for his scepticism regarding hypnosis.

It does not matter whether hypnosis is critical for these results. The key point is that these bodily effects are produced in response to straightforward verbal suggestions, as opposed to psychological stress or the deceptions and conditioning entailed by most placebo trials. To cite them as instances of mind-to-body causation is not to embrace a theory of 'extra-physical causation' (Pernu, 2011, p. 483) — much less to deny 'the metaphysical underpinnings of the modern-day neurosciences' (*ibid.*, p. 484). We are all materialists now, in that we understand that, when it comes to the mental, the brain does it. Percepts, memories, thoughts, feelings, and desires all have their biological bases in the nervous system. Apparently, however, under some circumstances neural activity gets transmitted 'downstream' to affect the functioning of other bodily systems. This is why sildenafil can enhance penile erections in men with erectile dysfunction exposed only to audio-visual stimulation (Suetomi *et al.*, 2005), and why some women can induce orgasms by virtue of imagery alone, in the absence of tactile stimulation (Whipple, Ogden and Komisaruk, 1992). The mental state (the idea or image) comes first; the bodily effect (in the lungs, skin, gut, etc.) follows: that is *prima facie* evidence for mind-to-body causation.

4. Mind Without Body?

We are all materialists now — except those who entertain the possibility that mental states can exist in the absence of any material substrate whatsoever. In the nineteenth century, this question was the province of spiritualism; in the twentieth and twenty-first, parapsychology (or psi). The domain of the paranormal includes such topics as mediumship and 'channelling'; the Ouija board and other forms of 'automatic writing'; extra-sensory perception (ESP), including clairvoyance, telepathy, and precognition; psychokinesis; and past-life, near-death, and out-of-body experiences. Sometimes, these phenomena are simply called *anomalous experiences* — a category that can extend to hallucinations, delusions, and mystical experiences (Cardeña, Lynn and Krippner, 2014; 2017; Marks, 2020; Reed, 1972; Zusne and Jones, 1989). Such a label reflects a theory-neutral stance with respect to these phenomena: experiences of channelling or telepathy can be studied on their own terms, with no commitment to explanations based on supernatural forces or non-local physical influences. Paranormal *experiences* are interesting even if paranormal *effects* are products of normal psychological processes.

Anomalous experiences have been of interest to psychologists at least since the time that Gertrude Stein studied automatic writing under William James's tutelage (Solomons and Stein, 1897). James himself clearly thought that these phenomena provided a unique perspective on human nature and the workings of the mind (James, 1890/1980; 1902/1985; Taylor, 1983), adding to a science of mental life but requiring no supernatural explanations. But that did not prevent him, open-minded pragmatist that he was, from co-founding the American Society for Psychical Research and arranging with various friends to contact him after death, if that proved possible.

It is one thing to have an out-of-body experience; such things are intrinsically interesting, and likely to tell us something about how the mind works. It is quite another, while in such a state, to be able to read a message posted on the upper side of an overhead light fixture. In the present context, what is of interest are explanations of anomalous experiences in terms of 'anomalous processes of information or energy transfer... that are currently unexplained in terms of known physical or biological mechanisms' (Bem and Honorton, 1994, p. 4). In genuine cases of psi, a person's 'consciousness is directly interacting with other minds and with matter... unimpeded by the usual constraints imposed by the physical world' (Alcock, 1988, p. 605).

Setting aside supernatural causes, phrases such as 'usual physical constraints' and 'known physical mechanisms' leave open the possibility that psi effects can be explained by appeals to relativity theory or quantum mechanics. But that puts the cart before the horse. Before we invoke quantum physics to explain psi phenomena, we need to know whether there are reliable phenomena to be explained. By the same token, it will not do for critics of psi research to point out that claims for psi violate the basic laws of physics. Whether in psychology or physics, the whole point of studying anomalous phenomena is that they might tell us something we do not already know about the nature of things. So the only relevant question, right now, is empirical: does anyone ever see the message on the light fixture?

For a long time, research on parapsychological phenomena was confined to the hidden recesses of psychology, but a number of developments in the 1980s led to an upsurge of interest among even mainstream researchers. Partly, this was a by-product of the 'consciousness revival' in psychology. Many of the subjective experiences associated with psi phenomena seemed to entail alterations in consciousness. In addition, reports of Soviet research on remote viewing and psychokinesis had led some in the military and intelligence

communities to become interested in them as potential tools for 'psychotropic warfare'.

In the mid-1980s, the US Army commissioned the National Research Council (NRC), the operating arm of the National Academies of Science, to perform a broad survey of techniques for enhancing human performance. One volume of the report included a survey of selected parapsychological phenomena, including remote viewing and psychokinesis — the phenomena deemed most relevant to military and intelligence applications — as well as experiments involving the popular '*Ganzfeld*' procedure for investigating ESP (e.g. Hyman and Honorton, 1986; Rao and Palmer, 1987). In these experiments, subjects are tested under conditions of restricted environmental stimulation that, hypothetically, will make them more receptive to whatever process generates psi effects. The NRC report concluded that 'Although scattered results are said to be statistically significant, an evaluation of a large body of the best available evidence does not support the contention that these phenomena exist' (Druckman and Swets, 1988, p. 167; for replies, see Palmer, Honorton and Utts, 1989; Rosenthal, 1990).

A phrase like 'scattered results are said to be statistically significant' implies that there are many studies yielding negative results, and cries out for a meta-analysis that combines all available studies into a single estimate of overall effect size — and also permits investigators to massage non-significant effects into statistical significance (Kihlstrom, 1998). More substantively, it permits statistical analysis of potential moderator variables, such as sensory restriction or intuitive vs. deliberative responding. Meta-analyses of parapsychological experiments have proliferated in the years since the NRC report (for overviews, see Cardeña, 2018; Tressoldi and Storm, 2021).

The physical and biological implausibility of psi effects being genuine (Reber and Alcock, 2019) is no reason to reject them out of hand: again, the whole point of studying anomalies is that they might tell us something that we don't already know. But it is also a reason to assign them a very low prior probability in a Bayesian analysis. Duelling meta-analyses have now been supplemented by duelling Bayesian-factor meta-analyses (e.g. Rouder and Morey, 2011; Wagenmakers, Wetzels and Borsboom, 2011), but even Bayesian analyses cannot make some psi effects disappear. Still, even Bayes-factor meta-analyses do not guarantee definitive findings. For all the talk about a 'replication' crisis in psychology, replications do not mean very much if everyone repeats the same mistake. As the saga of

the Libet experiment shows, an empirical claim can build strength through replications and meta-analysis, until just a single experiment reveals a fatal methodological flaw.

5. Beyond the Mind–Body Problem

There is not just one mind–body problem — or even two, easy and hard. There are at least four, and each of them is interesting. With the advent of sophisticated neuroimaging methods, we are now in a position to solve the easy problems of consciousness, if not the hard one. But even the easy problems of consciousness will continue elude us unless we have an accurate description of consciousness at the psychological level of analysis. Velmans' reflexive monism offers some clues: consciousness is not just a matter of information processing capacity, or the interconnections among different systems in the brain. It is about subjectivity, and it is about the self.

The relations between mind and body are an important element of psychological theory and research. Metaphorically speaking, psychology is a stool with three legs: mind in body (the brain as the physical basis of mind), mind in context (mental states are about something other than themselves), and mind in action (mental states stand in relation to action as cause to effect). Identifying the biological bases of mental states and processes, including NCCs, is an important project for psychology, but it is not the only project. Not all psychologists have to be neuroscientists, and psychology does not have to wait for a solution to the mind–body problem, or any other biological advance, in order to make progress (Kihlstrom, 2021b). This is because psychology is essentially a dualistic enterprise, which can investigate mental phenomena without worrying about how the brain does it. After all, neuroscience does not constrain psychological theory: psychology without neuroscience is still the science of mental life; one might say, in fact, that neuroscience without psychology is just the science of neurons (Kihlstrom, 2010).

Even a cursory passage through an introductory textbook will reveal any number of advances in our understanding of mental life that have been achieved without solving the mind–body problem (Kihlstrom, 2017a): the psychophysical laws and signal-detection theory; contingency rather than contiguity as the basis of classical and instrumental conditioning; learning in the absence of reinforcement, and social learning by precept and example; the interaction between bottom-up and top-down processing in perception and cognition; the

reality of mental images; the importance of retrieval cues in remembering and forgetting; prototype and exemplar models of category structure; the role of heuristic 'rules of thumb' in judgment, reasoning, and decision making; the basic emotions; factors supporting and undermining intrinsic motivation; the structure of attitudes and the processes of persuasion and attitude change; the 'Big Five' structure of personality; the importance of the non-shared environment in personality development; diathesis-stress models of psychopathology; and cognitive-behavioural approaches to psychotherapy.

In the same way, while we wait for someone to solve the easy and hard mind–body problems, there are other questions about consciousness we can address empirically (Kihlstrom, 2016) — beginning with the three other mind–body problems discussed here: the relationships between controlled and automatic processing; how mental states can influence bodily processes outside the nervous system; and whether there are any parapsychological phenomena worth taking seriously. How can we identify basic sensory qualia? Under what conditions can unconscious memory be dissociated from conscious memory? To what extent can we extend the implicit–explicit distinction from learning and memory to perception, thinking, emotion, and motivation? How powerful is subliminal perception? Does incubation really occur in problem solving? How valid are intuitions? How can we monitor consciousness during general anaesthesia? Can unconscious processing occur during sleep, anaesthesia, and even coma? How 'minimal' is the minimally conscious state? What, if anything, do dreams mean? Are implicit and explicit cognition dissociated in the conversion and dissociative disorders? What is the nature of hypnotic alterations in consciousness, such as analgesia and posthypnotic amnesia? What happens in states of absorption, flow, daydreaming, and mind-wandering? Does meditation really change how people think? How do psychedelic substances alter perception and the self? How can we characterize the consciousness of non-human animals? Are there cultures, living today, whose inhabitants do not experience consciousness the way most readers of this journal do? Is consciousness an evolved cognitive trait, or did it emerge in historical time?

Some of these questions are easier to answer than others, and the last seems particularly daunting (Kihlstrom, 2021a). But in no case does addressing them require that we solve even the easy problems of consciousness — much less the hard one.

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Journal of Consciousness Studies

controversies in science & the humanities

Vol. 30, No. 1–2, January/February 2023

A Festschrift for Max Velmans

Special Issue edited by Etzel Cardeña

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