

Minds, Brains and Education

DAVID BAKHURST

It is often argued that neuroscience can be expected to provide insights of significance for education. Advocates of this view are sometimes committed to 'brainism', the view (a) that an individual's mental life is constituted by states, events and processes in her brain, and (b) that psychological attributes may legitimately be ascribed to the brain. This paper considers the case for rejecting brainism in favour of 'personalism', the view that psychological attributes are appropriately ascribed only to persons and that mental phenomena do not occur 'inside' the person but are aspects of her mode of engagement with the world. The paper explores arguments for personalism from Russian philosopher Evald Ilyenkov and a number of contemporary Western thinkers, including Peter Hacker and John McDowell. It is argued that, since plausible forms of personalism do not deny that brain functioning is a causal precondition of our mental lives, personalism is consistent with the claim that neuroscience is relevant to education, and not just to the explanation of learning disorders. Nevertheless, it is important that fascination with scientific innovation and technological possibility should not distort our conception of what education is or ought to be, leading us to portray education not as a communicative endeavour, but as an exercise in engineering.

1

From the mid-1960s to the mid-1970s, Soviet philosopher Evald Ilyenkov published a series of writings about the mind-body problem. In these texts, he argued passionately against what I shall call 'brainism', the view (a) that an individual's mental life is constituted by states, events and processes in her brain, and (b) that psychological attributes may legitimately be ascribed to the brain.¹ 'The brain does not think', Ilyenkov maintained, 'a human being thinks with the help of her brain (*s pomoshch'iu mozga*)' (Arsen'ev, Ilyenkov and Davydov, 1966, p. 265; see also Ilyenkov, 1974, p. 183 (1977a, p. 252)).² The psychological subject is the person, not the brain, and moreover, the person in unity with nature and society. Human beings are creatures of the natural world, but

our mindedness does not consist in the occurrence of a special class of events inside us; rather, it lies in our mode of engagement with the world, a mode of engagement possible only because we are social beings.

Ilyenkov was by no means the only Soviet philosopher to take such a position. In many ways, his views are representative of the generation of Hegelian Marxists who sought to reanimate Soviet philosophical culture in the post-Stalin era. These thinkers typically adopted a strongly socio-historical view of mind that they deemed inconsistent with brainism.³ But Ilyenkov's contribution was distinctive. He, more than anyone, sought to link philosophical controversies about mind and brain to social and political issues. He was adamant that Soviet fascination with artificial intelligence and cybernetics was a symptom of a growing cult of technology that looked to the development of science to solve socio-economic problems, thereby distracting attention from their true source.⁴ He also sought to bring the issues to a wide audience by writing in a lively, accessible style, and publishing not just in philosophical journals, but in popular books and newspapers.⁵

Ilyenkov was especially concerned about the influence of brainism in the domain of education. He thought it would be disastrous for teachers to see education as a matter of training brains. He feared such a view would not only misrepresent the educational process, it would encourage nativist ideas about students' potential to learn. Since the brain's capacities are determined by its physical organisation, and since that organisation is in part determined by genetic considerations, a brain's capacity to learn must be constrained by innate factors. This seems to compel the conclusion that whether someone is intelligent, whether she is talented or 'gifted', how much she can benefit from some or other programme, and so on, is a function of the kind of brain she has. Ilyenkov felt that such reasoning only leads educators to blame children's failure to learn on their supposedly innate abilities, or lack of them, when the real culprit lies in the education system (Ilyenkov, 2002, pp. 76–77). It also encourages the idea that a future brain science might enable us to stream students for specialised programmes in light of their innate abilities, a strategy that, as Ilyenkov was quick to point out, is at odds with Marxism's commitment to abolish the division of labour for the cultivation of 'all-round individuals' (Ilyenkov, 1968b, pp. 147–51). In contrast, Ilyenkov urged that we liberate ourselves from the idea that a normal child's developmental trajectory is significantly predetermined by genetic factors. He embraced a thorough-going 'nurturism', maintaining that a child's capacity to learn has unlimited horizons and that we should educate for people's all-round development. If something goes awry in the learning process, we should look for social, rather than biological, causes.

Especially in his more popular writings, Ilyenkov adopted a strident polemical style and made abundantly clear that he deemed his opponents' views pernicious and reactionary. His opponents, of course, thought that the shoe was on the other foot (see Dubrovskii, 1968; 1990, pp. 6–9). They deemed it inappropriate of Ilyenkov to suggest that brainism was inconsistent with Marxism. After all, Marxists are materialists, and the

obvious materialist approach to mind is to recognise that mental processes are brain processes. In any case, it is manifestly unscientific for philosophers to declare that neuroscience and cognate disciplines have nothing to tell us about our mental lives. It is an empirical matter whether, say, the capacity to learn is significantly influenced by genetic factors, so philosophers are in no position to pronounce on the matter. To disregard empirical research and embrace extreme nurturism on *a priori* grounds is not just unscientific; it is utopian, idealistic and patently absurd.

Ilyenkov was undeterred, insisting that: ‘The *substance* of mind is always the life-activity [of a person] . . . and the brain with its innate structure is only its biological *substrate*. Therefore, studying the brain has as little to do with studying the mind as investigating the nature of money by analyzing the physical composition of the material (gold, silver, paper) in which the monetary form of value is realized’ (Ilyenkov, 2002, p. 98).

2

Some forty years have passed since this controversy played out in the Soviet Union. The USSR is no more, and Marxist philosophy is distinctly out of fashion. Ilyenkov is long dead; he committed suicide in 1979. Philosophy of mind, cognitive science, neuroscience and evolutionary biology have been busy—very busy—in the intervening years. So why begin this article by describing a thinker so remote from the contemporary scene?

It is striking, however, that for all that has changed, much remains the same. The problems that exercised Ilyenkov remain with us, and in many respects we are no closer to resolving them. Consider, for example, the jointly-authored book *Neuroscience and Philosophy*, published in 2007. In this text, neuroscientist Maxwell Bennett and philosopher Peter Hacker maintain, as Ilyenkov did, that psychological attributes cannot be ascribed to the brain. They argue that it makes no sense to say that a brain thinks or reasons, decides or remembers. Such things are done by people, not brains. In response, the philosophers Daniel Dennett and John Searle argue, in their respective ways, that Bennett and Hacker are wrong. Searle holds that consciousness is a biological phenomenon caused by the brain and that mental states exist in the brain. Dennett argues that attributing psychological predicates to sub-personal brain systems has produced genuinely explanatory cognitive-scientific theories, and if, as Dennett puts it, such a strategy ‘lets us see how on earth to get whole wonderful persons out of brute mechanical parts’ (Bennett *et al.*, 2007, p. 89), who is the philosopher to say that such attributions make no sense? In response, Bennett and Hacker deny that cognitive science lets us see anything of the kind and disdain Searle’s idea that the brain causes consciousness. This discussion would be very familiar to Ilyenkov, as would the acrimonious tone that sometimes creeps into it. Bennett and Hacker write of neuroscientists ‘fostering a form of mystification and cultivating a

neuro-mythology that is altogether deplorable' (p. 47); Dennett describes their philosophical methods as 'deeply reactionary' (p. 92).⁶

Ilyenkov would also find sadly familiar the burgeoning literature on the relevance of neuroscience to teaching and learning. The most comprehensive summary of how contemporary brain science can inform education is Sarah-Jayne Blakemore and Uta Frith's *The Learning Brain: Lessons for Education*. Although the authors are enthusiasts for their discipline, speculating that 'in the future there will be all sorts of new and radically different ways to increase the brain's potential to learn' (Blakemore and Frith, 2005, p. 167), it must be said that the concrete educational recommendations issuing from the research they review are remarkably modest. Some examples:

One clear implication for education from this research [on grammatical processing in the brain] is that there *may be* a finite time for the most efficient type of grammar learning. After the age of 13, we will still be able to learn grammar, but we will *probably* be less efficient and use different brain strategies than if we had learned grammar earlier (p. 47, my emphasis).

[Research on the adolescent brain suggests that if] 0–3 years is seen as a major opportunity for teaching, so should 10–15 years. During both periods, particularly dramatic brain reorganization is taking place. This *may well be* a signal that learning in certain domains is becoming ultrafast during these periods (p. 121, my emphasis).

[Research on brain mechanisms underlying imitation (specifically mirror neurons) suggests that] [l]earning from observation is *usually* easier than learning from verbal descriptions, however precise and detailed the descriptions may be. This *might be* because, by observing an action, your brain has already prepared to copy it. . . . In education, imitating attitudes, mentalities, and emotions *may be* more important than imitating simple movements (pp. 161–3, my emphasis).

[Research on brain activity during sleep suggests that] it *may be* a good idea to take a nap after learning . . . [and that] learning sessions could also be scheduled in the evening, permitting the beneficial aspects of sleep to improve the performance of the learned tasks (pp. 175–6, my emphasis).

However, notwithstanding the underwhelming character of these conclusions, Blakemore and Frith's book paints an engaging picture of a young science uncovering numerous thought-provoking findings some of which certainly appear to have application to educational matters. This is especially true of research into the neurophysiological basis of conditions that impede learning, such as dyslexia and autism.⁷

As is evident from the claims quoted above, Blakemore and Frith are under no illusions about the need for caution in making educational recommendations on the basis of the present state of research. Such caution, however, is not shown by many proponents of 'brain-based

education', who are quick to invoke contemporary neuroscience to recommend 'brain-based curricula' and 'brain-compatible learning programs' (see, e.g., Jensen, 2008). Although Blakemore and Frith ignore this literature, suggesting they give it no credence, others have been unable to suffer in silence. John Bruer, for example, has criticised brain-based education since its inception (see, e.g., Bruer, 1997, 2002). Bruer rightly complains that 'the brain-based education literature is produced not by neuroscientists but by educators and educational consultants'. Though they purport to ground their conclusions and recommendations on science, 'the primary "scientific" sources cited in this literature are popular books written by neuroscientists and journalists' (Bruer, 2002, p. 1031). From these sources, they make cavalier inferences from premises about brain structure to conclusions about brain-functioning. The result is 'at best ... no more than a folk-theory about the brain and learning' dressed up as science (p. 1032).

Ilyenkov would have applauded Bruer's stand. The worry about brain-based education is that pop-scientific speculation, grounded more in prejudice than science, might significantly influence educational policy, and this is exactly what concerned Ilyenkov, albeit in a very different political context. Of course, Ilyenkov would go further than Bruer. For one thing, Bruer does not question the potential relevance of brain science to education. He just thinks that, as things stand, serious scientific 'research on applications of brain science to general education is non-existent' (ibid.). Moreover, Ilyenkov would fault, not just brain-based education, but the more scholarly work of Frith and Blakemore. He would complain that, when they write that 'the brain has evolved to educate and to be educated'; that it 'acquires and lays down information and skills'; that it 'learns new information and deals with it throughout life'; that it is 'our natural mechanism that places limits on learning', determining 'what can be learned, how much, and how fast', Blakemore and Frith foster the view that the real focus of education is brains, not people (Blakemore and Frith, 2005, p. 1). It is significant that from the very outset, their language is one of *limits* to learning, and that they portray education in terms of an engineering metaphor: education as landscaping (see p. 10). Finally, for all their caution, Blakemore and Frith are not immune from utopian speculation, remarking that '[p]erhaps one day it will be possible to pop a pill to learn!' (p. 167). All this would have provoked Ilyenkov.

No doubt Blakemore and Frith would protest that their view of education does not focus on brains at the expense of learners. On the contrary, the metaphor of landscaping is supposed to evoke the image of gardening, of cultivating the brain's powers so that *learners* should flourish. Their talk of limits is balanced by the desire to exploit neuroscience to maximise everyone's potential to learn. At best, Ilyenkov's complaints are superficial, pertaining to infelicities of language rather than to matters of substance. I suspect, however, that Ilyenkov would have deemed their language indicative of a certain scientific style of thinking that inevitably influences, perhaps tacitly, the setting of research priorities, the identification of research topics and the

categorisation of objects of inquiry. The best way to guard against this influence is to abandon the pretence that studying the brain is studying the mind at all.

As we have seen, Ilyenkov rejects brainism in favour of what we might call ‘personalism’ about the mental, the view that psychological attributes are properties of persons, not brains. This is a view endorsed by a number of prominent Western thinkers, including Peter Hacker, whom I mentioned above, and John McDowell. In what follows, I examine the case for personalism and consider how its truth might bear on the relevance of brain science to education. It is not difficult to understand what a philosopher takes herself to be claiming when she claims that mental states are brain states or that consciousness is caused by the brain. These claims might turn out to be ultimately incomprehensible, but it is easy to grasp what their advocates are trying to say. It is also not hard to understand why brain-functioning might be thought relevant to question of education. The science described in Blakemore and Frith’s book is intellectually demanding, but the book’s claims are not conceptually challenging. The kind of view Ilyenkov favours, however, is not as intuitively plausible as his opponents’ positions appear to be and it is easily misunderstood and misrepresented.⁸ So my aim in this paper is to do the best for it I can.

3

It is important to underline that personalism is not a form of dualism of the Cartesian variety. When the personalist denies that the brain thinks, or that mental states are in the brain, she is not claiming that thoughts reside in some immaterial substance or non-material organ of thought. The point is that mental states and processes are states of whole persons and persons are material things—human beings—who are inhabitants of the natural world. It is ‘I’, David Bakhurst, who sees, hears, imagines, infers, speculates, hopes, intends, wants, reasons and so on, not my brain or any other part of me. It is also critical that the personalist does not deny that the proper functioning of a person’s brain is a precondition for her having a mental life and that neuroscience may be able to establish significant correlations, perhaps to a high degree of detail, between particular events in the brain and the occurrence of certain mental phenomena, and between activity in certain areas of the brain and the possession or exercise of certain abilities and skills. But to establish a correlation is one thing, to affirm some kind of identity another. Brain functioning enables mind-*edness*, but is not constitutive of it. Or so the personalist maintains.

What, then, is the *argument* that psychological ascriptions can be made of persons but not brains? According to Bennett and Hacker, whether psychological states can be ascribed to the brain is not a question of fact, but a conceptual issue that precedes empirical enquiry (see Bennett *et al.*, 2007, pp. 15–33, 127–56). They maintain that it is incoherent to use psychological predicates of anything other than persons. Following

Wittgenstein, Bennett and Hacker argue that the meaning of an expression is determined by the conditions of its use. But the rules for the use of psychological expressions make no reference whatsoever to what is going on in the brain. You do not have to know anything about what is happening in someone's brain to be able to say of them that they believe it is Tuesday, or that they are deciding what to have for dinner, or that they are day-dreaming about Grenada. Indeed, a person can have an excellent mastery of psychological discourse while knowing nothing about the brain and its relation to our mental lives (this was, after all, true of Aristotle). Psychological predicates are applied to creatures in light of their behaviour as they actively engage with their environment and with each other. Bennett and Hacker write: '[T]he *concept* of consciousness is bound up with the behavioural grounds for ascribing consciousness' to an animal. 'An animal does not have to exhibit such behaviour in order for it *to be* conscious. But only an animal to which such behaviour *can intelligibly be ascribed* can also be said, *either truly or falsely*, to be conscious' (p. 135), and the same goes for other psychological states and processes. Since the brain does not engage in behaviour in the relevant sense, and its processes are unobservable to most speakers, it is simply not a candidate for the possession of psychological attributes. If we apply such terms to the brain, we do so derivatively and in a way parasitic upon ordinary psychological discourse. Of course, nothing prevents scientists from using psychological expressions metaphorically, or from coining novel usages, but as Bennett and Hacker think they can show, neuroscientists and cognitive scientists typically presuppose that they are using psychological expressions literally.

How good is this argument? Bennett and Hacker's critics see it as a futile throwback to ordinary language philosophy. Searle argues that they confuse the criteria for the use of psychological expressions with what these expressions pick out. Although we attribute a psychological state to someone on the basis of behavioural evidence, *what it is* that we are attributing to her is, we now know, a brain state (Bennett *et al.*, 2007, pp. 101–06). Dennett, who is more sympathetic to the view that meaning is tied to criteria for use, argues that if ascribing psychological expressions to the brain yields explanatory theories, then the philosopher is in no position to declare the practice illegitimate. Cognitive science has indeed produced fertile theories by assuming that brains or their parts behave in ways that can usefully be described as 'thinking', 'remembering', etc. If there is a doubt about the coherence of these theories it must be established by close examination of the theories themselves, rather than general considerations about the rules for the use of words. In any case, Dennett comments, what are these rules? As Wittgenstein himself well understood, we are unable to state the rules for the use of most expressions, so philosophers only embarrass themselves by pretending to be the self-appointed guardians of the legitimate use of words (pp. 74–95).

I think Ilyenkov, who was no fan of linguistic philosophy, would agree that personalism cannot be established by appeal to considerations about the meaning of psychological terms. A different style of argument

favoured by the Russians starts from the claim that if you open up a person's cranium and look in their brain, you do not find mental images, sensations, beliefs, intentions and so on (e.g., Ilyenkov, 1974, p. 54, and 1977a, p. 73); Mikhailov, 1980, pp. 115–42). At best, all we can observe in the brain are *correlates* of mental processes.⁹ What is the basis for this claim? Why deny that brain-imaging techniques allow us to observe mental processes themselves? It might be thought that the personalist is making an argument reminiscent of Thomas Nagel's famous paper 'What is it Like to Be a Bat?' (Nagel, 1979). This is the idea that occurrent mental states have a qualitative dimension. They have a subjective, phenomenological quality. Although we might be able to observe what is going on in a person's brain when she sees a red flag, we cannot observe *what it is like* for her to see it. The subjective dimension, which some claim to be an essential characteristic of conscious mental states, goes missing in any third-personal, physical description of brain states. Hence, we might conclude, all that is observable are the neural correlates of mental activity, not mental activity itself.

The personalist agrees with this conclusion, but I think she takes a different route to it, one that does not depend on considerations of phenomenology. She is more likely to begin from the premise that the human mind is a psychological unity.¹⁰ A person's mental states are not just a rag-bag collection of representations. Any mental state has a place in a network of mental states. They form a unified system. Any new experience, any potential belief, any new intention or desire, must be evaluated in light of its fit with the subject's existing mental states. I can only adopt a new belief if it is consistent with what I already believe, and if it is plausible in light of my existing conceptions. I should only form the intention to do A, if doing A is consistent with my commitments and projects, or if I am willing to revise those commitments in projects to accommodate the action. The possibility of a network of mental states depends on two unifying factors. First, my mental states are unified because they are all states of a particular person, me. Second, they are unified in that they express my orientation to the world, which comprises both a conception of how the world is and commitments to change the world in various ways through action. It follows that if we are to understand the unity of a mental life we have to think of the person, rather than any of her parts, as the legitimate subject of psychological ascription, for it is the person that has an orientation to the world manifest in action, not her brain.¹¹

One way to put this argument about psychological unity is to say that brainism struggles to make sense of the first-person perspective. A person does not typically stand to her own mental states as to objects of observation. If I ask myself what I believe about something, I do not determine the answer by observing the contents of my mind and coming across the relevant belief, as if surveying exhibits in a museum. I determine it by making up my mind what to think in light of the evidence as I understand it. The attitude we take to our own mental lives is one of agency: we are the authors of our orientation to the world, responsible for what we think and do and our attitude to our own beliefs is never one of

passive observation (see Moran, 2001). Indeed, even in cases where our minds are passive recipients, as they are in perception, we are nevertheless under a standing obligation to evaluate the veracity of what we take ourselves to see, hear and so on. Although we can observe the world, our observing of it is always charged with agency. But although a person does not relate to the contents of her mind as to objects of observation, her relation to her own brain states, as revealed, say, by MRI imaging, *is* one of observation. Thus what she observes when she observes events in her own brain can only be brain events correlated with, and enabling of, her mental life, not her mental life itself.¹²

4

The personalist's objective, as John McDowell puts it, is:

... to restore us to a conception of thinking as an exercise of powers possessed, not mysteriously by some part of a thinking being, a part whose internal arrangements are characterizable independently of how the thinking being is placed in its environment, but unambiguously by a thinking being itself, an animal that lives its life in cognitive and practical relations to the world (McDowell, 1998, p. 289).

Both McDowell and Ilyenkov supplement their personalism with a distinctive view of human development. On this conception, the human child first lives a purely animal mode of existence; that is, her bodily functions, including her psychological functions, answer exclusively to biological imperatives—for food, warmth, comfort, etc. At this stage, we might say that the child's psychological functions are unified by the satisfaction of biological need, rather than by the maintenance of an orientation, cognitive and practical to the world. As the child matures, however, she undergoes a qualitative transformation. She enters a distinctively human, essentially social form of life and acquires distinctively human psychological capacities that enable her to transcend existence in the narrow confines of a biological environment and to hold the world in view. With this, natural-scientific modes of explanation are no longer adequate to explain the character of the child's mindedness.

Exactly what is it about the mature human mind that resists explanation in scientific terms? When Ilyenkov characterises the distinctive character of human thought, his emphasis is always on creativity, universality and unpredictability. Ilyenkov's point is that the human mind is universal in that it is in principle open to *any* subject-matter (Ilyenkov, 1974, pp. 38–39, and 1977a, p. 53). It is able to grapple with and solve hitherto-unencountered problems. The human mind constantly transcends its own limits; it does not simply apply old techniques to new problems. On the contrary, we set ourselves problems precisely to develop the methods to address them, a process that in turn uncovers new questions, creating new problem-spaces demanding further innovation and so on. To understand this dialectical process, we cannot represent the mind as determined by

antecedent conditions. If it is determined by anything, it is by the logic of the subject-matter it confronts (Ilyenkov, 2002, pp. 105–06). But if it is to conform itself to an evolving, ever-novel object, the mind must be able to transcend rules and principles that formerly governed its operation. The human mind is not rule-bound. It follows that since the brain is a physical thing operating according to physical laws, its operations cannot be all there is to the life of the mind. A machine, even an astonishingly complex biological machine, can only do what it has been programmed to do by evolution or design. No machine can be truly universal in the way that human minds are universal.

This argument is harder to sustain today than it was in Ilyenkov's time. We are now familiar with computers capable of learning and of forming creative solutions to problems. So the idea that computers are rule-bound in a way that human beings are not lacks the intuitive plausibility it had in the early days of artificial intelligence and cybernetics. So Ilyenkov's opponents will likely dismiss his argument as no more than a misplaced affirmation of humanism.

Ilyenkov's remarks can be redeemed, however, if we bring into play something he largely omits from discussion: rationality. As I observed above, McDowell, like Ilyenkov, argues that human beings 'are born mere animals, and they are transformed into thinkers and intentional agents in the course of coming to maturity' (McDowell, 1994, p. 125). But McDowell makes very clear that human beings' distinctive psychological powers reside in their *responsiveness to reasons*. Human beings think and act in light of the reasons for so doing and their behaviour can be explained only with this perspective in view. Critical to McDowell's view is a distinction, ultimately derived from Kant, between two species of explanation or 'modes of intelligibility'. On the one hand, there is explanation by appeal to scientific law; on the other, there is explanation by appeal to reasons. The explanation of why Harry tripped over the carpet appeals to the physical conditions that were causally sufficient for the accident to occur. In contrast, we explain why Harry opened the door by appeal to his reasons for so doing: we attempt to show the favourable light in which he saw the action. In like manner, we explain what Harry believes by appeal to what it is most reasonable for him to think in light of the evidence, his situation and his existing beliefs, on the assumption that he is rational. These two species of explanation, rational and causal, are fundamentally different in kind.¹³ The relations in which rational explanation deals are normative in character. When I decide that Jack must believe that *q* because he believes (a) that *p* and (b) that *p* entails *q*, I am not making a causal claim. I am assuming that Jack believes what he ought to believe if he is rational.

Earlier, I described the mind as a psychological unity. The relations that unite mental phenomena into a system are precisely normative, rational relations of entailment, probability, plausibility and so on. These are not the sort of relations that are characterised by natural-scientific theories. The language in which we describe and explain mental events and processes, and the constraints that govern those explanations, are

fundamentally different in character from the language of natural science. What goes on in the brain is exhaustively open to scientific explanation. The brain is within the realm of scientific law. But mental states and processes occupy a different logical space—the space of reasons. Since there is no possibility of reducing the items that occupy the space of reasons to those that populate the realm of law, it follows that psychological talk represents a fundamentally different discourse from talk of the brain, and these discourses have fundamentally different subjects.¹⁴

With this view of rationality in place, we can say that the qualitative transformation in the child occurs when it becomes an inhabitant of the space of reasons, a being whose life-activity must be understood by appeal to rational, rather than merely causal-scientific, considerations.¹⁵ For McDowell, what is crucial is the acquisition of conceptual capacities. These enable the child to have perceptual experiences of a kind that have a rational bearing on judgement, and to entertain mental states of a kind that can stand in articulate rational relations with one another. Such a creature is a rational agent, a person. This conception of development consolidates the view that the person is the centrepiece of rational explanation, not her brain. It is persons whose beliefs are consistent or inconsistent, who act reasonably or unreasonably, who argue perceptively or stupidly, who judge carefully or precipitously.

It may seem that these considerations about reason and rationality are at some remove from the Ilyenkovian thoughts about creativity and universality that they were meant to redeem, but they are not. It is a presumption of rational explanation that agents are free and hence responsible for their thoughts and actions. Creatures capable of conceptual thought governed by norms of rationality are able to commune with the universal, first, in the sense that concepts can have universal content and, second, in the sense that there is no limit to what we can entertain in thought (of course there can be empirical limits to what we can entertain in thought, but there is no restriction of subject-matter built into the very nature of thought itself). Finally, rational explanation is tolerant of novelty and creativity: it enables us to see how someone derived a novel solution to a problem without representing its derivation as merely a piecing together of that which was already to hand. Even where judgement is compelled by rational necessity—where a person realises that there is nothing else to think but *p*—creativity may be required to perceive the significance of the considerations that compel judgement. This kind of creative insight can be understood and appreciated; it cannot itself be represented as necessitated by circumstance, or anticipated by substantive rules or procedures. Rational explanation is at ease with this.¹⁶

It is worth observing that although Ilyenkov and McDowell paint a similar picture of human development, there are marked differences in their views. McDowell links the acquisition of conceptual capacities to the learning of a first language. Ilyenkov, in contrast, argues that language learning is possible only once the child has already entered the human world by learning to interact with artefacts. Ilyenkov holds that the

physical form of an artefact embodies the purposes for which it is used. Acquiring facility with artefacts is therefore a matter of coming to respond to a meaningful object, adapting to the 'ideal' form expressed by its physical form. The child inhabits a social world, not just because she constantly interacts with other people (indeed, she is dependent on others for her very survival), but because her world is full of objects created by human beings for human purposes. Learning to negotiate this world is the child's entrance into the space of reasons, for to interact with the artefactual is to engage in activities that are not just elicited by circumstance but mediated by meaning. So the child enters the human world, the world of meaning. Language, for Ilyenkov, is just another artefact, albeit it a supremely complex and sophisticated one.¹⁷

5

We have now considered some of the central arguments for personalism.¹⁸ In conclusion, I shall examine the bearing of these arguments on the relevance of neuroscience to educational issues.

It is sometimes argued that although there are significant constraints on the extent to which brain science can illuminate learning, it does have a role in the explanation of dysfunction, deficit and disorder (see Davis, 2004, p. 31; Changeux and Ricoeur, 2000, p. 49). Reflecting on the distinction between rational and causal explanation can explain why this position seems attractive. Where learning is proceeding smoothly, we view the child from the perspective of rationality: she is a rational agent gradually taking command of some subject-matter by coming to understand and appreciate the reasons for which she should form certain beliefs, make certain inferences, engage in certain practices and so on. If the child encounters obstacles to learning, we try at first to explain this rationally. So, for example, we might propose that the child cannot see that she should infer that *q*, because she is missing some vital piece of information. Once she understands that *p*, then she will quickly realise that *q* But sometimes we decide that such rational considerations cannot explain the child's difficulty. Her problem is not just that she lacks information or understanding in a way that is consistent with our viewing her as a rational agent. Her problem is of a different order. We then look for a causal explanation. Appeal to learning disabilities provides explanations of this kind. Such causal explanations look for underlying mechanisms, and in many cases it makes perfect sense to think that these might be a matter of brain functioning. It is plausible to suppose, for instance, that the particular challenges faced by people with Asperger's Syndrome have their basis in the way their brains work.¹⁹ Once we adopt the causal perspective on the child's problems, we cease to see her as a rational agent, at least in this respect, and absolve her from responsibility, and hence blame, for her failings.

Yet why should we conclude that brain science is only good for explaining obstacles to learning? Why cannot brain science illuminate why

someone is especially good at some practice? Admittedly, the explanation of why someone made some inference, or gave some excellent explanation, or solved some problem a certain way, will be a rational one, reconstructing the 'logic' of the achievement. But the explanation of why the person in question is particularly adept at this sort of thing—of her speed of thought, or her talent for seeing unusual connections—need not invoke rational considerations. It will speak to the causal preconditions of her rational powers. Why should we suppose, as Ilyenkov asks us to, that the only relevant neurophysiological fact is that her brain is functioning normally? Surely we can aspire to a fine-grained explanation of exactly what it is about the way her brain functions that enables her to excel as she does.

Ilyenkov insists that only social factors are relevant to the explanation of ability and achievement. Why? Consider the role that the social plays in Ilyenkov's and McDowell's respective accounts of the child's entrance into the space of reasons. McDowell gives pride of place to the child's acquisition of language, but he treats language, not just as a symbolic system, but also as a living embodiment of cultural wisdom, so that the child's acquiring a first language represents her initiation into styles of thinking and reasoning. He writes that 'the language into which a human being is first initiated stands over against her as a prior embodiment of mindedness, of the possibility of an orientation to the world . . . [Language is] a repository of tradition, a store of historically accumulated wisdom about what is a reason for what' (McDowell, 1994, pp. 125–26). Acquiring a language, so conceived, is acquiring a form of social life. Ilyenkov, as we observed, stresses that our form of life is embodied, not just in linguistic thought and talk, but in the very form the world takes in virtue of human interaction with nature. Our world is one 'humanized' by our activity, populated by created objects that are embodiments of meaning and purpose. The first step to becoming human is to learn to manipulate such objects in light of the 'ideal form' they have been lent by human agency. And it is not just that initiation into social forms of life kick-starts our mindedness. The life of the mind is lived in social space, mediated by forms of thought and inquiry that are essentially sustained by social practices.

Yet, notwithstanding the prominence both thinkers accord to the social, nothing in their arguments suggests that we should embrace a nurturism as thoroughgoing as Ilyenkov's. They provide no reason to assume *a priori* that causal factors relevant to explaining *this* person's musical ability, or *that* person's proneness to anxiety, are all social. In the absence of real empirical evidence, that assumption can be based only on wishful thinking, on the hope that social factors can be controlled and improved in the way biological factors cannot be. Of course, there is as much reason to avoid crass biological determinism as there is to eschew *a priori* nurturism. It is critical to recognise that even though the acquisition and exercise of an ability (say, to sing a major scale) is enabled by biological factors, some of which may be innate, the ability itself is possessed by the person, not her brain. Moreover, *what* it is an ability to do is intelligible only in light of socio-historical considerations, and its acquisition must be seen as the appropriation of a social practice. Proper appreciation of these

points gives the lie to any simple picture of abilities as ‘hard-wired’. But there is no reason to claim, as Ilyenkov did, that we can ‘divide through’ by biological considerations when considering the developmental trajectory of ‘normal’ brains.

I conclude that, even if personalism is true and psychological attributes cannot be legitimately ascribed to the brain, neuroscience remains relevant to understanding the brain processes that enable and facilitate our mental lives. There are no *a priori* grounds to declare brain science irrelevant to educational issues, or relevant only in ‘deficit’ cases. What is critical, however, is that interest in the brain should not distract attention from the fact that education is a communicative endeavour, not an engineering problem. Education is not about getting information into students’ heads or of implanting skills in them. Learning history, for example, is a matter of acquiring facility with a discipline aspiring to critical self-consciousness about our relation to the past. Though a command of facts and skills of analysis are preconditions of historical understanding, they are not what that understanding consists in. This is not true only of high-brow humanities disciplines. When we teach carpentry we are, or ought to be, introducing students to a craft, to a historically-evolving tradition of fashioning wood to make artefacts for various purposes. Once again, information and skills are not all that is at issue. Machines may possess those, or close surrogates, but machines have no practices and crafts. We must never lose sight of the wider communicative endeavour that is the heart of education: the meeting of minds in an encounter with a discipline.

Perhaps these reflections sound old-fashioned and high-minded. But I am amazed at the naiveté of scholars who ponder the possibility of ‘popping a pill to learn’. If we object to athletes using performance-enhancing drugs, why should we welcome pharmaceutical ways of enhancing learning? If we stop students taking computers into examinations on which they have downloaded texts, should we look more favourably on the prospect of their downloading material directly into their brains? Such questions, however fanciful, raise ethical issues that force us to confront the issue of what education is and ought to be. My point is a familiar one: we must not let excitement about scientific innovation and technological possibility distort our conception of education and of the values it ought to embody. Above all else, this was the message that Ilyenkov sought to convey in his writings on education. Though many years have passed since he put pen to paper, this message is as relevant today as it ever was. I suspect it will remain so long into the future.

Correspondence: David Bakhurst, Department of Philosophy, Queen’s University, Kingston, Ontario K7L 3N6, Canada.
E-mail: david.bakhurst@queensu.ca

NOTES

1. I owe the term ‘brainism’ to my colleague E. J. Bond. As I define it in the text, the term serves well to characterise Ilyenkov’s target. Ilyenkov himself sometimes describes himself as attacking

'naturalism' about the mind, but even though this is in keeping with how the term subsequently came to be used in Western philosophy of mind, it is not ideal, since there is a clear sense in which Ilyenkov himself embraces a form of naturalism, albeit one more expansive than his opponents'. 'Reductionism' about the mental is too narrow to describe Ilyenkov's target, since he would reject some forms of non-reductive physicalism, as well as eliminative materialism (which, despairing of reducing the mental to the physical, proposes to displace our 'folk psychological' idioms altogether). 'Physicalism' is too broad a term, since there is a huge variety of physicalist views of mind. For example, Ilyenkov would have rejected both traditional identity theory, which holds that for each type of mental state there is a type of physical state with which it is identical, and functionalist theories (the orthodoxy in contemporary cognitive science), according to which mental states are identified with their functional roles, the latter being portrayed as realised by causal processes in the brain. But Ilyenkov might have tolerated *some* versions of non-reductive physicalism. It is important to realise that Ilyenkov did not work at a high level of philosophical resolution, pondering the fine detail of nuanced positions in the philosophy of mind. Rather, he was concerned with our most basic conceptions of the nature of mind and his target was any view that casts the brain as the location of thought. Hence 'brainism' is as good a term as any to describe his *bête noire*.

2. The translation of the quoted remark is not entirely straightforward. First, the Russian '*chelovek*' serves for both 'human beings' and 'person' (the term has rich etymological associations, suggesting a being whose 'face is turned towards the infinite'). However, the potential ambiguity is of no consequence in this context, since Ilyenkov would hold that the paradigm of a person is a living human being. More problematic is the expression '*s pomoshch'iu*'. The literal translation, 'with the help of', is awkward, but so are the alternatives 'by means of', 'with', or 'using', none of which seem wholly appropriate to characterise a person's relation to her brain. This is perhaps only to be expected. If we deny that we can construe the mental in terms of brain functioning, we should not suppose that we will be able to represent the relation of person and brain on the model of some familiar relation, such as a person's relation to a tool. It should not surprise us that the relation is a singular one, in some respects like other relations, and in other ways unique and elusive.
3. Witness Felix Mikhailov's *The Riddle of the Self* (first published in 1964), and the work of psychologists of the Vygotsky school such as A. N. Leontiev and V. V. Davydov (see Levitin, 1982).
4. Of course, in the Soviet political context Ilyenkov had to be extremely cautious in making such points, often casting them as criticisms of *Western* society, but the sub-text would have been clear to many Soviet readers.
5. Ilyenkov's more scholarly treatments of the issue are Ilyenkov, 1974, Chapter 8 (1977a, Chapter 8) and 1984. Ilyenkov, 1968b is a good example of his polemical writing. Writings on education include Ilyenkov, 1964, 1977b/1991 and 2002, the latter containing six previously unpublished papers. Ilyenkov, 1968a is a lively book-length treatment that integrates themes from the philosophies of mind and education. Ilyenkov, 1970, 1975 and 2002 (pp. 95–106) discuss the philosophical significance of Meshcheryakov's work on the education of blind-deaf individuals. I examine Ilyenkov's conception of mind in Bakhurst, 1991: especially, Chapters 6–7, and in a number of subsequent articles, including Bakhurst, 1997 and 2005a. Bakhurst, 2005b, discusses his philosophy of education, and Bakhurst and Padden, 1991, examines his treatment of Meshcheryakov's contribution.
6. *Neuroscience and Philosophy* issued from an 'Author and Critics' session at an American Philosophical Association conference in 2005 that discussed Bennett and Hacker's, *Philosophical Foundations of Neuroscience* (2003), a book that gives a comprehensive statement of their position and includes substantial appendices criticising Dennett and Searle.
7. In these cases, what is contentious is not the potential relevance of brain science but the characterisation of the conditions themselves. For example, although we are now used to thinking in terms of an 'autistic spectrum', it is by no means clear that there is a single spectrum rather than, say, a cluster of related conditions or behaviours. Such questions of typology are profound and neuroscientific data is unquestionably relevant to resolving them.
8. In Ilyenkov's case, his strident polemical tone, and the incautious way he attacks his opponents, positively invite an uncharitable reading. It is important to step back from the heat of the controversy take a sober look at the best of the arguments.

9. Bennett and Hacker make a similar point: 'After all, the only thing neuroscientists *could* discover is that certain neural states are inductively well correlated with, and causal conditions of, an *animal's* being conscious. But *that* discovery cannot show that it is *the brain* that is conscious' (Bennett *et al.*, 2007, p.136).
10. It is not that significant psychological disunity is impossible, just that it must be understood as a departure from the norm.
11. It was Kant who brought to prominence the question of the preconditions of psychological unity with his treatment of the transcendental unity of apperception. Kant held that the self that secured such unity was purely formal in nature. This, he believed, was the only alternative to Cartesianism. But Kant failed to see the possibility of taking persons—real living human beings—as genuine psychological subjects. See the excellent discussion in McDowell, 1994, pp. 99–104.
12. It is worth noting an important contrast with Nagel's argument in 'What is it Like to Be a Bat?'. That argument trades on the idea that there is a feature of the mental—namely its subjective phenomenology—that cannot be observed from a third-person perspective. Since physicalist accounts are cast from a third-person perspective, they will always fail to capture a crucial aspect of the mental. The personalist, in contrast, does not depend on the limitations of the third-personal perspective. Indeed, she can hold that much of our mental life is observable from a third-person perspective because it is manifest in the life-activity of the subject. The personalist's point is that the first-person perspective on the mental is not one of observation but agency, and this precludes a person adopting an attitude to her own mental states as if from the third-person (except perhaps in certain unusual circumstances). Our brain states, in contrast, are possible objects of observation.
13. McDowell prefers to cast the distinction as one between rational and scientific explanation because he does not want to make the scientific-naturalist a gift of the concept of causation. He wants to leave open the possibility that rational explanation can be genuinely causal. Conversely, not all scientific explanation is strictly causal in character. However, the rational/causal distinction will do for present purposes, so long as we bear these subtleties in mind.
14. Those who know the work of Donald Davidson may want to resist the final step in this argument. Davidson holds that psychological and physical explanation are fundamentally different in kind, but contends that mental events are physical events (see, e.g., Davidson, 1980). Since an event can be picked out by different modes of description, we can say that any event described psychologically (e.g. my thinking of Vienna) is identical with some event that can be described physically (e.g. such-and-such neurons firing). Davidson argues that even though this particular (or 'token') mental event is the same as that particular physical event, the fundamental difference between psychological and physical modes of explanation entails that we cannot establish identities between types of mental and physical events or establish psycho-physical laws. He thus arrives at a form of non-reductive physicalism known as 'anomalous monism'. McDowell and others (e.g. Hornsby, 1997) reject anomalous monism on the grounds that we cannot assume that psychological and physical discourses individuate the same events.
15. It is interesting to speculate why Ilyenkov says little about rationality as such. I think he would have taken the rational/causal distinction for granted as a staple of post-Kantian philosophy, but avoided overt talk of reason and rationality for fear of provoking accusations of idealism, Hegelianism, or rationalism—all of which were considered heresies in Soviet philosophy.
16. The concept Ilyenkov deploys to capture the creative movement of thought is *dialectics* (see, e.g. Ilyenkov, 1964, 2002, pp. 26–34).
17. There is an interesting discussion of the significance of artefacts in his writing on the education of the blind-deaf. Reflecting on the importance of the blind-deaf child's learning to eat with a spoon, Ilyenkov writes: 'The first and most fundamental form of human mind is revealed here as the *movement of the hands according to a schema*—according to a trajectory, not defined by biological need, but by the form and situation of objects created by human labour, created by human beings for human beings' (Ilyenkov, 2002, p. 100).
18. But not all. For example, some argue the case for personalism on the basis of 'externalism' about meaning. It is sometimes argued that meaning, and hence mental content, is constituted in part by relations between the speaker/thinker and the external world. So, when I have a thought about tigers, what my thought is a thought about depends on facts about what tigers are. When I have a 'singular thought' about a particular object perceptually present to me (e.g. 'That lampshade is

ghastly'), the content of the thought depends upon the existence of the object demonstrated. Such considerations led Putnam to conclude: 'Cut the pie any way you like, "meanings" just ain't in the head!' (Putnam, 1975, p. 227). McDowell takes these ideas further, arguing that 'the moral of Putnam's basic thought for the nature of the mental might be, to put it in his terms, that the mind—the locus of our manipulations of meanings—is not in the head either. Meanings are in the mind, but, as [Putnam's] argument establishes, they cannot be in the head; therefore, we ought to conclude, the mind is not in the head' (McDowell, 1998, p. 276). McDowell takes this as an argument for personalism: 'Mental life is an aspect of *our* lives, and the idea that it takes place in the mind can, and should, be detached from the idea that there is a part of us, whether material or (supposing this made sense) immaterial, in which it takes place. Where mental life takes place need not be pinpointed any more precisely than by saying that it takes place where our lives take place. And then its states and occurrences can be no less intrinsically related to our environment than our lives are' (p. 281). (Andrew Davis explicitly discusses the bearing of externalism about meaning on the question of the relevance of brain science to education (Davis, 2004).)

19. Though, in harmony with what I say in note 7 above, I am by no means confident that Asperger's Syndrome is really a single phenomenon, nor am I impressed with the assumption that the deficit is all on the side of the person diagnosed with the syndrome. We are good at describing the respects in which those with the syndrome fail to read other people, but we fail to ask what it is about 'normal' people that makes it difficult for them to read those with Asperger's.

REFERENCES

- Arsen'ev, A. S., Ilyenkov, E. V. and Davydov, V. V. (1966) *Mashina i chelovek, kibernetika i filozofiya* ['Machine and human being, cybernetics and philosophy'], in: *Leninskaya teoriya otrazheniya i sovremennaya nauka* [Lenin's Theory of Reflection and Contemporary Science] (Moscow, Politizdat), pp. 265–285.
- Bakhurst, D. (1991) *Consciousness and Revolution in Soviet Philosophy. From the Bolsheviks to Evald Ilyenkov* (Cambridge, Cambridge University Press).
- Bakhurst, D. (1997) Meaning, Normativity, and the Life of the Mind, *Language and Communication*, 17.1, pp. 33–51.
- Bakhurst, D. (2005a) Strong Culturalism, in: D. M. Johnson and C. Erneling (eds) *The Mind as a Scientific Object: Between Brain and Culture* (New York, Oxford University Press), pp. 413–31.
- Bakhurst, D. (2005b) Ilyenkov on Education, *Studies in East European Thought*, 57.3, pp. 261–75.
- Bakhurst, D. and Padden, C. (1991) The Meshcheryakov Experiment: Soviet Work on the Education of Blind-Deaf Children, *Learning and Instruction*, 1, pp. 201–215.
- Bennett, M. and Hacker, P. (2003) *Philosophical Foundations of Neuroscience* (Oxford, Blackwell).
- Bennett, M., Dennett, D., Hacker, P. and Searle, J. (2007) *Neuroscience and Philosophy: Mind, Brain and Language* (New York, Columbia University Press).
- Blakemore, S-J. and Frith, U. (2005) *The Learning Brain: Lessons for Education* (Oxford, Blackwell).
- Bruer, J. (1997) Education and The Brain: A Bridge Too Far, *Educational Researcher*, November, pp. 1–13.
- Bruer, J. (2002) Avoiding the Pediatrician's Error: How Neuroscientists can Help Educators (and Themselves), *Nature. Neuroscience Supplement*, 5, pp. 1031–33.
- Changeux, J. and Ricoeur, P. (2000) *What Makes Us Think?* (Princeton, NJ and Oxford, Princeton University Press).
- Davidson, D. (1980) Mental Events, in his: *Essays on Action and Events* (Oxford, Oxford University Press), pp. 207–25.
- Davis, A. (2004) The Credentials of Brain-Based Learning, *Journal of Philosophy of Education*, 38.1, pp. 21–35.
- Dubrovskii, D. I. (1968) *Mozg i psikhika* [Brain and Mind], *Voprosy filosofii* [Questions of Philosophy], 8, pp. 125–35.
- Dubrovskii, D. I. (1990) *Psikhika i mozg: resul'taty i perspektivy issledovaniia* [Mind and Brain: Results and Perspectives of Research], *Psikhologicheskii zhurnal* [Journal of Psychology], 11.6, pp. 3–15.

- Hornsby, J. (1997) *Simple Mindedness: In Defense of Naive Naturalism in the Philosophy of Mind* (Cambridge, MA, Harvard University Press).
- Ilyenkov, E. V. (1964) *Shkola dolzhna učit' myslit'!* [Schools Must Teach How to Think!], *Narodnoe obrazovanie [People's Education]*, 4, pp. 2–15.
- Ilyenkov, E. V. (1968a) *Ob idolakh i idealakh [Of Idols and Ideals]* (Moscow, Politizdat).
- Ilyenkov, E. V. (1968b) *Psikhika i mozg [Mind and Brain]*, *Voprosy filosofii [Questions of Philosophy]*, 11, pp. 145–55.
- Ilyenkov, E. V. (1970) *Psikhika cheloveka pod 'lupoi vremeni' [The Human Mind Under 'The Looking Glass of Time']*, *Priroda [Nature]*, 1, pp. 87–91.
- Ilyenkov, E. V. (1974) *Dialekticheskaya logika: Ocherki istorii i teorii [Dialectical Logic: Essays in its History and Theory]* (Moscow, Politizdat).
- Ilyenkov, E. V. (1975) *Aleksandr Ivanovich Meshcherykov i ego pedagogika [Alexander Ivanovich Meshcherykov and his Pedagogy]*, *Molodoi Kommunist [Young Communist]*, 2, pp. 80–84.
- Ilyenkov, E. V. (1977a) *Dialectical Logic: Essays in its History and Theory*. Translation of Ilyenkov, 1974, by H. Campbell Creighton (Moscow, Progress).
- Ilyenkov, E. V. (1977b) *Uchites' mylit' smolodu [Learn to Think While You Are Young]* (Moscow, Znanie). (The articles comprising this pamphlet are reprinted in Ilyenkov, *Filosofiya i kul'tura* (Moscow, Politizdat, 1991) pp. 18–55.
- Ilyenkov, E. V. (1984) *Dialektika ideal'nogo [The Dialectic of the Ideal]*, in his: *Iskusstvo i kommunisticheskii ideal [Art and the Communist Ideal]* (Moscow, Iskusstvo), pp. 8–77. (First published as in two parts as (1979) *Problema ideal'nogo [The Problem of the Ideal]* in *Voprosy filosofii [Questions of Philosophy]*, 6, pp. 145–58 and 7, pp. 128–40.)).
- Ilyenkov, E. V. (2002) *Shkola dolzhna učit' myslit' [Schools Must Teach How to Think]* (Moscow-Voronezh, Isdatel'stvo NPO 'Modek').
- Jensen, E. (2008) *A Fresh Look at Brain-Based Education*, *Phi Delta Kappan*, February, pp. 409–17.
- Levitin, K. (1982) *One is not Born a Personality*, Y. Filippov, trans. (Moscow, Progress).
- McDowell, J. (1994) *Mind and World* (Cambridge, MA, Harvard University Press).
- McDowell, J. (1998) *Putnam on Mind and Meaning*, in his: *Meaning, Knowledge and Reality* (Cambridge, MA, Harvard University Press), pp. 275–91.
- Mikhailov, F. (1980) *The Riddle of the Self*, R. Daglish, trans. of the 1976 Russian edition (1st Russian edn. 1964) (Moscow, Progress).
- Moran, R. (2001) *Authority and Estrangement: An Essay on Self-Knowledge* (Princeton, NJ and Oxford, Princeton University Press).
- Nagel, T. (1979) *What is it Like to Be a Bat?*, in his: *Mortal Questions* (Cambridge, Cambridge University Press).
- Putnam, H. (1975) *The Meaning of 'Meaning'*, in his: *Mind, Language, and Reality* (Cambridge, Cambridge University Press), pp. 215–71.

Copyright of Journal of Philosophy of Education is the property of Blackwell Publishing Limited and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.