

Cognitive enhancement raises ethical concerns;

James Butcher

Doping is no longer the sole preserve of professional sports people; performance-enhancing drugs are beginning to infiltrate academic circles too. According to Martha Farah—an expert on the neurology of cognition, emotion, and development at the University of Pennsylvania’s Center for Cognitive Neuroscience —many university students are using methylphenidate (Ritalin), a drug licensed to treat attention deficit hyperactivity disorder (ADHD), to enhance their ability to focus and study.

“In my classes, everyone knows someone who is using or selling the stuff”, says Farah, “and I hasten to add that this is not unique to Penn —research shows it’s a nationwide trend.” Farah, who recently co-chaired a meeting on the ethics of cognitive enhancement (New York Academies of Science, USA; June 16–17) with conference chair Judy Illes (Stanford Center for Biomedical Ethics and Department of Radiology, Palo Alto, CA, USA), said methylphenidate is already being commonly used—many say overused—to help control unruly children in poor urban school districts in the USA.

Researchers have shown that in some schools up to a third of boys are on the drug, even though many of them do not have ADHD. But there is also evidence that many wealthier parents are now choosing to give the drug to their well behaved, though under-performing, children to enhance their classroom attention. Will the day come when students are told to hand in a urine sample along with their examination manuscript to prove that their achievements were the result of hard work and not pharmacology? Scenarios like this one were discussed at the conference by academics from many different disciplines—neuroscience, biomedical ethics, policy, law, education, and publishing. All the delegates agreed that in the next few years, healthy individuals will increasingly use drugs that improve or enhance cognitive function.

The predicted trend, however, raises serious ethical concerns about the use of chemical and mechanical forms of Will brain–computer interfaces become as contentious an issue as stem-cell research? Science Photo Library Academics urge pre-emptive debate on

neurotechnologies Cognitive enhancement raises ethical concerns neurotechnology, including psychopharmaceuticals, neuronal tissue implants, and brain–computer interfaces. Indeed, cognitive neuroscientist Lawrence Parsons, a Program Director at US grant-giving body the National Science Foundation (NSF), predicts that within the next 10 to 15 years some forms of cognitive enhancement will have become so widespread that it will be as contentious a social issue as stem-cell research and genetically modified foods are today.

“What’s coming is the wide availability of powerful, specific cognitive enhancements”, said Paul Root Wolpe, a sociologist and ethicist from the University of Pennsylvania. “We will see these on the market within a decade at the outside, and a few will begin to percolate into society substantially before that.” Wolpe thinks that the use of brain–computer interfaces for enhancement purposes in healthy individuals is still science fiction, for the foreseeable future at least, although he notes that the US military, which has made major scientific advances in the past, is pouring money into neurotechnology research. Cognitive-enhancing drugs are already in development.

Many of these new drugs will be pharmaceuticals that were originally designed to treat a medical condition, but which prove to be safe enough for widespread use off-label. However, some will be specifically designed to enhance attention or memory, for example, in people considered to be perfectly healthy. Nobel Laureate Eric Kandel, a founder of Memory Pharmaceuticals (Montvale, NJ, USA), believes that within the next 5 years several companies will have developed moderately safe drugs to counter non-Alzheimer, age-related memory loss. However, age-related memory loss is not yet classified by the US Food and Drug Administration (FDA) as a medical condition.

So, assuming the drugs work, who, if anyone, should prescribe them? Illes and Kandel believe that healthcare providers should be the ones who prescribe cognitive-enhancing products that directly affect health. However, if a drug was safe enough to sell over-the-counter, physicians would not need to be involved, she said, although they would have a duty to be informed about the state of the art to be able to advise their patients appropriately. Rights were not granted to include this image in electronic media. Please refer to the printed journal.

“Some dermatologists and cosmetic surgeons are overtly in the business of lifestyle enhancement for the healthy”, added Farah, “but neurologists and psychiatrists don’t think of themselves that way, and consequently are not trained to help people with decisions about enhancement.” But perhaps they should be. Patient safety will always be a doctor’s primary concern, especially if the drug is used to enhance, rather than to treat. Patients with cancer tolerate the side-effects of chemotherapy because of the severity of their disease, but unless cognitive-enhancing drugs can be designed that have few, if any, side-effects, they will never be widely used in the general population. But even if such drugs are safe, should their use be condoned or condemned? Ethicists worry that if cognitive enhancers were used en masse, human society, and the values it cherishes, could drastically change.

Perhaps the most worrying issue is the effect cognitive-enhancing drugs might have on social justice and equality. Illes, for instance, is concerned about what would happen if the level of “normal” cognitive performance is increased, yet only the wealthy have the means of attaining this new level of normal. “It is definitely a concern as it will have a downstream impact on education, employment, and other opportunities for both children and adults, and has the potential to change the very fabric of society”, said Illes. But as Farah pointed out, the possibility of unequal distribution is not a reason to reject neuro-cognitive enhancement outright: “Education is a cognitive enhancer that is very inequitably distributed, but society is not against education. Conversely, neurocognitive enhancers might be relatively easy to distribute widely.”

However, widespread availability may in itself cause problems if it introduces another type of risk—the creation of population homogeneity and loss of diversity. Erik Parens, a bioethicist from the Hastings Center (New York, USA), is particularly concerned about the effects that cognitive enhancers might have on cultural diversity. “Many of us comfort ourselves by thinking that such enhancements will be put to a wide variety of purposes and will ultimately promote a rich diversity of life projects”, he said. “A drug that enhanced our ‘cognition’ could in principle be used to help us memorise Shakespeare, or listen to Bach, or contemplate the meaning of being.” However, Parens very much doubts, given the state of modern society, that such enhancements will promote a diversity in human activities. Rather, he predicts that cognitive enhancers would probably be used to promote more of the same. “If you’re happy with the status quo, more of the same may sound just fine. If, however, you want to imagine how we might live differently, it won’t”, he said.

Another concern is the effect that cognitive enhancers might have on the individual and the perception of self. Wolpe pointed out that it is not only the collateral effects of neurological enhancement that are troublesome, but also the nature of the change itself. “For example, the progressive loss of cognitive function that characterises Alzheimer’s is usually described as constituting the ‘loss of personality’ of the person with the disease”, he said. “A general cognitive enhancement may have the same effect.” He worries that if we substantially improve our overall cognitive functioning, we may also alter aspects of our identity that are fundamental to who we are. Wolpe is concerned not so much about a “post-human future”, but rather a future in which we recognise ourselves as human, but others do not perceive us to be the same person we once were. For example, in most societies working hard to achieve a goal is an admired quality.

However, in the past few decades western society has become increasingly averse to suffering and many people are willing to take shortcuts rather than dedicate the time and resources that were previously needed to achieve a goal, notes Wolpe. But overcoming adversity and learning from difficult experiences contributes to what it means to be human. “Would we really want to lose that?”, he asks. Because of these ethical concerns, academics with a professional interest in cognitive enhancement need to start thinking about the implications of their research and to take responsibility for it, the delegates agreed.

The personal experiences of Howard Gardner—a professor in cognition and education at Harvard University who discovered 10 years ago that his work was being used in a racially divisive way in Australia—helped cement the idea that the responsibility of the scientist does not end when he or she publishes. “Scientists have an obligation to monitor how their work is used and misused, and to speak up regarding misapplications, misinterpretations, and frank mischief”, Gardner emphasised.

A proactive approach is especially important for research into cognitive enhancement, says Gardner, because neurotechnology will cause society to change incrementally. “By

the time that we are aware of it, it will be too late”, he said. “I think that this change is unlikely to be stoppable, but I believe that those of us who are opposed to cognitive enhancements of individuals within the normal distribution of the population should stand up and be counted. We might just make a difference.” Wolpe is more stoical: “If history is a precedent, we will enthusiastically embrace these technologies, even as we agonise over whether or not we should do so.” Should we be concerned about a Brave New World? “Ethicists worry that if cognitive enhancers were used en masse, human society, and the values it cherishes, could drastically change”

James Butcher is the former Editor of The Lancet Neurology

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