

Performance-enhancing Drugs and Issues of Health & Safety in the Workplace

Professor Brian Bloomfield and Dr Karen Dale
Lancaster University, UK

„Each single accident at work is too much“

State Labour Inspectorate Conference

Riga, October 12th, 2017

What are performance-enhancing drugs / cognitive enhancers?

Enhancement technologies - interventions “for the purpose of restoring an impaired function to previous or average levels, or to raise function to a level considered to be ‘beyond the norm’ for humans” (Academy of Medical Sciences, 2012: 7)

Include e.g. cochlear implants; prosthetics; robotics; genetic engineering etc.

Cognitive–enhancing (CE) drugs (also described as neuro-enhancers, neuro-technologies, psycho-pharmaceuticals or ‘smart drugs’) are pharmaceutical substances which are claimed to improve mental performance, such as alertness, attention or focus, concentration, memory or motivation.

Performance-enhancing (PE) drugs may be seen as a broader category including the use of drugs for improving social skills and motivation, such as dealing with anxiety associated with performing certain work.
e.g. use of beta-blockers for performance anxiety.

Issues in defining performance enhancing drugs

- **No** drugs are licensed by state medical authorities to be prescribed for the purpose of cognitive enhancement
- Usually involves the 'off-label' use of drugs prescribed for other specific medical conditions
- Cognitive ability is difficult to measure or compare and varies over time
- So what constitutes 'enhancement'?
- What is the difference between 'enhancement' and 'maintenance'; or between 'enhancement' and medical treatment?
- Despite such issues, there is increasing interest in cognitive enhancement - from individuals, the media , industry (huge market potential) and on the internet (e.g. online pharmacies)

The diversity of performance enhancing substances

- 1) Over-the-counter substances such as caffeine (coffee, caffeinated energy drinks and caffeine tablets) and other products sold for CE purposes
- 2) Misuse of drugs prescribed for medical disorders
- 3) Illicit drugs such as methamphetamine (crystal meth) or cocaine

The diversity of performance enhancing substances

- Internet sales have changed forms of consumption
- Classifications differ between countries
- There is a (minority) interest in ‘biohacking’- changing one’s own biology – and ‘stacks’ or combinations of these substances taken together to achieve enhancement

Current Main Performance Enhancing Drugs

Methylphenidate - a central nervous system stimulant used for treating Attention Deficit Hyperactivity Disorder (ADHD) and narcolepsy [EU trade names include Ritalin, Concerta, Equasym, Medikinet and Rubifen].

Modafinil/Armodafinil – another central nervous system stimulant, promotes wakefulness, used for narcolepsy. Licensed for *Shift Work Disorder* in the US but not in the EU because of potential serious side-effects [EU trade names include Provigil, Nuvigil, Vigil, Modalert, Modasomil and Modiodal].

Amphetamines – stimulants used to treat ADHD. Adderall (trade name) is a mixture of amphetamine salts. May be used off-label for the enhancement effects of increased focus (especially for study) or for euphoria ('high'), or for weight loss [EU trade names include Adderall and Tentin].

Prevalence of Current Use

- Difficult to ascertain precisely because of extent of non-prescribed use and internet sales
- Associated with certain groups:
 - **Military:** both authorised use and supervised research
 - **Students:** for enhanced study, focus, concentration, memory. Possibility of continuing into professional life.



Students used to take drugs to get high. Now they take them to get higher grades

The use of so-called 'smart drugs', bought on the internet, to boost mental performance is rife in British universities. So can we all benefit from 'having an edge', or is it just a form of cheating that should be banned?



Smart drugs: a stupid move for society? Photograph: Alamy

<http://www.theguardian.com/society/2015/feb/15/students-smart-drugs-higher-grades-adderall-modafinil>

Professor's little helper

The use of cognitive-enhancing drugs by both ill and healthy individuals raises ethical questions that should not be ignored, argue **Barbara Sahakian** and **Sharon Morein-Zamir**.

Under there are several drugs on the market that improve memory, concentration, planning and reduce impulsive behaviour and risky decision-making, and many more are being developed. Doctors already prescribe these drugs to treat cognitive disabilities and improve quality of life for patients with neuropsychiatric disorders and brain injury. The prescription use of each drug is being extended to other conditions, including shift workers. Meanwhile, off-label and non-prescription use by the general public is becoming increasingly commonplace.

Although the appeal of pharmaceutical cognitive enhancers — to help one study longer, work more effectively or better manage everyday stresses — is understandable, potential users, both healthy and diseased, must consider the pros and cons of their choices. To enable this, scientists, doctors and policy-makers should provide easy access to information about the advantages and dangers of using cognitive enhancing drugs and set out clear guidelines for their future use. To trigger broader discussions of these issues we offer the following questions, to which readers can respond in an online forum. None on to the questions.



Morning pick-me-up: will drugs that help you stay alert become as widely acceptable as coffee?

Nature, 20th December 2007, 450: 1157-1159

- **Long-distance transport:** aid concentration and wakefulness; long history of substance abuse in this industry due to commercial pressures & employment conditions
- **Shift workers:** including emergency/medical services, to aid wakefulness and coping with work/life balance. *Shift Work Disorder* is a diagnostic category.



<http://nuvigil.com/>

- **City traders and other high pressure occupations:** Widely reported in connection with drug abuse (e.g. cocaine, Adderall).
- However, may be an aid to necessary work/entertainment of clients, which is an unwritten expectation of their jobs.



THE  TIMES

Banking and Finance

News | Opinion | Business | Money | Sport | Life | Arts | Puzzles | Papers

Welcome to your preview of The Times

In the City that never sleeps... traders stay up on 'smart' drugs

<http://www.thetimes.co.uk/tto/business/industries/banking/article3928415.ece>

10 Reasons Wall Street Is Using Smart Drugs To Crush Work

<http://dealbreaker.com/2014/12/10-reasons-wall-street-is-using-smart-drugs-crush-work/>

Effects on Workers and on Work

- Contested - different studies show different effects.
“doubts about whether using these substances [CE drugs] enhances real-world cognitive performance in normal subjects” (Hall & Lucke (2010: 2012)).
- Long term effects and non-prescribed/unsupervised use are unknown.
- Potential for dependency.
- Not only cognitive, but also physical and emotional effects:
 - some studies show possibilities of over-confidence, abilities over-estimated
 - ➡ obvious implications for safety critical situations;

- informal accounts suggest that task focus may lead to corresponding dislike or avoidance of **social** interaction
 - ➡ potential negative impact on team working; again, may be crucial in safety-critical situations.
- Increased performance on some tasks may go along with decreased ability on others
 - e.g. methylphenidate may lead to an improvement on tasks that are unfamiliar but at the same time can produce a worse performance on familiar tasks
(Bagot & Kaniner, 2013).

Employment Issues of Performance Enhancing Drugs

- Potential coercion or indirect expectation to conform and take enhancers in some organisations/occupations.
- Likely to be associated with high pressure, competitive or bullying work cultures.
- Likely to be linked to shift working, or other ways of balancing demands of work along with life outside work.
- Senior professionals and managers may be as likely to take these drugs as those lower in the hierarchy.

- We can observe a change in emphasis: from drug taking as *problematic* for work, to considering how the use of these drugs might *improve performance and safety*.



[Courtesy of panoramio]



Study: Doctors Taking 'Smart Drugs' Perform Better Surgery
Published October 17, 2011 / NewsCore
<http://www.foxnews.com/health/2011/10/17/study-doctors-taking-smart-drugs-perform-better-surgery/>

“...modafinil (and chemically related compounds) may offer the most significant potential as an *efficacious* and *safe* chemical countermeasure to fatigue and could be of *assistance* to commercial drivers (even for chronic use) in the quest for *alertness management* in highway driving”

Krueger and Leaman (2011: 30, emphasis added) Washington D.C.: Transportation Research Board

Implications for Health and Safety at Work

- Need to consider safety issues and non-prescribed use.
- Typically very little knowledge about these sorts of drugs and their effects amongst managers/HR professionals or staff generally.
- Existing approaches tend to assume that drug use is:
 1. recreational or outside work
 2. linked to poor work performance, not undertaken to cope with or to enhance work (sometimes with explicit or tacit approval or acceptance by an organization).
- Thus policy and practice needs to take into account issues such as workplace culture; patterns of working hours; performance assessment and promotion criteria etc.
- Widespread or random workplace drug testing unlikely to be effective for these reasons.

Three Main Themes

1. The approach to the use of drugs at work has traditionally been that they are about addiction, a spill-over from recreational activity, and problematic to work and safety. The use of cognitive enhancers counters this with the idea that drugs might help improve performance at work or even improve safety.
N.B. The scientific evidence is contested, but nonetheless there is widespread discussion about it.
2. The consumption of cognitive enhancers is not about getting 'high' but about coping with or improving work performance, or coping with the boundaries and demands of work and non-work responsibilities.
3. Whereas managers have been seen as the enforcers of anti-drug use policy, managers and professionals are just as likely to use cognitive enhancers themselves; to turn a blind eye to or even encourage use in others because it might improve productivity.

Conclusions

- 1) This is an evolving area, suggesting dynamic changes in the future. At present there is a variety of substances which can be obtained and used for Cognitive Enhancement. Health and safety, and managerial responses need to take this diversity and the lack of medical guidance into account.
- 2) Future developments will depend on particular economic and employment circumstances, including:
 - The development of new & safer drugs
 - A change in attitude that sees enhancement as socially and medically acceptable
 - Workplace/economic cultures that are high-pressure, highly competitive and/or high-stress, with limited employee control.

Thank you for your attention

References:

Academy of Medical Sciences (2012) *Human Enhancement and the Future of Work* (London: Academy of Medical Sciences).

Bagot, K. S.; & Kaminer, Y. (2013) 'Efficacy of stimulants for cognitive enhancement in non-attention deficit hyperactivity disorder youth: a systematic review', *Addiction*, 109: 547-557.

Hall, W. D. & Lucke, J. C. (2010) 'The enhancement use of neuropharmaceuticals: more scepticism and caution needed', *Addiction*, 105(12): 2041-2043.

Krueger, G. P. and Leaman, H. M. (2011) *Effects of Psychoactive Chemicals on Commercial Driver Health and Performance: Stimulants, Hypnotics, Nutritional, and other Supplements*, Commercial Truck and Bus Safety Synthesis Program, Synthesis 19, (Washington D.C.: Transportation Research Board). Available at:

http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn_19.pdf