The Ethical Judgment: Chemical Psychotropics

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Abstract: In the case of psychotropic and nootropic substances, evidence is abundant that the pharmaceutical industries are violating elementary ethical norms, implying a serious liability not only for company managements, but also for researchers, laboratory staff, *etc.* Moreover, the rapidly expanding consumption of these substances seems to have radical repercussions on society and cultural norms. This paper points to three such further consequences: an abnormal spread of diagnostics in human interaction (Section 7.1); a potential suspension of the elementary fight for recognition (Section 7.2); and an ever-present demand for perfection in both working and private lives (Section 7.3). The question of responsibility for these developments is addressed.

Keywords: *neuroethics, chemical enhancement, culture of diagnoses, fight for recognition, coercive perfection.*

1. Introduction: The world-altering power of side effects

The following analysis applies a three-step model for ethical deliberation and ethical judgment that has not before been presented outside Denmark; therefore I take the liberty of shortly presenting a few basic preconditions for this model (Sections 1, 2, 3) before arriving (in Section 4) at the case proper.

Towards the end of his life, Danish philosopher K.E. Løgstrup (1905-81) makes a famous comment on the unintended side effects of the continuously accelerating technological development. Løgstrup talks of 'the world-altering power of side effects'.

Nowadays, when health authorities and the pharmaceutical industry consider 'side effects', focus is usually on phenomena of the kind also described on the long lists of reservations enclosed with pharmaceutical products: nausea, dizziness, heart fibrillations, 'should not be used during pregnancy' *etc.* – that is to say, medicinal, individually experienced, side effects.

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However, Løgstrup thinks along ethical lines, and he does so for two reasons. Firstly, the richest part of the World has left the era in which the purpose of technological progress is to overcome the scourges of poverty and thus can be justified by this raison-d'être alone: "As long as technology served to fight poverty – a battle that has been going on throughout the history of humankind – the purpose was so evidently just and sound that technology did not give rise to further ethical reflection. *This has since changed*." (Løgstrup 1983, pp. 18-19, my translation and emphasis.)

Secondly, globalization leads to a state where the mutual interconnectedness of humans – by Løgstrup termed 'the interdependency' – has strongly increased, in both close and more distant perspective. We are less than ever before isolated individuals in the sense projected in the pharmaceutical disclaimers mentioned above. On the contrary, we are unceasingly exposed to the consequences of what *other* people do.

Chemistry is both an active subject and a passive object in this development. Subject in the sense that chemical substances – both newly produced substances and chemical emissions and waste products – are to an eminent degree transboundary. Emissions rise up to the atmosphere, wastewater sifts down to the groundwater, *etc.* Only chemical substances, which are deliberately kept sealed in laboratories, may evade this agency. Chemistry is, on the other hand, also an object affected by this transboundary development in the sense that all chemical research and technological development nowadays should be carefully subjected to the strictest ethical protocols.

It is not difficult to explain why the strong side effects often come unnoticed by researchers. In order to be able to produce new knowledge, epistemic sciences like chemistry and physics must almost inevitably focus rather narrowly on a particular, strictly defined object, a cluster of objects, or the interaction of objects. Speaking in metaphors, the natural scientist has to watch the world through a magnifying glass, through a 'microscope'. This is true whether she studies the qualities of specific nanoparticles or the acceleration of the expansion of the universe. Nowadays all disciplines of natural sciences proceed methodologically only by isolating a meticulously selected corner of reality, thus leaving everything else out of sight. They are not able to encompass the wide-angle perspective.

From time to time, scientists and engineers are influenced by side effects while still experimenting. "Already while busy raising the agricultural production by means of insecticides, the unintended destruction of flora and fauna, imposed by the insecticides, sets in", Løgstrup writes (*ibid.*), perhaps with a thought towards DDT. In other cases, the unintended side effects only become apparent much later.

This insight teaches us a simple lesson, which is as important as it is simple: The declared purpose of any given technology should never serve as

grounds for the ethical judgment of it. Unfortunately, in institutions that have been officially authorized to make ethical reviews and recommendations one often finds that researchers' own descriptions of their intentions form the basis on which the body concerned estimates the ethical perspectives in the legalizing of some new technology or the performing of an important experiment. I have, however, never met a researcher whose intentions were not of the very noblest kind. Virtually all industries and industrial branches have only the best of intentions when carrying out research!

This is why I always seek to imprint in the minds of my students the classic proverb, usually ascribed to Samuel Johnson, but probably stemming from Bernhard of Clairvaux: 'The road to hell is paved with good intentions.' I advise them to focus instead on

1. the inherent personal risks (for users and others);
2. the risks of misuse (possibly malign misuse) and, not least;
3. the unintended side effects that are not immediately recognizable, but could prove decisive in culture and societies.[1]

2. Epistēmē versus phronēsis

Apart from Løgstrup's observations, my model for techno-anthropological ethics is inspired by Bent Flyvbjerg. In a seminal intervention in the protracted 'war' between the natural and the social sciences, Flyvbjerg demonstrates that the two branches build on fundamentally different intellectual virtues – and must do so. For hundreds of years this difference has been downplayed, and the reason is obvious: Since the industrial revolution, the natural sciences have gained tremendous prestige in society, because of their success in creating the base for ever new technological achievements, serving to increase the overall wealth and welfare in society. Conversely, the social sciences have been put in the shadows and have, as a result, made the mistake of trying to 'imitate' the methodology of the natural sciences, perhaps in the hope of sharing some of the prestige enjoyed by the latter. However, in doing so the social sciences have compromised themselves, precisely because they cannot hope to prove anything in the sense of the word used among natural scientists. As a matter of fact, this is not their purpose, either (Flyvbjerg 2001).

In applying the term 'prove', I refer to the first of Aristotle's famous five intellectual virtues[2]: *Epistēmē* denotes the ability to point out, through deduction or induction, what is unchangeable and universally true, which is the road to all natural scientific knowledge. The proof may well be concluded by the statement *quod erat demonstrandum.* He who understands epistemic thought is disposed, then, for deftness in the natural sciences. In applying

epistēmē, the scientist – or the team of scientists – arrives at universal, context-independent truths.

Technē, on the other hand, is the ability to create or shape artful products, artifacts. A clever shipbuilder applies this intellectual virtue when forming the keel of a ship so as to make it cut more effortlessly through the water. Likewise with the deft cither-maker; he builds the resonance chamber in shapes and with opening holes proper for reinforcement of the acoustic waves. The specialized experience of the artisan or craftsman plays an important role here. Through *technē*, he arrives at truths that are pragmatic, context-dependent and variable. Nowadays, the *technē* of the carpenter, the architect or the engineer is often referred to as instrumental rationality.

The third of Aristotle's virtues, the one to which Flyvbjerg primarily refers, is *phronēsis.* It denotes the ability to choose the acts that are required in a specific situation to ensure the good life – 'the common good' within the community (the family, the society, the state). In other words: An individual may be clever in calculating how a number of different chemical substances will react when mixed at certain temperatures (= *epistēmē*); or she may be clever in designing a thermostat with the ability to reduce heat loss in the rooms of a house (= *technē*); but she may also be clever in simply 'being a human' (= *phronēsis*).

Phronēsis is the most valuable of all the intellectual virtues, says Aristotle, because its presence – or absence – defines the ethos of society and the overall condition of the state. Accordingly, those who are chosen for political office, should possess a high degree of *phronēsis*. This virtue is sometimes translated as 'prudence' or 'good sense' and is also somewhat present in the contemporary concept of 'value-rationality'.

In the context of the present essay, we may ignore Aristotle's two final intellectual virtues (*nous* and *sophia*). What matters is the acknowledgement of how fundamentally different the epistemic and phronetic disciplines are to each other. The latter analyses values – what is good and what is bad in human life. *Phronēsis* is the reasoning that is directed towards practice, action. It examines relations that vary according to context – specific relations, not universal 'first principles'. Hence the result of a phronetic analysis is always temporary and might be changed when circumstances shift. In contrast, the natural scientist is bound to strive for a definite, once and for all solution to the problem at hand, a solution that makes a clear cut between true and false.

Reflecting on ethics is, to an eminent degree, a phronetic exercise, which is why the training of young researchers in making sound ethical estimates must take place during work on specific cases. Context – all that is particular – plays a vital role, and therefore decisions on what to do can rarely claim any definite necessity; circumstances may always change, leading to altered and maybe wholly dissimilar ethical judgments.

3. The ethical dilemma

All ethics are, of course, normative; the ethical deliberation refers to certain norms or to conflicts between different norms. Norms are commonly accepted moral truths about the nature of the good life, such as 'You must not kill', 'You must not steal' or 'You must not piss in the village well'.

Certain norms may primarily be characterized as prohibitions; this goes for ancient taboos such as 'You mustn't eat your fellow man', 'You mustn't commit incest', 'You mustn't treat the dead unseemingly' or the killing taboo. Other norms may be characterized, rather, as injunctions, such as 'You must help your fellow man who is suffering'. In the European cultural sphere, this norm is symbolized in the evangelical parable of the Good Samaritan – we refer to this norm as 'mercy', sometimes 'care' – which today has global validity, even though perhaps less so in *e.g.* Hindu cultures.

What ethical norms do have in common, whether prohibitions or injunctions, is the way in which they impose themselves on us as spontaneous incentives (Løgstrup 2007). We are spontaneously prompted to treat a deceased person seemingly (we wouldn't merely dump the body in a garbage container). We are spontaneously prompted to rescue a drowning person shouting for help, by jumping into the water. And, to include yet another norm, we spontaneously meet our fellow humans with trust, when, for example, we make an agreement or accept a promise. Society would not at all function if, instead, we were to meet with mistrust the man who tells us that we may find a supermarket further down the street or the woman who tells us that the bus drivers are on strike, so there's no need to wait for the bus today. Were we to assume, in short, that our fellow humans are probably out to cheat us, society would fall apart.

Other ethical norms of great significance today are justice, fairness, authenticity, autonomy, and the right to self-determination. Contemporary philosophers like, among others, John Rawls, Charles Taylor, and Michael Sandel have made significant contributions to the discussion on these norms. On the whole, however, such discussions within the community of academic philosophy have no direct impact on the training in ethical reflection among natural scientists; they are not at it to become academic philosophers. What matters is their ability to identify *ethical dilemmas* and to mobilize a certain *phronēsis* in the handling of them.

There are, indeed, examples of obviously 'evil' research and development where no ethical dilemmas present themselves. Within chemical science, one might point to the development of poisonous gasses and other chemical weapons, the purpose of which is to kill people in war. Such examples are rather uninteresting here, since participation in such research is uncondition-

ally condemnable, excusable with regard to neither homeland security nor orders from company management.

An ethical dilemma, on the contrary, expresses a normative conflict, the solving of which must rely on prudent estimates. Today, chemical research and industry present us with a long list of such difficult dilemmas. These are only a few examples:

- Should care institutions – nursing homes, hospitals, hospices, rehabilitation centers, *etc.* – ban employment of people who have received cosmetic treatment with Botox? The neurotoxin *Botulinum toxin* has since the 1950s been used for medical treatment of muscular spasms, but has also during recent years been used for cosmetic interventions, mainly facelifting. Now, recent research suggests that facelift treatments with Botox do not only weaken the affected person's ability to convey emotions through facial expressions, but also weaken their empathy for other people (Neal & Chartrand 2011). This corresponds well with other research showing that learning as well as empathy build on the human ability to mimetic mirroring of others; we 'feel', so to speak, the other person's grief or anger as though it were our own – we 'imitate' it. If further research confirm the findings of Neal and Chartrand, should it then lead to the health care sector taking this into account when employing staff, or maybe even to political regulations on chemical production of the toxin?
- As part of the struggle to prevent the climate of the Earth from collapsing, a range of geo-engineering projects are currently being developed. Some of them are about powdering cloud formations with a sulphurized powder, or about spraying salt water into the atmosphere (see among others Alterskjær *et al*. 2013). The aim is to 'whiten' the clouds, in hopes that the rays from the sun will be partly blocked from access to the lower parts of the atmosphere. The potential chemical side effects are not easily predictable. One possible side effect, which is being discussed, is the salting of soils through precipitation – agricultural land, woodland. Another possible side effect may be a decrease in precipitation, with an especially significant impact on regional monsoon seasons, this being due to decreased sunlight causing decreased evaporation (Ferraro *et. al*. 2013). Both effects, though seemingly opposite, might lead to crop failures and, perhaps, famine. The question, therefore, is: Who could claim the authority to decide whether to implement such a project, the result of which might have crucial impact on life conditions over the entire Earth? On the one hand, we feel a normative obligation to protect life-forms from the consequences of global warming. On the other hand, we hold on to the norm of self-determination, both to individuals and to nations.

Here, then, I have merely mentioned two very different and currently highly relevant examples of how chemical research and development today is inter-

twined with central techno-ethical dilemmas. Other examples might easily be found by the dozen. However, as the aim of the present essay is to demonstrate how ethical judgments are made, I will – for the remainder of the text – confine myself to one single case: The chemistry of psycho- and nootropics.

4. The substances and their spread: Denmark

To estimate the ethical challenges it can sometimes be useful to know about numbers. In 2015, a total of 156,982,000 DDD (daily doses) of anti-depressive drugs were sold in Denmark, making this group of products by far the most common psychotropic, even the most common pharmaceutical drug as such, in that country. The demographic backdrop to this figure is a total population of 5,627,235 people. Of these, 419,062 people – 7.4 percent – redeemed prescriptions for anti-depressive medicine during the year mentioned. In 2011, figures were even higher (8.29 percent of the Danish population). But in 1996, figures were significantly lower, as 'only' 106,476 Danes – 2.0 percent of the population – consumed anti-depressants. When converted into statistics the amount of sold drugs within this category rose, over a period of 15 years (1996-2011) with 333 percent! This increase is quite evenly distributed across the years.[3]

The largest group is, by far, the SSRIs (selective serotonin reuptake inhibitors).[4] Add to this the anxiolytic benzodiazepine and benzodiazepine-like drugs, which were sold to 550,117 Danes in 1999, but to 'only' 336,514 fifteen years later (2014). A range of lithium-based products were sold in 3,154,400 DDD in 2014 (statistics on the number of people buying these products are not available).

An even more dramatic development may be observed when looking at methylphenidate-products, which are prescribed for the treatment of ADHD. In this case, the number of users has risen from 1,812 in 1999 to 41,612 in 2015 – a total increase in the number of users, within 16 years, of 2,196 percent!

Common to all the drugs mentioned above is the purpose of regulating feelings, moods, memory, the ability to concentrate, *etc.* by influencing the neurotransmissions of the brain. But, contrary to psychedelic drugs on the black market (such as LSD, ecstasy, or cocaine) and 'natural drugs' taken in shamanistic contexts (mescaline, among others), these products are produced and ordained by pharmaceutical companies. SSRI products are ordained for the treatment of depression, anxiety, obsessive compulsive disorder (OCD), shyness, stress, and sometimes posttraumatic stress disorder (PTSD). The slightly different SNRIs (serotonin-norepinephrine reuptake inhibitors) are

ordained for the treatment of just about the same disorders. Ritalines may be ordained to children and youths with hyper-kinetic disorders (ADHD) and otherwise only for the treatment of the relatively rare disorder of narcolepsy.

It seems relevant to ask what has caused this enormous increase in the consumption of Central Nervous System stimulants?[5] Has bio-chemical research and the pharmaceutical industry succeeded in developing new substances with the ability of fighting widespread diseases, which were before left untreated? Or, are we witnessing epidemic outbreaks of completely new disorders? Is it mostly about the medico-chemical industry's commercial interest in making up new markets and producing new consumers of future products? Or are we seeing such fundamental changes to our social life conditions in modern societies as to make necessary new forms of mental regulation? I will try to answer these questions as part of my ethical judgment.

5. Step one: Inherent personal risks to the user

The essential property of the group of chemical substances dealt with in the present essay is that they influence the functions of the brain, altering mood and consciousness. In this they are similar to recreative drugs, some of them almost identical by their chemical composition – *e.g.* methylphenidate is very close to amphetamine (which is used, by the way, in the North American parallels to ritalins: Adderall, Dyanavel, and others).

Since the human brain, by far the most complex organ in nature, has not yet been satisfactorily mapped by science, it would seem obvious that systematic intervention in its neurochemical processes must inevitably imply a certain, smaller or bigger, risk. We do something to the brain – we observe an effect, but we do not know precisely what we are doing. The different substances affect the serotonin, the dopamine, or/and the noradrenaline receptors respectively, thereby amplifying the levels of these transmitters in the brain – but the substances work very differently, depending on their exact composition, the way and the amount by which they are induced, and the receiving human bodies. The whole thing is still confusingly complex and incomprehensible.[6]

In this situation, the application of the precautionary principle is obviously relevant. On European scale, the precautionary principle is detailed in Article 191 of the Treaty on the Functioning of the European Union. But it is also emerging as a factor of growing importance in global bodies like the UN World Commission on the Ethics of Scientific Knowledge and Technology (COMEST 2005) and the World Health Organization (WHO 2016, Martuzzi & Tickner 2004).

However, in this case precaution has mostly been bypassed, and based on the above mentioned, rather incalculable complexity, it was foreseeable that a number of unwanted side effects would occur – also, that some of these would be subject to fierce debate. (1) First, the use of all psychoactive drugs entail a propensity for creating addictions. Already in 2003, an expert WHO committee determined that a substantial number of SSRI-users show signs of abstinences upon ceasing to use the drugs. WHO in fact complains that pharmaceutical companies and the psychiatric establishment seek to create terminological confusion by distinguishing between 'addiction' and 'withdrawal syndrome' (WHO 2003). Other frequent side effects are (2) dizziness (potentially fatal to older people) and (3) sexual disorders such as decreased libido. Providing a systematic overview of known side effects of psychotropic and nootropic medicine is not the aim of the present essay, but I wish to present a selected example: Paroxetine.

In September 2015, *British Medical Journal* (BMJ) published research that seriously incriminates the pharmaceutical giant GlaxoSmithKline (GSK) in particular, and the pharmaceutical industry in general (Le Noury *et al*. 2015). The investigation is the first of a planned series of revisions of earlier pharmaceutical product tests, with new researchers looking over the originally collected data and the published conclusions. In this case, focus is on the anti-depressive drug Paroxetine, which following a 2001 test was claimed by GSK to be safe for both adults and children. Paroxetine is also being sold in Denmark under the name of Seroxat, and 6.0-6.7 million DDD are being prescribed annually.[7] The new revision concludes that the beneficial effects of Paroxetine on children and adolescents are smaller and the harmful (side) effects far more serious than claimed by GSK in 2001. One of the seven authors, Professor David Healy of Bangor University, was quoted in the British newspaper *The Guardian* for saying that around 12 out of 93 children risk suicidal thoughts when using the drug, a figure that is clearly discernable from the original data! "This is a very high rate of kids going on to become suicidal. It doesn't take expertise to find this. It takes extraordinary expertise to avoid finding it." (Boseley 2015)

In an editorial comment BMJ claims it to be a blemish on medical research that the 2001 report has not been withdrawn and that none of the 22 researchers behind it have wished to modify any of their previous statements (Doshi 2015). The report has long been criticized. Already in 2002, the US Food and Drug Administration claimed that documentation of the alleged beneficial effects of Paroxetine was non-existent and in 2012 GSK were sentenced to a penalty of 3 billion dollars for misguiding and exaggerated marketing of the product.

Here, then, we have an example of unethical circumvention of the precautionary principle. Both the authorities and the public have deliberately been

misled in order for GSK to obtain a permit that the products in question would otherwise not have been able to achieve. When reactions have not been stronger – in spite of suicides among adolescents, which might have been prevented – it is no doubt down to the enormous power held by the pharmaceutical industry over research institutions as well as political circles.

In a comment on the publication of the sensational article, the editor in chief of BMJ, Fiona Godlee, remarks that this first revision report clearly demonstrates the degree to which the current regulation of pharmaceutical products has failed. It is absolutely necessary, she claims, to establish independent clinical testing instead of tests that are financed and carried out by the industry itself, the latter practice being unfortunately commonplace today.

In Denmark, patients may seek information on Paroxetine products on the website www.min.medicin.dk, a sort of user's guide run and financed by the pharmaceutical industry itself. On Seroxat, this 'user's guide' states that it may be used for the treatment of depression, anxiety, OCD, social phobia, *etc.* The side effects are listed in four categories: 'common', 'not so common', 'rare' and 'extremely rare'. In none of these categories, the risk of suicidal thoughts is mentioned; it is stressed, on the other hand, that most side effects appear only in the early phases of the treatment!

In his very critical book on the subject, *Deadly Psychiatry and Organised Denial*, the leader of the Nordic Cochrane Center, Peter C. Gøtzsche, lists numerous examples of devastating side effects of psychotropic products that are today being generously prescribed by psychiatrists as well as general practitioners (Gøtzsche 2015). Gøtzsche is a professor of clinical research design and the entire book is strictly based on demand for severe evidence. The focus point of the book is that test results are too often interpreted at pleasure by the pharmaceutical industry and – especially worrying – that inconvenient test results are kept quiet.

6. Step two: Potentials for misuse

In my model for ethical judgment this step normally refers to finding out whether other persons or other interests might have access or capacity to apply a given technology in ways not originally anticipated by the researchers. SCiO for example, is "a pocket size molecular sensor for everybody".[8] The device, produced by Consumer Physics Inc., is a handheld scanner that uses spectroscopy to analyze the chemical composition of anything it's pointed at. When the company startup was launched on Kickstarter in 2014, the purpose was presented as "identifying foods for diet tracking and check-

ing medications to make sure they're not counterfeit" (Strictland 2016). On this prospect the startup managed to allocate $ 2.7 millions from "enthusiastic backers". Now, investigating the use of the device after it has been brought to the market, Eliza Strictland of the Institute of Electrical and Electronics Engineers found that the two top threads in the "developer forum" on Consumer Physics's website were proposing apps to test the purity of illegal drugs, starting with ecstasy. Ecstasy, she explains, "is often cut with other substances, ranging from inert fillers to dangerous chemicals, but since most labs won't test illegal drugs, users have no way of checking what they're taking. This situation sounds like a problem that the SCiO can solve […] although it might not be what Consumer Physics wants to be known for" (*ibid*.).

The case of Paroxetine, though, is unusual because it is the actions of the pharmaceutical company itself that qualify to the category of 'misuse'. Putting other people's health and life at risk for the sake of company growth and profits is evidently morally reprehensible.

However, it seems to be a common notion that responsibility in such cases lies with the managers of the company, whereas individual employees have merely carried out work that they were ordered to do. This perspective is convenient but untenable. It denies the existence of certain codes of professional ethics – a factor that perhaps especially ought to demand the attention of everybody whose work is related to the treatment of diseases.

This can clearly be derived from the history of the Third Reich. Not only was the chemical industry a crucial factor in the economy of the Third Reich (BASF, IG Farben, *etc.*), but many of the Nazi crimes against humanity were committed by the medical professions – doctors, clinical assistants, laboratory staff, *etc.* Atrocities ranged from euthanasia-programs for handicapped children, via cooling down prisoners of war (testing what humans can endure), to the infamous genetic experiments of Joseph Mengele.

The legal process against these war crimes forms the historical backdrop to the Helsinki Declaration where the World Medical Association (WMA) recognizes a set of ethical principles for all research and all experiments on human beings, including research that is combined with medical treatment and care.[9] The meaning is unmistakable. The verdict in 1947 of the court in Nürnberg upon the Third Reich doctors also applies to present-day Denmark and other modern states. No one who partakes in forms of medical treatment or development of medicaments that violate the ethical principles of human dignity or informed consent, can possibly evade co-responsibility for their actions by claiming that they were merely following orders and performing the duties of their work, ignorant of the final purpose of their contributions. Even at the cost of losing one's job, one is in such circumstances obliged to 'blow the whistle' and demand a change. This is simply the very essence of

what's termed 'professional ethics', also including all staff at Glaxo-SmithKline.

Another group of psychotropic preparations charged with misuse are the ADHD products: Ritalin, Adderall, *etc.* Elsewhere, I have documented how students at US colleges feel pressured towards consuming what is commonly referred to as 'brain enhancers' or 'brain doping', simply because their fellow students do it and because it seems an accepted 'fact' among students that the consumption of such amphetamine or methylphenidate drugs enhances the ability to cope successfully with written assignments, tests, and examinations (Birkholm 2015, pp. 145-150). Already in 2008, a joint group of doctors and philosophers suggested that these prescription substances become regular over-the-counter drugs, so that students in the USA and Europe may freely buy them without running the risk of incrimination (Greely *et al*. 2008). Instead of seeing these students as drug abusers, we should – according to the authors – consider them "early adopters of a trend that is likely to grow", in other words, a kind of pioneers.

"Human ingenuity", they write, "has given us means of enhancing our brains through inventions such as written language, printing and the Internet". And: "The drugs just reviewed, along with newer technologies such as brain stimulation and prosthetic brain chips, should be viewed in the same general category as education, good health habits, and information technology – ways that our uniquely innovative species tries to improve itself." (*Ibid*.)

I fully agree with the authors that enhancement of our species is the real issue at stake here, but I do not acknowledge their assumption that engineering interventions in the human brain and nervous system belong to the same categories as former inventions like printing, libraries, or coffee. Adding all the present enhancement endeavors within different scientific fields (genetics, robotics, brain-computer interfaces, pharmacy *etc.*), the whole thing sums up to a both dangerous and preposterous attempt to intervene in the evolutionary process that was for millions of years driven by hazards, natural selection, and other very wise principles as demonstrated by Charles Darwin.

Since the potential for enhancing humans is tantalizing to these doctors and philosophers,[10] they do not consider excessive consumption of these drugs a kind of misuse. Hence they do not at all touch upon the question of the identity of future well-educated people: Do we want future 'academics' to be persons who perform specific, highly specialized analyses only by the aid of cognition-enhancing drugs? Or do we, rather, prefer 'academics' to go on being persons who by the aid of their naturally and socially endowed cognitive and analytic abilities are capable of acquiring substantial knowledge and complex skills within certain subject areas?

These questions of authenticity are examples pointing to the real ethical issues (some of which I discuss in Section 7). To most of the authors joining

the discussion on cognitive enhancement, the ethical task seems to be an estimate of the possible risks for the individual users – a set of problems I would term *ante ethics*: The real ethical deliberations can only begin by assuming this or that new technology to be safe for use.

Greely *et al*. made their contribution in December 2008. A more recent debate, grossly along the same lines, was initiated in July 2013 in the *American Journal for Bioethics*. Here, Serbian philosopher Veljko Dublević – linking up with Greely *et al*. – asks what would more specifically be a "responsible use" of Ritalin and Adderall for enhancement purposes. Dublević (2013) expresses his intention to clarify this by answering the following question: "what exactly should be the moderately liberal public policy" for regulating such drugs? His answers are commented among others by Hall *et al.* (2013), Faulmüller *et al*. (2013) and LaBuzetta (2013).

This is a policy issue, clearly besides the focus of the present article.[11] On these pages I am dealing with the industry behind the drugs, not with questions of prohibition or regulations on the market. What are the responsibilities and the ethical challenges facing the chemistry researchers and the producers behind the drugs? That is the question here.

Some interesting points, however, are worth noting from the advocates for cognitive enhancement. Their main concern is to decriminalize the growing number of young people using the drugs, referring explicitly to the ethical principle of autonomy. If, say, person NN is perfectly able to use Adderall in a controlled way, capable of monitoring his own reactions carefully and preventing a slip into addiction, then a prohibition would be a paternalistic violation of his autonomy.

This a somewhat reduced understanding of autonomy, very far from the original concept as formed by Immanuel Kant in the wake of European Enlightenment. If respecting the norm of autonomy sums up to respecting personal preferences, there is really nothing left for ethical reflection. As observed by Wayne Hall *et al*. (2013) this whole philosophical literature is dominated by libertarian views – views that are generally not shared by drug policy analysts.

In Denmark, the National Board of Health (SST) dictates that Ritalin products may be prescribed to children and adolescents between the ages of 6 and 18, who have been diagnosed with ADHD. Nonetheless, half of all prescriptions are currently being handed out to adults, thus failing to meet the prescribed indication area (Danish Council on Ethics 2010, p. 71). Also, the Council found that children and adolescents are in many cases pressured into an ADHD diagnosis, which in Denmark may release funding for extra staff resources in school and offer relief to tormented parents who often receive complaints about their unruly children.

7. Step three: The effects on culture and society

To investigate eventual users' risks inherent in a new (or old) technology is really to inspect whether any malfunctions were neglected by the inventor (Section 5). Then, to investigate the potentials for misuse is to turn one's view from the microscope-lens of the laboratory to the world outside: Did we overlook some other possible applications of this invention, more or less unpleasant and not intended by the scientists? (Section 6)

But the real challenge when making a prudent ethical judgment is the third step: To address the future, attempting to assess whether this scientific invention, provided it proves effective in the way we want, might have any ethically significant effects on society and culture.

Since most of the drugs we are discussing in this essay have been accessible for decades, it is easier than usual to give answers on all steps in this model of ethical judgment. Concerning the last step, I will now deal briefly with three questionable phenomena: (1) the expansion of a culture of diagnoses as a consequence of the ample supply of psychotropics; (2) a suspension of the essential human fight for recognition as a possible threat to society's checks and balances; (3) the implacable demand for perfection in both working and private lives.

7.1 Life diagnosed

The transition during the last 25 years in the conception of mental frailties from seeing them as something caused by important life experiences to regarding them, rather, as biologically determined, has been fairly well described (see *e.g.* Lane 2007, Mayes & Horwitz 2005). The subtitle of Lane's book, *How Normal Behavior Became a Sickness*, is characteristic. The crucial paradigm shift took place with the release of DSM-3, the third version of the diagnostic manual of the American Association of Psychiatrists, published in 1980 and completely overturning our former notions on the nature of mental illnesses. Though the DSM manual is prepared by a US professional consortium it has international impact. Not least because it underlies the WHO classification manual ICD-10, which is used in most countries of the world.

Until 1980, a certain friction existed between, on the one hand, the medically trained psychiatrists, used to coping with mental problems by means of pharmaceutical products and, on the other hand, analytically trained psychologists who viewed mental illnesses in a broader context. The latter group was on the advance during the 1970s, and this caused disturbance in the USA where more precise definitions were in demand. At the same time, US insurance companies began covering the expenses of psychotherapy via health insurance schemes, but only in case of 'real' diseases or illnesses – in cases of 'reactions to existential problems' no insurance coverage was offered.

From 1980 onwards procedures were changed, so that when a therapist could mark out a certain number of symptoms from a list this would constitute a diagnosis, on the basis of which treatment – always a medical treatment – might be initiated. Which 265 diagnoses were included in the 1980 catalogue was decided by show of hands at the professional consortium behind the register.

A diagnosis denotes that something is out of course, deviating. But how and when can something be defined as 'deviating'? If you are tagged with a certain diagnosis, you belong to a certain group of people who are different in a very specific way. Such people are, then, the same, and they will often unite in their sameness – this is called 'a patients' association'. But in reality we are all both 'the same' and 'different'. Some people just attach more importance to the differences than do others.

Were we to ask what society stresses most – the similarities or the differences – the answer would be that this changes with time. A hundred years ago, at the time of Sigmund Freud, all women who did not feel at ease in the bourgeois patriarchal family were considered neurotic. Like Madame Bovary, Flaubert's famous fictional character. Today, not a single neurotic person is to be found, simply because this diagnosis has been deleted, struck off the register. Instead, we now have the television series *Desperate Housewives*.

In 2013, the diagnosis register was published in a new version, DSM-5 (the previous, DSM-4, was released in 1994). The debate prior to the publication of the new manual made it clear that the distinction between the sick and the healthy mind is something that is actually determined through negotiations. There were votes, horse trading, and a multitude of economic interests involved. When, for example, shyness may now be diagnosed as *Social Anxiety Disorder (SAD)* and when the intense grief over the death of a closely related human qualifies to the diagnosis of *Major Depressive Disorder (MDD)* – that is, if this state of grief lasts for more than two weeks – this reflects the social norms as well as the economic interests of a certain group of professionals in a certain culture at a certain historical point in time. *Disruptive Mood Dysregulation Disorder* (DMDD) is a diagnosis for children who burst into heavy outbreaks of temper at least three times a week. Yuck! And gluttony is now diagnosed as *Binge Eating Disorder (BED)*. On the other hand, Asperger's Syndrome no longer exists.

Diagnoses come and go, and the diagnoses we make tell us much about the dominant norms of our time and society. They also tell us much about the development of the pharmaceutical industry, though. Diagnoses, as it is, tend to appear in the wake of the development and approval of new medical products. The above-mentioned Paxil, Seroxat, and Nardil products are recommended, for example, to people suffering from shyness; the former two are variants of Paroxetine (described in Section 6).

Parallel with the increased medicalization, large groups within western populations seem to have become participants in an intense hunt for diagnoses. In many countries, diagnoses have also become the admission ticket to treatments, economic benefits, support services, *etc.* The other side to this, though, is the intensified standardization of human beings. Individual life stories are suspended, thus cutting off sources to the selves. The ethical demand for authenticity is jeopardized.

If, say, a young man is hyper-attentive, having been raised in a family dominated by a violent father, in a home where family members must constantly be vigilant in order to anticipate the father's sudden mood swings, this part of the young man's identity is erased when he is diagnosed and medicated. When an older woman is sad because her husband left her ten years ago for a younger, perhaps more attractive woman, this important life story is easily eliminated when she is merely given a diagnosis and offered antidepressants.

In such a medicalized culture, diagnoses make sure that individuality is left in the dark – and along disappears the individual's struggle for freedom and autonomy.

7.2 The Fukuyama-Kojève argument

Advocates of human enhancement generally show more interest in the ethical dimensions of cognitive enhancers although mood enhancement poses larger challenges. In my book, *Efter Mennesket (After Humans)*, I have adapted the argument brought forward by Francis Fukuyama in 2002, that psychotropic medicines represent a potentially dangerous intervention in some of the most fundamental, socially balancing mechanisms inherent in all kinds of societies: the mechanisms linked to the fight for recognition (Birkholm 2015).

Inspired by Plato (427-347 B.C.), Hegel (1770-1831) and Kojève (1902-1968), Fukuyama identifies *thymos* as the true origin of man's commitment to both work and politics. *Thymos* is the part of man, which has to do with neither rational thought nor basic instinct, but with emotions such as honor, shame, justice, ambition, self-esteem, and self-respect, emotions that we wish to see recognized by our fellow men.

"*What, must I hold a candle to my shames?*", Shylock's daughter Jessica cries out in the second act of Shakespeare's *The Merchant of Venice*, when young Lorenzo in the darkness of night abducts her by a ladder and at that point presents her with a flaming torch (Shakespeare 1967, pp. 55f.). By running away, Jessica abandons her Jewish father, even taking with her a small chest containing part of his treasures. It is shameful, and Jessica wants her suitor and his helpers to recognize this feeling.

This same Shakespeare demonstrates, with the tragedy of Richard III, how a born cripple claws his way towards the English throne by cheating and murdering, in hopes that political power will satisfy the longing for recognition that neither beauty nor physical abilities have ever granted him.

Some might argue that these Shakespearean examples are far away from the ethical challenges of chemistry. Quite the contrary. They are both vivid illustrations of some of the fundamental human feelings that pharma-chemical research and industry now tries to modify or eliminate.

The thymotic urge towards recognition is, according to Fukuyama, a vital fuel for all human development and civilization:

> Virtually all human progress has been the by-product of the fact that people were never satisfied with the recognition they received; it was through struggle and work alone that people could achieve it. Status in other words, had to be earned, whether by kings and princes, or by your cousin Mel, seeking to rise to the rank of shop foreman. The normal, and morally acceptable, way of overcoming low self-esteem was to struggle with oneself and with others, to work hard, to endure sometimes painful sacrifices, and finally to rise and be seen as having done so." [Fukuyama 2003, p. 46]

As we know today, the achievement of being recognized also comes with a chemical side: A reward inside the individual's brain in shape of high levels of serotonin. Winners of the Olympic gold medal or winners of a prestigious song contest may experience a 'shower' of serotonin in their brains. So – this is the argument of Fukuyama – would Thomas Jefferson ever have achieved to write the American Declaration of Independence, would Winston Churchill for all his speech impediment ever have endeavored to lead Great Britain in World War II, would Thomas Mann ever have written some of the greatest novels of our time, would Bob Dylan ever have written all his ballads, and would Jon Stewart ever have managed to host 16 years of *The Daily News* if all of them had free access to Prozac or Zoloft? These anti-depressants are sold in the USA with the advertised idea that the pills can provide self-esteem (in biochemical language: they delay the reuptake of serotonin in your brain).

The question, then, is not only whether anti-depressants (as discussed in Section 5) may harm the individual consumer. The question is, rather, whether the aggressive marketing of them may, in the long perspective, disturb some of the most delicate checks-and-balances in the fabric of society.

7.3 The Quest for perfection

I see a common denominator between: the dissemination of mood enhancers; the explosive use of 'brain doping'; the promotion of advanced technologies for prenatal diagnosis; the aspirations to do gene-editing in human embryos; the strive to delay human aging at cellular level; experiments with augmented

vision; and lots of other emerging biotechnologies – both genetic, pharmaceutical, and cybernetic. And that common denominator is the pursuit of Human Enhancement.

The *Zeitgeist* gives us the impression that humans are not good enough as they are. We have too many shortcomings and imperfections, hence we must take advantage of the ongoing technological revolution to reshape humankind: make us more fit, more intelligent, able to live much longer, equipped with superhuman abilities. This idea has become almost a religious obsession to 'posthumanists' and 'transhumanists' like Nick Bostrom, Julian Savulescu, John Harris, Kevin Warwick, and many others. They are now in the limelight of academic conferences on ethics (or 'applied ethics'), always able to vindicate some new technological progress and explain away all ethical concerns.

And you do not want to be considered a reactionary, do you? A reactionary in the field of science and technology today seems to be a person who does not unconditionally support the next 'inevitable' step in human evolution: A merging of man and intelligent machines to create a whole new species, a kind of *homo technitos* or, as I prefer to frame it: *homo artefact*. After all, this is the golden gate that most of the advanced technologies envision: A leap into the making of some kind of cyborg-creature, which can travel in space, communicate directly with machines and other forms of intelligence, and which are not dilapidated like us.

Most of these ideas still have the character of science fiction, of course. The creation of a memory expansion slot to insert in human brains still has a long way to go. Intelligent prostheses with more advanced abilities than natural arms and legs can be made today, but we are far from ready to apply them on a mass scale. Recent progress in gene-editing techniques (CRISPr) may be encouraging to the posthumanist dream, but also in genetics we are still miles away. Only one branch of science is really able to deliver for the moment: The chemistry of psychotropics and nootropics. So, this science today maintains and nurtures the dream of human perfection.

One could ask: Is it only the new and emerging technologies, including those of pharmacy, that produce the quest for perfection? Or is it – the other way round – our present obsession with competitiveness that produces a demand for such technologies? That may be a question of the-hen-and-the-egg, and a fair answer might be that the technological innovation in its present directions and the culture of neoliberal economy mutually nourish each other.

It is, in fact, not difficult to find cultural explanations of the appetency for perfection. The competition of admission to both academic and non-academic educations is becoming increasingly tough, and the same applies to job admissions. People are obliged nowadays to perform 24/7 – performing, that is, on a strangely impalpable scale, where the job is not to build a brick

wall, to mount a valve, or to make drawings for a new building, but to reach certain abstract targets, evaluation criteria, quotas, *etc.* Moreover, while performing excellent you have to look like a complete success: fluent, painless, fulfilling without effort, easily spending, and very happy.

A Danish Professor in the History of Ideas, Lars-Henrik Schmidt, recently studied Job Advertisements and found the overall most demanded competency (sic) to be: 'cheerful', in 'a light mood', 'generally gladsome', *etc.* (Brinkmann 2010, p. 133).Today this is taken as an indication that you are cooperative . Furthermore, add Schmidt and his co-author Claus Holm, the opposite mood is now pathologized. To be sad, melancholic, disconsolate, or apathetic is considered abnormal (*ibid*.). So, if you are a highly skilled chemistry laboratory technician with a penchant for philosophy and melancholy, you do not need to apply – you will not get the job anyway! The employer prefers a less skilled rival who is always happy.

This demand for both effortless performance and an ever-happy face bear witness to a cultural schizophrenia with a lot of implications, one of the most well-documented being stress and depression. Certainly, this state of mind creates a lot of jobs in the businesses of coaching, wellness, fitness, and therapy, but it also nourishes the underlying utopian idea of perfection. Today, Lara Croft, 007, Batman, and Superman are no longer just mythological figures of fantasy, they are real role models. They are no longer presented to us merely for our amusement in the cinema, we have to live up to them.

In this perspective, all sorts of optimizing technologies seem to offer a great relief, not least the chemical ones abundant today. But they also make an important contribution to maintaining a quest, partly of their own creation, that threatens to alienate humans from their authentic selves.

8. Conclusion

The chemical sciences are right at the core of the complex ethical dilemmas in present-day techno-anthropology. Virtually no corner of our society is independent from the findings and the innovations within chemistry, even our supply of energy depends on it. And virtually no spot on the earth, be it land, water, or air, can evade the consequences of chemical production. It is therefore essential that universities and technical high schools educating chemists include mandatory training in making ethical judgments. This can be done by applying the three-step model described in this essay: (1) focus at the inherent personal risks (for users and others); (2) then investigate the risks of misuse (possibly malign misuse); and, not least, (3) finally discuss unintended side effects that could prove decisive in culture and societies.

In the case of psychotropic drugs, chosen here as an example, ethical considerations are shown to be long overdue. Not only is a rampant excess consumption – co-produced by pharmaceutical companies, psychiatrists, and general practitioners – constituting a systematic and truly unethical misuse of these chemical technologies. Management and employees are putting millions of people's health at risk, and thereby fail to honor the ethical responsibilities of their respective professions.

At the same time, though, the production and distribution of these substances are fueling certain deep tendencies in contemporary societies, which at best we ought to analyze and make choices about, at worst they are just 'happening' to a generation of helpless humans: (1) the tendency to circumscribe all individuals within certain digital standards that constitute a diagnosis, but at the same time threaten to eliminate any individuality and freedom to define your own path in life; (2) the danger of substituting the joy of reward for doing something excellent with a chemical surrogate, thus halting a decisive mover of the dynamics of history; (3) the demand for flawless performance, leaving all sorts of imperfection and impairment in society's dustbin.

Perspective: All three tendencies could motivate for a moratorium on further development of the substances concerned, if needed for a couple of years, thus making way for a necessary ethical deliberation in science and society.

Notes

[1] Birkholm 2014. I define techno-anthropology with Tom Børsen as studying the interface by which technology changes humans as well as humans changes technology.

[2] Aristotle 1982: Book VI, pp. 324-373.

[3] All figures have been obtained from the official Danish Registry of Medical Statistics (www.medstat.dk) which is administered by the Danish Health Data Authority. The reason that the increase was brought to a halt in 2011 may be that a report from the Danish Council of Ethics was published in November 2010, initiating a prolonged debate in the Danish media. That, however, is only a hypothesis.

[4] Among the SSRI products, figures were: 96,492,000 DDD in 2014, 112,307,000 DDD in 2011, 27,013,000 DDD in 1996. Marketing names in Denmark are, among others, Citalopram, Escitalopram, Fluoxetin, and Paroxetin.

[5] A similar development is discernable in a range of countries; see Whitaker 2015, pp. 363f.

[6] The number of neurotransmitters has – until now – been estimated to be more than one hundred, but more will most likely be discovered. Mentioned in this pa-

per are only: Serotonin ($C_{10}H_{12}N_2O$), Norepinephrine ($C_8H_{11}NO_3$), and Dopamine ($C_8H_{11}NO_2$).

[7] Estimated by the author on the basis of data for 2011, 2012 and 2013 from the Danish Registry of Medical Statistics. If sales figures within the private sector (pharmacies) are added to the handing out of prescriptions at hospitals, the numbers for 2011 are 6.735 million DDD; for 2012 6.403 million DDD; and for 2013 5.977 million DDD.

[8] See https://www.consumerphysics.com.

[9] The declaration was adopted in 1964 and has since been updated several times. In Denmark, it has not least been influential in connection with the formation in 1980 of the Danish Committee System of Research Ethics and later (in a more indirect manner) in relation to the founding of the Danish Council on Ethics.

[10] One of the authors, John Harris, is – indeed – professor of bioethics (University of Manchester).

[11] I have, however, dealt with it elsewhere (Det Etiske Råd 2010).

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