

## TA-PROJEKTE

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## Ethics in Policy-Making: The Case of Human Enhancement

by Christopher Coenen and Arianna Ferrari, ITAS

The overarching goal of “Ethics in Public Policy-Making: The Case of Human Enhancement” (EPOCH) was to broaden and deepen knowledge of the role of ethics in the governance of new and emerging science and technology (NEST), taking the topic of “human enhancement” as the main case example. Comparative analyses of relevant institutions and current governance and normative frameworks at European and national level (including non-EU countries and taking into account selected non-European countries) have been conducted, and detailed studies on the topic of human enhancement and its governance have been carried out. Launched in November 2010, the recently completed project EPOCH was funded by the European Commission in the Seventh Framework Programme and coordinated by the University of Bristol. Other partners were the Institute for Technology Assessment and Systems Analysis (ITAS) within Karlsruhe Institute of Technology (KIT), the universities of Padua, Aarhus, Ljubljana, Maastricht, Swansea, Singapore and Calgary, and the French Centre National de la Recherche Scientifique. In the following, the main results of EPOCH work packages led by ITAS will be presented, above all concerning the topic of human enhancement.

### 1 Introduction

ITAS was one of the main partners in EPOCH, which aimed to broaden and deepen knowledge of the role of ethics in the governance of ethically controversial NEST. The project focused on new and emerging bio- and neuro-technologies and on the topic of human enhancement, including doping in sports. Area 2 of the project, which was led by ITAS, dealt with the topic of human enhancement and the related challenges for European policy making. Besides various empirical and theoretical studies, an expert workshop on the governance and ethics of human enhancement was organised in Karlsruhe in March 2012.

## 2 The State of the Art in Technoscientific Fields Potentially Relevant to Human Enhancement

How did EPOCH define “human enhancement”? Building on older projects such as a STOA study on the topic (Coenen et al. 2009), it was understood as any “modification aimed at improving individual human performance and brought about by science-based or technology-based interventions in the human body”. A distinction was made between (i) restorative or preventive, non-enhancing interventions, (ii) therapeutic enhancements, and (iii) non-therapeutic enhancements, focusing in our analysis on non-therapeutic enhancements since they are at the core of discourse on human enhancement. Human enhancement was primarily regarded as a specific perspective on developments in science, technology, medicine and society, and “human enhancement technologies” (HET) therefore less as a field of technologies and more as a number of technologies subsumed to a certain, ideologically framed goal. This definition includes “strong” forms of human enhancement with long-term effective or permanent results (e.g. genetic enhancements and invasive brain-computer interfaces) as well as “temporary” enhancements (e.g. alleged “pharmacological cognitive enhancers”). In its state of the art analyses concerning HET, the project focused on cognitive enhancement (pharmacological cognitive enhancement, in particular) and on physical enhancement, although to a certain extent it also took into account so-called “mood enhancement”.

Pharmacological cognitive enhancement (PCE) is an area in which non-therapeutic enhancements are widely discussed. It has already received considerable attention in both academic and policy discourse on human enhancement and its ethical and societal implications, as well as (in some countries) in the mass media. Although there is extensive literature on ethical, legal and societal aspects (ELSA) of PCE, there is very scant empirical evidence of the effectiveness of these substances in healthy individuals. There are major obstacles to assessing the current state of the art in this area due to the lack of data relating to such use of these substances and other aspects. Early discourse on PCE focused

on ethical issues and future uses of drugs that do not as yet exist and thus to a large extent contributed only to what has been termed “speculative ethics” (Nordmann 2007; Nordmann/Rip 2009). While this highly speculative discourse continues, scientists, psychiatrists, other medical experts, philosophers, social scientists, science journalists and researchers in the field of technology assessment have at the same time been drawing attention to and taking issue with the problematic features of discourse on PCE (see, for example, Lucke et al. 2011; Quednow 2011). In line with and in parallel to these criticisms, the EPOCH analyses of the state of the art in PCE came to the following conclusions:

- There is no evidence in the literature that any substance can enable a person to develop extraordinary (or superhuman) capabilities.
- In the existing literature it is not clear whether some substances could allow a person to increase their particular cognitive ability beyond his/her own optimal level (i.e. when not suffering stress, repetitive conditions or sleep deprivation).
- There is growing evidence that it is not scientifically sound to speak of “cognitive enhancers” for healthy individuals: if a substance can be proved to have an enhancing effect, this effect is always on a particular property of cognition, and is often differently interrelated with changes in other properties (which can also be detrimental).
- Comparative studies of different substances have found that each substance may produce different advantages (if they produce any at all) depending on the cognitive demands of the task.
- Caffeine (600 mg), dextroamphetamine (20 mg) and modafinil (400 mg) have an equal effect on objective alertness and simple psychomotor performance for approximately two to four hours, although the side-effects and addiction potential of those substances vary substantially.
- Stimulants sometimes have a placebo effect: the mere expectation of receiving a stimulant can raise subjective arousal.

Doubts have also been expressed concerning the extent to which these substances are actually used and regarding their potential attractiveness for broader parts of the population. It is no wonder then that the Office of Technology Assessment at the German Parliament (TAB), after its own major study on PCE (Sauter/Gerlinger 2012), has concluded that the hype surrounding PCE has been “demystified”. The TAB also pointed out that potential pro-PCE policies face very considerable hurdles. There is obviously a trend towards challenging central assumptions about the efficacy of the drugs in question and the societal relevance of their use which were widely held in early discourse on PCE. Highly speculative ethical discourse in particular has been strongly criticised since 2011.

“Neurotechnological enhancement” (NCE) – which according to the definitions proposed by EPOCH encompasses not only all kinds of neurotechnological implants, but also those stimulation technologies which do not require surgery – has to date been almost completely therapeutic. Given its main applications in therapies, it appears almost frivolous to speculate on the non-therapeutic use of such technologies to enhance the performance of people without serious health problems. The body-external brain stimulation technologies that appear to be most relevant in the context of non-therapeutic applications are transcranial magnetic stimulation (TMS) and transcranial direct current stimulation (TDCS). While some of the technologies are only efficient when applied during sleep, others can be used during learning. Enhancing effects of such stimulation technologies that have been observed so far have only been transient improvements, however. Brain-computer interfaces (BCI), which can be implanted or used in body-external devices, do not stimulate the brain but use neural signals as input for purposes such as the control of machines. BCI technologies are therefore not cognitive enhancers according to the definition proposed by EPOCH, but they are important in this context since they appear to herald a new quality in human-machine interaction and can improve human performance significantly and in a way similar to the visions of human enhancement. The most important conclusion in this con-

text appears to be that the topic of NCE should be scrutinised in much the same way as PCE was, trying to help avoid another hype (which in the case of the hype around PCE might have contributed to the popularisation of useless and potentially or actually harmful drugs).

The fact that neuro- and bio-technologies, BCIs and various other bio-signal based technologies, advances in limb prosthetics and robotics and other technoscientific fields appear to herald a massive and societally relevant change in the interrelations between humans and technology should not be overlooked or underestimated, however. It may well be the case that discourse on “human enhancement” will turn out to be just an early and strangely ideological harbinger of things to come.

### **3 The Role of Ethics in Governance Activities on Human Enhancement**

The EPOCH project also produced an overview of existing policies and governance activities on selected enhancement issues and analysed how ethical issues are taken into account in these activities, focusing on activities on cognitive enhancement and on activities dealing with “human enhancement” (plus a separate work package on doping in sports) and on Europe. The collection of information on governance activities was largely restricted to documents and activities which explicitly refer to discourse on and the notion of “enhancement”. In general, the EPOCH project used a very broad notion of “governance”; this notion is also used in order to take into account well-known changes that have taken place in the science system and in research policies in the last two decades. The EPOCH project focused, however, on the interface between policy and academic spheres and, in particular, on policy advice regarding ethically controversial NEST. Accordingly, EPOCH research on the governance of human enhancement concentrated on (1) policy activities in the narrow sense (such as parliamentary activities), (2) activities of institutions that regularly give advice to policy makers, (3) activities of publicly funded institutions or other public bodies that play an important role within the science system (e.g. academies of sci-

ence) or political system, (4) all kinds of publicly funded “accompanying research” activities which explicitly deal with the topic of human enhancement and are conducted in such fields as technology assessment and studies on ELSA of relevant NEST, and (5) publicly funded “public dialogue” activities. Other activities were only taken into account if core actors in the political system or science system participated in them or if they were directly funded by political institutions or by institutions of policy advice. The focal countries in these analyses were Croatia, Denmark, France, Germany, Italy, Netherlands, Norway, Poland, Serbia, Slovenia, Spain, Switzerland and the United Kingdom. Activities in other European countries were not systematically taken into account. This selection of countries had the goal of supporting Pan-European reflection on the role of ethics in science and technology governance and policy making and on the topic of human enhancement.

The analyses showed that the selected countries can be roughly divided into two groups: a group of countries in which a large number of activities or high-profile activities are taking place (Denmark, Germany, the Netherlands, Norway, the United Kingdom and Switzerland), and a group of countries in which there is lively academic discourse but governance activities are rare or non-existent, or in which both academic discussions and governance activities are very rare or non-existent (Croatia, France, Italy, Poland, Serbia, Slovenia and Spain). Ethical aspects play a major role in a large number of activities on human enhancement. Policy activities in the narrow sense (such as parliamentary activities) are very rare. A few parliamentary committees have dealt with the topic, mainly in the context of technology assessment, foresight or ELSA research activities or in connection with doping policies. It is therefore much too early to identify trends in governance activities on this topic in Europe.

As mentioned above, academic discourse on cognitive enhancement has changed significantly very recently – shifting from highly speculative discussions to a more evidence-based discourse – but this has only rarely been taken into account by governance activities so far. Although some

new publications by policy advisory institutions reflect this shift (see, for example, Eckhardt et al. 2011; Sauter/Gerlinger 2012), it would be premature to define this as a new trend. The same holds true for the apparent, related shift in academic discourse on cognitive enhancement from pharmacological to neurotechnological means of enhancement. Again, we find some new publications by policy advisory institutions here that appear to reflect this shift, yet it is also still too early to say whether this constitutes a trend. An interesting trend might be constituted by the fact that the enhancement of military performance is pursued to some degree in Europe. In early discourse explicitly focused on human enhancement (in the first half of the 2000s), it was often pointed out that U.S. military research plays an important role in discussions and other activities on human enhancement and that military enhancement is an irrelevant topic in Europe. In the meantime, however, a small number of activities on this topic have been taking place in the EU, though largely in the form of “preparatory” ELSA and foresight research.

If we look at how reports by policy advisory institutions (such as national ethics councils or technology assessment offices) in the selected countries have related and contributed to ethical discourse, we can observe, amongst other things, the following:

- The lack of a universally accepted definition of the term enhancement and the problematic distinction between enhancement and therapy are perceived as a major challenge for the ethical debate in the majority of documents on this topic.
- The question of what human nature is, that is to say the anthropology beyond technological development, is discussed as a central ethical issue, and the discussion is characterised by a polarisation of positions between radical promoters of the creation of biologically and technologically superior human beings on the one hand, and those on the other hand who stress that nature and character are morally valuable categories and rely on concepts such as finitude and humility.
- The anthropological aspects of the significance of humankind and its relationships with

technologies concern not only the individual but also the societal level.

- There is a discussion of the role of intuitions in the ethical arguments
- Broader societal processes, such as changes in the health system, are relevant to the topic of human enhancement.

Since enhancement is a complex, multifaceted phenomenon, speculation about what these technologies could do in future and which kind of ethical issues we will be confronted with play a major role in the governance debate. In this respect we can identify two major trends: on the one hand, the reference to the future and to visions of increasing human performance by technological means is seen as a possible future scenario and is analysed by means of foresight. On the other hand, although a lack of evidence of efficacy or a lack of empirical studies of certain effects of some technologies is stated, the discussion of the ethical issues as well as the formulation of governance recommendations is still often framed by the idea that these technologies will be developed sooner or later and will thus become a concrete and urgent issue needing to be faced.

One of the major challenges for the governance of ethically controversial NEST is posed by the fact that different ethical values co-exist, with the result that a technology may be differently evaluated in society. Ethical pluralism is not explicitly addressed as a theoretical problem in institutional reports, but is implicitly taken into consideration in the formulation of policy recommendations. In this respect we can identify three major trends in the way the reports analysed in EPOCH have issued policy and governance recommendations:

1. In some cases, policy recommendations opt clearly for a particular type of regulation.
2. In other cases, the presence of different ethical views is openly declared and different governance frameworks (or different recommendations) are formulated.
3. In yet other cases, some reports list different ethical arguments, acknowledge the possibility of different regulatory frameworks and conclude with open questions which should

be addressed in order to clarify political decisions.

It is interesting to note that recommendations are often presented in the form of alternative routes of action tied to specific ethico-political approaches or stances. This fact can be interpreted as a further sign of cultural diversity in Europe with regard to the topic of enhancement. This diversity is not restricted to differences between national cultures but encompasses cultural differences within countries. It also indicates that practices and visions of human enhancement are raising challenges that are related to unresolved questions in Europe's common cultural and political history (for example with regard to the legacies of Western and Russian utopianism and of eugenics). What significance this has for the role of ethics in governance activities on human enhancement issues is a topic that deserves further scrutiny in the future.

#### 4 Outlook

In this article, we have only presented a relatively small selection of EPOCH project results, focusing on research done or led by ITAS. The project has, however, successfully combined its various thematic strands, both in analyses and in workshops, conferences and meetings. Besides a number of recommendations for the governance of human enhancement and for doping in sports, a major outcome of the project will be recommendations for policy makers and stakeholder groups concerning how to help improve policy advice on ethically controversial NEST in Europe.<sup>1</sup> The main challenges in the latter regard appear to include how to intensify and improve the exchange of information and ideas within Europe and how to foster interdisciplinary, multi-stakeholder and public deliberations in this area.

#### Note

- 1) These recommendations – as well as several workshop and other reports and outputs of the project – will be published in the coming months on the EPOCH project website (<http://epochproject.com/>) and on the ITAS website (<http://www.itas.kit.edu>).

Various recent and forthcoming academic publications also present results of the EPOCH project (e.g. Ferrari et al. 2012; Mali et al. 2012).

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*Websites and online publications:* *iRobot Corporation*, 2011: *One Robot, Unlimited Possibilities*. iRobot 510 PackBot. Bedford, MA; [http://www.irobot.com/gi/filelibrary/pdfs/robots/iRobot\\_510\\_PackBot.pdf](http://www.irobot.com/gi/filelibrary/pdfs/robots/iRobot_510_PackBot.pdf) (download 30.3.11)

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