DIRECTORATE GENERAL FOR INTERNAL POLICIES

POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

SCIENCE AND TECHNOLOGY OPTIONS ASSESSMENT (STOA)

HUMAN ENHANCEMENT STUDY

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IP/A/STOA/FWC/2005-28/SC35,41&45, MAY 2009

Presentation of the Study at the

Workshop "Human Enhancement: The Ethical Issues"

(*STOA*, in cooperation with the *Conference of European Churches / CEC*, Church & Society Commission, and the FP7 *ETHENTECH* project),

European Parliament, Brussels, 26 April 2012

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Outline of the Presentation

- **Brief information about the project**
- **Overview of the state of the art in human enhancement technologies (HET)**
- **Brief remarks on Christian contributions to discourse on human enhancement**

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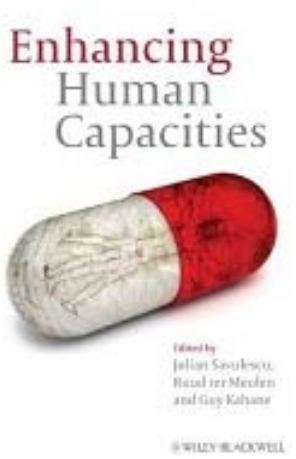
The STOA Project "Human Enhancement" (1)

- **Duration: 2008-2009**
- **Carried out by the *ETAG* (European Technology Assessment Group) members *ITAS* (i.e. KIT's Institute for Technology Assessment and Systems Analysis), Germany, and *Rathenau Institute*, the Netherlands**
- **A book chapter on the main results concerning the political implications of HET has been published in Savulescu, ter Meulen & Kahane (eds), *Enhancing Human Capacities*, Wiley-Blackwell (2011)**
- **The involvement of ITAS in the STOA project has been a decisive factor in acquiring the ongoing FP7 project *EPOCH* (2010-2012), which focuses on ethical aspects of human enhancement**



epoch*

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The STOA Project "Human Enhancement" (2)

- *Definition* of 'human enhancement': "*any modification aimed at improving individual human performance and brought about by science-based or technology-based interventions in the human body*"
- *Distinction* between (i) *non-enhancing* interventions (restorative or preventive), (ii) *therapeutic enhancements*, and (iii) *non-therapeutic enhancements*
- Four in-depth *case studies* (gene therapy and gene doping; designer babies; Ritalin; deep brain stimulation, DBS)
- Discourse on human enhancement to be seen in *broader societal contexts and trends* such as the medicalisation of social problems, the commercialisation of medicine, and the growing competitive pressure
- Several *expert meetings* and a *literature study on the state of the art in selected areas of HET* (->continued in EPOCH, together with Arianna Ferrari and other KIT-ITAS staff)

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The State of the Art in HET (1)

Cognitive enhancement ("brain doping"):

Pharmacological cognitive enhancement (PCE)

->evidence of effective non-therapeutic PCE is scarce, and sometimes contradictory; almost without exception, PCE is only effective in the case of decreased conditions such as sleep deprivation or stress; caffeine has at least an equal effect on alertness as the drugs most discussed in the debate on PCE

->some argue that it is not at all scientifically sound to speak of PCE of healthy individuals; others argue that non-therapeutic PCE could become more effective as a side-effect of the growing R&D into medication for neurodegenerative diseases.

->there is only *scarce evidence of both the efficacy of non-therapeutic cognitive enhancers and their societal relevance* in terms of actual use, potential demand and public acceptance.

Neuro-stimulation technologies: while deep brain stimulation (DBS), which is often mentioned in discourse on human enhancement, is only used for therapeutic purposes, transcranial magnetic stimulation (TMS) and transcranial direct current stimulation (TDCS) have shown potential for use as non-therapeutic cognitive enhancers -> *risk of a new hype and unfounded claims*

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The State of the Art in HET (2)

Physical enhancement:

- Extremely broad spectrum of R&D
- Visionary discourse on physical enhancement evokes popular images of supermen and superwomen with physical capabilities far beyond the limits of human corporeality, including abilities which no human being has ever had before.
- Centrality of the notion of ‘cyborgs’, beings in which humans and technology have a much closer relationship and even merge.
- At the same time, there are already significant societal applications for various means of physical enhancement. Although many are only therapeutic, taken together they constitute a kind of testing ground for non-therapeutic physical enhancement.
- Certain surgical interventions for non-therapeutic purposes are already widespread (cosmetic surgery, piercing) or are being experimented with inside academia (Kevin Warwick) and outside (by several artists or in body modification subcultures).

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The State of the Art in HET (3)

- **While non-therapeutic cognitive enhancement technologies can at best be described as being in their infancy, *technologies that can improve physical performance* are either exclusively used for therapeutic purposes (the major exceptions being doping in sports, cosmetic surgery and the non-therapeutic use of Viagra), or do not meet our definition of HET (since they are not fixed to the body)**
- **Nevertheless, these technologies deserve attention since some of them (as well as the neuro-stimulation technologies used for cognitive enhancement) appear to signal radical shifts in the relationship between humans and technology**
- **These technologies, which have the *potential to evolve into radical, second-stage HET*, include BCIs and other bio-signal-based technologies, high-tech limb prostheses, exoskeletons, gene therapy and gene doping, and potential means of combatting ageing processes**
- **In the fields of cognitive control of external devices, "augmented cognition" and non-invasive assistive neuro-technologies, some aspects of the technological *developments veer towards a new quality of man-machine interaction* insofar as the machines are directly interacting with the brain, or an "augmented reality" is created in which virtual and physical surroundings are blended – and this is all the more true for implants and prostheses.**

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The State of the Art in HET (4): Policy Options

- Against the background sketched out so far, the STOA study argues that neither a laissez-faire approach nor a total ban of HET is viable in an EU policy context, which leaves us with *(1) a reasoned pro-enhancement approach, (2) a reasoned restrictive approach, or (3) a case-by-case approach as viable policy options*
- Given that HET, even if in their infancy, are posing challenges to health policies and other policy fields and that some of them herald major changes in our interrelations with technology, the STOA study argues for the establishment of a *temporary European body within or closely related to the European Parliament*
- This *temporary body could develop a normative framework*, based on fundamental and uncontroversial values such as autonomy, fairness and the right to physical integrity, *and would help to* (1) organise a comprehensive *impact assessment* of HET, (2) identify *further research* needs, (3) *define the limits within which each country can regulate* HET, (4) *prevent undesirable effects and inner-European inequalities*, (5) *inform funding policy committees*, and (6) prompt a *broader dialogue on the topic* as a whole

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Christian Contributions to Discourse on Human Enhancement

- Christian authors have contributed to visionary discourse on human enhancement, often at a very early stage (e.g. in the debate in the 1990s on Frank Tipler's visions of the far future), and to its critique (e.g. by characterising transhumanism and other radical pro-enhancement worldviews as pseudo-eschatological); discourse on human enhancement or HET themselves are often seen as challenges to Christian anthropology and eschatology; core themes are the Imago Dei, immortality and resurrection, the mind-body dualism, the legacy of Gnosticism, and the role of humans and of technology in creation and eschatology (contributions by Benedict XVI, Bishop W. Huber, W. Pannenberg, E. Graham, T. Peters…)
- Christian and other religious voices are often seen, particularly in the U.S., as antipodes to transhumanists and other promoters of radical HET

->future perspectives and 'second-stage enhancements' ("self-aware evolution" and "human–machine hybrids": "humanity 2.0"); challenges to our views of society and what it means to be human; science and technology as *ersatzreligion*?; relevance of HET to European value systems and cultural traditions (religious and secular)?

Two questions following from or raised in the STOA study:

->Is discourse on human enhancement dependent on certain religious traditions?

->What can religious voices contribute to the discussion and societal handling of the more "mundane" and urgent challenges raised by HET and with regard to their political implications? (contributions by D. Bruce, L. Kass, N. Knoepffler, U. Körtner…)

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Thank you very much for your attention!

Study:
http://www.europarl.europa.eu/stoa/publications/studies/stoa2007-13_en.pdf

STOA (Science and Technology Options Assessment) Panel of the European Parliament:
http://www.europarl.europa.eu/stoa/

ETAG (European Technology Assessment Group):
http://www.itas.kit.edu/english/etag.php

ITAS (Institute for Technology Assessment and Systems Analysis) within Karlsruhe Institute of Technology (KIT): http://www.itas.kit.edu/english/index.php

Rathenau Institute: http://www.rathenau.nl/

We would like to express our sincere thanks to Ria Oomen-Ruijten MEP, Dorette Corbey MEP and Theodoros Karapiperis (responsible administrator).

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