

# THE ETHICS OF COGNITIVE ENHANCEMENT

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# Objective:

- *Not* to say which cognitive enhancements, undertaken by which means, in which circumstances would be ethically permissible
- To articulate how to think about the ethics of enhancement—how to frame the issues

# I. What is enhancement?

- To enhance is to increase, improve, augment
- CE, cognitive enhancement: improvement of our cognitive capacities (memory, attention, reasoning, belief-formation, understanding, organization of information, etc.)

# Enhancing 'normal' cognition?

- Improvements within the (current) normal range
- Raising the upper bounds of the (current) normal range

# How much enhancement to expect?

- Pharm. CEs haven't yet raised the upper limit of (current) normal cognitive function.
- This may well change.
- Even if it doesn't, there still might be *large* social effects, including the raising of the upper limit of *collective* cognitive capacity

# Individual versus Collective Cognition

*Collective* cognition occurs when information distributed across many individuals is organized into knowledge, etc.—e.g., science as an institution—i.e., when individuals are connected to one another in ways that facilitate cognitive products none could achieve independently.

If the cognitive capacities of large numbers of individuals were increased, this might raise the upper bound of our current *collective* cognitive capacity, even if all the individual enhancements were within the (current) normal range.

# More generally---

- Relatively modest gains\* in individual cognitive capacity may have large social effects—e.g., by increasing productivity, by facilitating new kinds of social relationships, new institutions, new technologies, etc.

\*On some estimates, current cognitive enhancement drugs produce improvements in the range of 10-20%, with greatest improvement at the lower end of the normal range.

# How CE Could Improve Human Well-Being

- By facilitating the development of well-being enhancing technologies (cures for cancer, ways of coping with global climate change, etc.)
- By increasing productive efficiency (and thereby making new gains in well-being possible)\*
- By enabling people to make better choices, form better beliefs (we generally think this is a good thing!)
- By increasing enjoyments intrinsic to cognitive success (goods dependent on more sophisticated cognition)
- By reducing accidents and other losses of well-being that result from inattentiveness, errors of judgment, etc.

\*Historically, large gains in well-being have been conditioned by increases in productivity, though increased productivity by no means guarantees increased well-being.

# Some Mundane Examples of the Cost of Poor Memory and Lack of Alertness\*

- In UK, cost of lost keys = 500 million pounds per year
- In UK, 15-20% of traffic deaths due to sleepiness (lack of alertness, due to lack of sleep)

\*Anders Sandberg, "The Economics of Cognitive Enhancement" (2006).

## II. *Modes* of CE now most discussed

- Pharmaceutical
- Brain/computer direct interface (implantation of electrodes in brain, etc.)
- Brain tissue implants
- Transcranial magnetic stimulation (TMS)
- Genetic interventions (insertion and/or deletion of genes in embryos or zygotes)\*

\*Has already produced CE in mice.

# CURRENT EXAMPLES: PHARMACEUTICAL CEs

(improved long-term memory, or working memory, or executive function)

- Ritalin
- Modafinil
- Hormones (e.g., **Pregnenolone**)
- Nutrients
- Cholinergic agonists
- Piracetam family
- Ampakines
- Consolidation enhancers

### III. How not to think about CE (or enhancement generally)

- *As something new* (literacy, numeracy, computers, institutionalized scientific method, memory training, education, caffeine and nicotine consumption, better perinatal nutrition—are all cognitive enhancements
- *As exclusively or even primarily a competitive, zero-sum, or positional good*

(CEs will have positive spill-over effects, will exhibit network effects, will not be purely positional goods)

# Ex.: better working memory

- Has value independently of whether others don't have it (is *not* a pure positional good, like height in a basketball game)
- Exhibits network effects: value of your better working memory to you increases as more other people get better working memory
- If better working memory enables more complex activities, productivity may increase, and increased productivity can bring other benefits—gains in well-being

# How Not to Think of CEs, cont'd

- *As purely a matter of individual choice, as private goods* (with respect to CEs that have the potential to improve social welfare, e.g., by increasing productivity, reduce low socio-economic performance, etc., the State may take an interest in subsidizing their development and utilization

# How not to think about CEs, cont'd

- *As (merely or primarily) an example of the (supposedly unseemly) “quest for perfection”\**—the point is not to be perfect, but to be better at doing things that we already value and already try to improve.

\*Michael Sandel, “Against Perfection”

# How Not to think of CEs, cont'd

- *As (exclusively) worsening existing social and economic inequalities*

Whether CEs will worsen or lessen inequalities will depend on several factors:

# Worsening or lessening inequalities, cont'd

- How expensive they are (cup of coffee versus brain surgery; pharm. Interventions are likely to not be expensive in the long run, when patents expire (much cheaper than education!))
- Whether the State takes an interest in their development and utilization (cf. education)
- Whether they tend to work best to improve the worse off (raise the cogn. capacity of those at the lower end of the normal distribution)

# IV. Enhancement and Evolution

- Biomedical enhancements, including CEs, may be needed to help us cope with our current environment, which itself has been shaped (or misshaped) by our previous cognitive enhancements.

Cognitive capacities shaped by the ancestral environment in the Pleistocene may not be adequate—  
--to utilize ‘external’ external cognitive enhancements we are developing (e.g., to interface adequately with complex information technologies)  
--or even to survive

# Some Advantages of (Deliberate) Enhancement Over (Biol.) Evolution

- *It's a lot faster!* It is often remarked that cultural evolution has the advantage of being much more rapid than biological evolution; the same may true in spades of biomedical enhancements
- *In principle, it's a lot less bloody!* Natural selection is very costly, works through ruthless competition; biomedical enhancement need not.
- *It's potentially a lot more versatile!* Evolution is constrained by the availability of genetic material ***within a particular lineage***; biomedical enhancement can utilize genes from many species, artificial chromosomes, and synthetic biology techniques

# But what about 'The Wisdom of Evolution'?

- Evolution isn't wise (or dumb); that's sheer anthropomorphism; it is—from the standpoint of humane values—often wasteful, violent, grossly inefficient, and slow.
- The fact that we have a particular trait does not mean that it is even optimal from the standpoint of *biological fitness*, much less that it is optimal from the standpoint of our values

--all it means is that the trait was adaptive (conducive to biological fitness) at some earlier point or happens to be linked to some trait that was adaptive.

- Not 'interfering with evolution' doesn't guarantee our survival; just the opposite, since all species become extinct when evolutionary forces operate without 'interference'.

# The (big) Grain of Truth in Talk About the Wisdom of Evolution

- Evolution produces organisms and organisms are *systems*—complex interdependencies that interact with each other and their environment in complex ways.
- So, there is a real danger that we will do something that we think will be an improvement (and which may be a ‘local’ improvement), but which will disrupt benign interdependencies of which we are ignorant.

# So...

- We need to be cautious, taking into account the risk of unwitting disruption of benign interdependencies.
- This doesn't mean we should abstain from enhancements—it means we should go slowly, on a small scale, with changes that are reversible or at least containable.

# In the Case of Pharmaceutical Cognitive Enhancements...

- We may need to modify current safety regulations for drug development, testing, approval, marketing, and post-approval surveillance (using pharmacogenomics), but we won't be starting from scratch.
- It isn't clear that these changes are needed peculiarly for enhancement pharmaceuticals!

# A Final Thought...

- Progress in memory enhancement may raise a number of ethical issues aside from ordinary safety issues—in particular, issues concerning *the ethics of memory management* .

--The U.S. military is already trying to manage the memory of combat soldiers (to reduce PTSD—or also to create remorseless warriors?)

# Memory

## Enhancement/Management, cont'd

- Memory is important to personal identity and greater control over memory will mean greater control over personal identity...more choices about what sort of person we should be.
- If greater control over memory is combined with extended life, the ethics of memory management will become even more complex.