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Human enhancement: is it good for society?

A team of international scientists has been investigating new technologies that enhance the physical and cognitive skills of human beings, as well as their development and distribution in society. The need to put an appropriate framework in place is becoming increasingly urgent.

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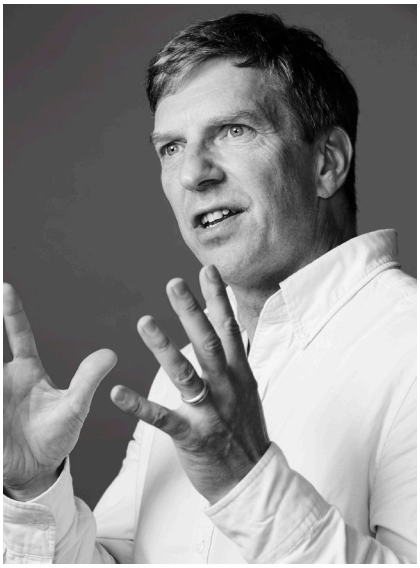
Human enhancement technologies are opening up tremendous new possibilities. But they're also raising important questions about what it means to be human, and what is good or bad for our individual and collective well-being. These technologies are currently geared towards upgrading or restoring physical and psychological abilities for medical purposes. An application is surfacing, however, that is designed with another goal in mind: embellishing performance. Although using this technology is very much an individual choice, it nevertheless has an impact on society as a whole. An international team of researchers headed by the University of Geneva (UNIGE), Switzerland, and Oxford University has been examining the ethical issues arising from these experiments. The research, published in *Nature Human Behaviour*, questions and highlights the conflict between individual and collective well-being, together with the important role governments have to play.

Today's new human enhancement technologies are mainly used restoratively following an accident, illness or handicap of birth. A recent **US study** led by Debra Whitman (published in Scientific American) has shown that these restorative technologies receive near-universal approval from the general public: 95% of respondents support physical restorative applications and 88% cognitive restorative applications. This percentage drops to 35%, however, when the subject turns to interventions intended to upgrade a physical or cognitive ability with the sole aim of boosting performance. Why? "Because you're touching on the very essence of humankind, and that raises an avalanche of ethical questions," says Daphné Bavelier, professor in the Psychology Section in UNIGE's Faculty of Psychology and Educational Sciences (FPSE). An international team of researchers, mandated by the World Economic Forum (WEF), has been looking into the factors that need to be taken into consideration to ensure a fair society and collective well-being when developing and distributing these new human improvement technologies.

Well-being is seen in terms of independence, competence and social relations

Although well-being is often reduced to economic indices, it actually goes beyond the idea of money once primary needs have been met. The theory of self-determination divides well-being into three parts: autonomy – the ability to make one's own decisions; competence – the capacity to act and contribute to society; and social relations – the network of relationships that we can count on. "We probed the individual and collective impact of human augmentation technologies based on these three components, the aim being to alert governments to the possible abuses involved in the unrestricted use of these scientific advances," says Julian Savulescu, professor at the Centre for Practical Ethics at Oxford University.

Autonomy is making one's own informed decision about how to lead one's life, without being coerced by another person. It follows that an individual may choose whether or not to upgrade his or her faculties. "But, suggests professor Bavelier, that can quickly lead to certain aberrations. If a military pilot has their eyesight enhanced, it's possible that this improved visual acuity may become obligatory to do the job. So, someone who wants to be-



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Julian Savulescu, professor at the Centre for Practical Ethics at Oxford University.

High resolution pictures

come a pilot but doesn't want to be operated on would automatically be eliminated from the profession." Take another example: "If parents were able to choose certain traits for their baby, such as muscle strength, eye color or intelligence, this could have a severe impact on human diversity", says Simone Schürle, a professor in the Department of Health Sciences and Technology at ETH Zurich. "Certain trends might favour particular traits, while others might disappear, and that would tend to reduce genetic variability." And yet, each set of parents would only be choosing traits of a single baby. "Each individual modification has consequences for society," points out professor Bavelier.

The same applies to competence. What will happen if some people have the resources to buy new skills while others do not? How will companies manage to stay competitive if these advantages become a bargaining tool? How will we be able to compete against someone who has been enhanced? "Doping in sport is an excellent example of how individual enhancement impacts on the collective," argues professor Savulescu. "When an athlete takes a substance that improves their results, they push others to imitate them for the sake of performance. To be competitive, individuals are no longer free to say no to performance enhancement. This requires new approaches. Perhaps the key question is not about the effectiveness of the regulations, but rather about a new transparency that would allow everyone to take enhancements or refuse, but to be open about it and to factor use into the results."

The steady increase in the use of drugs with the aim of facilitating social relations underlines the importance of this aspect in human well-being. Although new technologies are beginning to develop in this field, their use raises genuine ethical questions at the collective level. "We can already reverse relationships based on domination in mice by stimulating specific parts of the brain," says professor Bavelier. "Influencing someone else's behaviour – by eliminating the feeling of loneliness often linked to depression, for instance – is within reach." Every good idea, however, has a downside, as demonstrated by the sad trepanning experiences of the twentieth century that were supposed to cure female hysteria. Removing a behavioural problem does not solve it. "A study that reinforced people's empathy in order to eradicate racism showed that individuals in the same group were more united through empathy – but that their rejection of other groups rose dramatically," continues professor Savulescu. What works for one individual does not have the same effect on a group as a whole.

Following their comprehensive investigations, the international team – consisting of geneticists, ethicists, philosophers, engineers and neuroscientists – recognised the importance of thinking through the consequences on society of each individual change. The experts also reported the urgent need to introduce unified regulations among different governments before the use of these new technologies degenerates. This concern is illustrated by the recent case of Chinese twins who were genetically modified to resist the AIDS virus – a disease that they might well never have contracted. "One of the great unresolved ethical enigmas is how to reconcile the interests of the individual and those of society in the event of conflict. Human improvement technologies require policy makers to find a certain balance. Collective effects are important and we can't just let the market decide," says Julian Savulescu. "Our remarks are a call to action before it's too late," concludes professor Bavelier.

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