

Table of Contents

Table of Contents	1
1. Introduction	3
2. Human Enhancement Technologies	8
2.1 Defining Human Enhancement and Human Enhancement Technologies	8
2.1.1 Therapy and Enhancement	9
2.1.2 Enhancement, Technoscience and Nature/Nurture	12
2.1.3 Our Definitions and the Further Aims of the Study	14
2.2 Progress and Prospects of Non-Therapeutic Enhancements	16
2.2.1 Cognition and Perception	17
2.2.2 Motor Skills and Strength	23
2.2.3 Conclusion	26
3. Human Enhancement, Society & Culture: Toward an Enhancement Society	28
3.1 Heated Discussions, Far-Ranging Visions, and Societal Tendencies	29
3.1.1 The Concerns of Dehumanisation and Moral Decline	30
3.1.2 Concerns Regarding the Political Abuse of Enhancement Technologies	31
3.1.3 Belief in Technological Fixes	32
3.1.4 Questioning the Hype and the Trends Toward an Enhancement Society	33
3.2 Broader Societal Tendencies and Issues	36
3.2.1 Globalisation	36
3.2.2 Popular Views of Human Enhancement	38
3.2.3 Religion and Cultural Differences	40
3.2.4 Changes in Concepts and Systems of Health Care	45
3.2.5 Disability, Human Enhancement, and Environmental Challenges	48
3.3 Pushing Boundaries with Genetic Therapies and Doping?	51
3.3.1 Gene Therapy, Genetic Enhancement and Gene Doping	51
3.3.2 Introduction of Gene Doping: Concerns and Consequences	53
3.3.3 Obstinate Questions and Issues	57
3.4 The Case of Designer Babies	58
3.4.1 It's a Fantasy: the Dream of the Perfect Child	58
3.4.2 It is a Reality: the Saviour Baby, Cosmetic Baby and Disability Baby	60
3.4.3 Status Quo of PGD: the Technique and its Demand	62
3.4.4 Main Social and Ethical Worries on PGD	63
3.4.5 Regulatory Arrangements on PGD	65
3.4.6 Conclusion	65
3.5 Better Performing Students and Employees with Ritalin?	66
3.5.1 The Success Story of Ritalin	67
3.5.2 Ongoing Controversies	68

3.5.3	Remaining Issues of Concern	72
3.6	Deep Brain Stimulation: Push-Button Mood Control?	72
3.6.1.	Deep Brain Stimulation and its Applications: State-of-the-Art.....	72
3.6.2.	Promises of the Present and Images of the Past.....	73
3.6.3	Concerns and Consequences.....	74
3.6.4	Conclusion	76
3.7	One Trend Instead of Four Separate Cases.....	77
3.7.1	New Practices Arise from Cutting-Edge Science	77
3.7.2	Sufficiently Regulated New Practices?.....	78
3.8	The Promotion of Human Enhancement.....	79
3.8.1	Organised Transhumanists, Their Mentors and Milieus.....	80
3.8.2	Science Communication and the Ethics of Technology	82
3.8.3	Policy Activities on Converging Technologies	87
3.7.4	Industry and Investors.....	89
3.8.5	Military and Space Research	90
3.8.6	The Ideology of Extreme Progress	92
3.9	Enhancement of Individuals, Social Progress, and European Cultural Values	94
4.	The Governance of Human Enhancement and the European Union	97
4.1	The European Debate on Human Enhancement	97
4.1.1	Nanotechnology, Converging Technologies and Human Enhancement	98
4.1.2	The European Groups on Ethics in Science and New Technologies.....	103
4.1.3	Other Relevant EU-Funded Projects.....	105
4.1.4	Conclusions.....	106
4.2	Selected EU-Funded Research and Development Projects	107
4.3	Challenges to Existing Normative Frameworks	110
4.4	Legal and Regulatory Aspects of Human Enhancement	114
4.5	First Steps toward the Governance of Human Enhancement	120
5.	Policy Options on Human Enhancement for the European Union	122
6.1	Which domains are particularly challenged by human enhancement trends?	123
6.2	Developing a normative framework	124
6.3	A European Body on the Issue of Human Enhancement Technologies	128
6.	References	131
7.	Appendices.....	147
7.1	The Expert Meetings.....	147
7.2	The STOA Workshop in the European Parliament on Human Enhancement	165